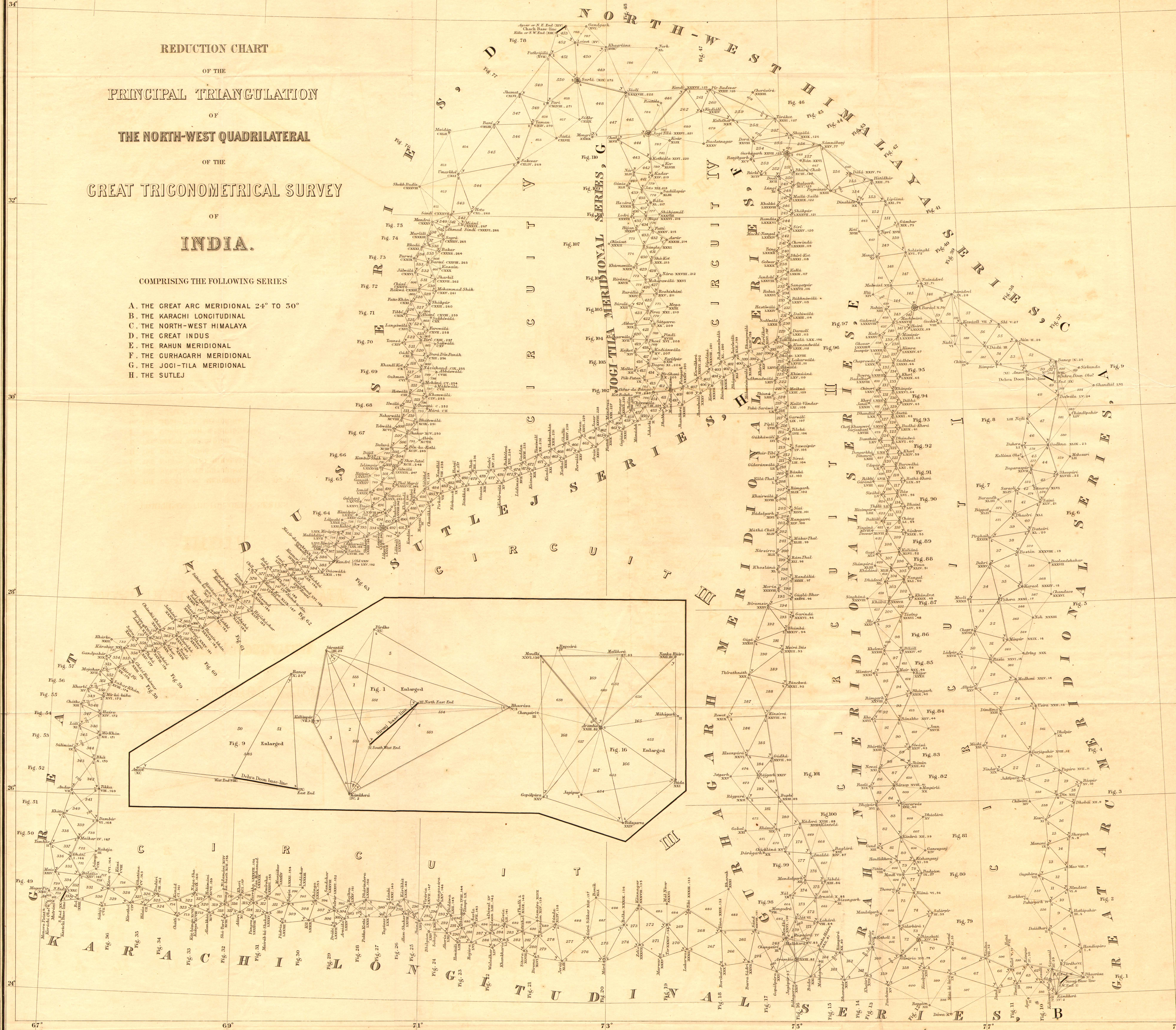




REDUCTION CHART OF THE PRINCIPAL TRIANGULATION OF THE NORTH-WEST QUADRILATERAL OF THE GREAT TRIGONOMETRICAL SURVEY OF INDIA.

COMPRISING THE FOLLOWING SERIES

- A. THE GREAT ARC MERIDIONAL 24° TO 30°
B. THE KARACHI LONGITUDINAL
C. THE NORTH-WEST HIMALAYA
D. THE GREAT INDUS
E. THE RAHUN MERIDIONAL
F. THE GURHAGARH MERIDIONAL
G. THE JOGI-TILA MERIDIONAL
H. THE SUTLEJ



16443

ACCOUNT OF THE OPERATIONS OF  
**GREAT TRIGONOMETRICAL SURVEY OF INDIA**  
VOLUME III.

THE PRINCIPAL TRIANGULATION



THE BASE-LINE FIGURES,  
THE KARACHI LONGITUDINAL, N. W. HIMALAYA,  
AND GREAT INDUS SERIES  
OF THE  
NORTH-WEST QUADRILATERAL.

BY COLONEL J. T. WALKER, R.E., F.R.S., &c., &c.,  
SUPERINTENDENT OF THE SURVEY  
AND HIS ASSISTANTS.



**Dehra Doon:**

PRINTED AT THE OFFICE OF THE GREAT TRIGONOMETRICAL SURVEY OF INDIA.

M. J. O'CONNOR.

1873.

*(Issued in 1879)*



# PRINCIPAL TRIANGULATION.

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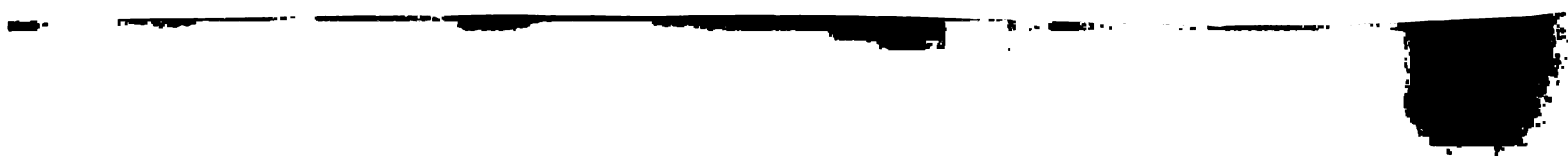
ORTHOGRAPHY USED.		CORRECT ORTHOGRAPHY.		MEANING.
Amir	.. ..	Amír	.. ..	A nobleman.
Jaghir	.. ..	Jágír	.. ..	Land given by Government as a reward for services.
Kacha	.. ..	Kachá	.. ..	Clay-built.
Kachi	.. ..	Kachí	} .. ..	Low, alluvial lands.
Kadir	.. ..	Khádar		
Kardari	.. ..	Kárdári	.. ..	Agency.
Khangah	.. ..	Khángáh	.. ..	A Muhammadan shrine.
Kotwali	.. ..	Kotwáli	.. ..	Part of a district subject to the jurisdiction of a sub-ordinate Police Officer.
Maoza }	.. ..	Mauza	.. ..	Village.
Mouza }				
Nawab	.. ..	Nawáb	.. ..	Deputy, Governor.
Paka	.. ..	Pakká	.. ..	Built of stone, or brick, and mortar.
Pargana	.. ..	Pargana	.. ..	A sub-division of a district.
Rájá	.. ..	Rájá	} .. ..	A king or ruler.
Ráo	.. ..	Ráo		
Serai	.. ..	Sarée	.. ..	An inn.
Shiwala	.. ..	Shiwála	.. ..	A temple of Shíva.
Suba	.. ..	Súba	.. ..	A governor of a province.
Tahsil }	.. ..	Tahsíl	.. ..	Portion of a district subject to a revenue collector.
Tehsil }				
Talooka }	.. ..	Täalluka	.. ..	A minor sub-division of country.
Taluk }				
Táluka }				
Tappa }	.. ..	Tappá	.. ..	A small village.
Tuppa }				
Thana }	.. ..	Thána	.. ..	A sub-division of a Kotwali.
Thánah }				
Zilla	.. ..	Zilla	.. ..	A district.



ADDITIONAL ERRATA.

- 29\*—*D.* The remark in the last column bracketed against Stations CXXXI, CXXXII and CXXXIII does not apply to Station CXXXII which is still in existence.
- 99—*a.* line 2 of table from bottom, col. 7 *for* 626'62 *read* 626'02

NOTE.—The quantities shewn on page 8—*b.* under the head "Reciprocal Weight" are not those given in the Abstracts of the Observed Angles, but certain others obtained by taking cognizance of the relative performances of the instruments employed. See the Chapters of Vol. II on the reduction of the North-West Quadrilateral.



PRINCIPAL TRIANGULATION.—ERRATA.

v

PAGE.			
(9)*	line 11 of table, 5th column,	for Masári,	read Masúri.
XIII—B.	line 3 from below,	after triangulation	insert to the length of the base-line.
"	"	for distance	read length.
1—B.	in some copies, lines 24 from top, right hand col.,	" XLVIII	" LVIII.
"	line 25 from top, right hand col.,	" XLIX	" LIX.
3—B.	in some copies, in line 12 from below, right hand col.,	" Akorin	" Akoria.
8—B.	line 12 from below,	" 5.42	" 6.17
9—B.	" 4 from top,	" 3.5	" 6.7
10—B.	" 12 from below,	" Erinipoora	" Erinpoora.
"	" "	" S. E.	" N.W.
35—B.	in last angle,	" $M = 50''.2$	" $M = 50''.32$
70—B.	" 3rd " 1st zero,	" '3	" 54.32
49—b.	line 9 from top, column 2,	" LVXIII	" LXVIII.
15—c.	5th triangle from top, col. 9,	" 183 0 0.000	" 180 0 0.000
III—D.	line 4 from below,	" 1853	" 1852
"	in margin,	" 1852-53	" 1851--52
IV—D.	"	" G. Shelverton	" C. Shelverton.
XXVIII—D.	line 3 from bottom,	" East	" West.
4—D.	line 24 from top, left hand col.,	" CXIX	" XCIX.
7—D.	" 11 from top,	" 30.75	" 29.42
17—D.	" 3 "	" Maná	" Mauá.
20—D.	lines 3 and 10 from below,	" Bukkur	" Bakár.
21—D.	line 14 from top,	after Tahsil Bakar	insert district Leia.
"	" 26 "	for Kullur	read Kalúr.
22—D.	" 2 "	" Kullur	" Kalúr.
"	" 6 "	" Kalor	" Kalúr.
55—D.	in 2nd angle, 8th zero,	" $l 29'60$	" $l 29'50$
71—D.	heading,	" telescope being set on LXVI	" telescope being set on XLVI.
83—D.	"	" lesser circle readings $305^{\circ} 9'$ and $150^{\circ} 01'$ }	" $325^{\circ} 9'$ and $152^{\circ} 21'$ respec- tively.
99—D.	in last angle, 3rd mean,	" 17.1	" 17.15 [LXXV.
111—D.	heading,	" telescope being set on LXV	" telescope being set on
132—D.	passim	" Basei	" Basevi.
145—D.	in 2nd angle, 8th zero,	after $l 53'90$	insert $l 53'68$
"	in some copies, in 3rd angle,	for CXIV and CXII	read CXV and CXII.
146—D.	heading,	" telescope being set on XCVI	" telescope being set on CXVI.
40—d.	2nd triangle from top, col : 8	" - '170	" + '170
"	4th " " " 7	" - '292 and + '253	" - '291 and + '252 respec- tively.
"	" " " " 8	" + '198 and + '123	" + '199 and + '122 do.
41—d.	1st " " " 3	" (XXXIV)	" (XXIV)
48—d.	6th " " " 7	" - '307	" - '037
49—d.	2nd " " " 8	" - '220	" + '220
50—d.	2nd " from below " 11	" 55006.85	" 55006.85
59—d.	line 5 from top,	" 2 53 42.09	" 2 33 42.09

Since this volume was printed, the following information regarding the connection of certain Stations of the Great Indus Series by Spirit Leveling operations executed by Captain W. Barron, under the directions of the Superintendent of Revenue Surveys, Upper Circle, was received from the latter officer.

STATION.	HEIGHT IN FEET ABOVE MEAN SEA LEVEL DETERMINED BY SPIRIT LEVELING.			SURFACE ON WHICH THE LEVELING STAFF WAS PLACED.
XC .. ..	338	49	On the mark-stone let into the ground floor of the tower.	
XCI .. ..	414	18	On the mark-stone let into the upper surface of the platform.	
XCIH .. ..	383	84	} On the mark-stone let into the ground floor of the tower.	
XCIV .. ..	354	00		
XCV .. ..	371	27		
XCVI .. ..	375	17		
XCVIII .. ..	378	76		
XCIX .. ..	383	68		
CHH .. ..	407	71		
CVI .. ..	422	19		

J. B. N. H.

# PREFACE

TO

## VOLUMES III AND IV.



In the first chapter of Volume II of the *Account of the Operations of the Great Trigonometrical Survey of India*, it is shown that a necessity had arisen for a subdivision of the Principal Triangulation—which had been cast over the greater portion of India, and would soon be completed in the parts remaining for survey—into five great sections, each comprising a certain number of the meridional and longitudinal chains of triangles, and of slanting chains along the frontier and the coast lines—which had been executed in accordance with the gridiron system introduced by Colonel Everest in the year 1830—and also comprising the base-lines on which the linear elements of the several included chains were dependent. A Skeleton Chart of the principal chains of triangles west of the meridian of  $92^\circ$  is given opposite page 28 of Volume II, and it shows the several sections and the chains and base-lines contained within each section, as arranged in accordance with the programme which I had drawn up for the general reduction of the triangulation, for various reasons which are set forth at length in Section 7 of the chapter in question.

The section of the triangulation which is known as the North-West Quadrilateral, and is included between the meridians of  $67^\circ$  and  $78^\circ$  and the parallels of  $24^\circ$  and  $34^\circ$ , was selected as the first to be taken in hand. The chains of triangles of which it is comprised are the following :—

- A. The Great Arc, Section  $24^\circ$  to  $30^\circ$ .
- B. The Karáchi Longitudinal Series.
- C. The North-West Himalaya Series.
- D. The Great Indus Series.
- E. The Rahún Meridional Series.
- F. The Gurhágárh Meridional Series.
- G. The Jogí-Tílá Meridional Series.
- H. The Sutlej (River) Series.

The base-lines contained are those at Sironj, Dehra Dún, Chach, and Karáchi (Kurrachee), full details of which have been given in Volume I.

Two internal chains, on the meridians of  $70^\circ$  and  $72\frac{1}{2}^\circ$ , which should run northwards from the Karáchi Longitudinal to the Great Indus and the Sutlej Series, remain to complete this Quadrilateral. In 1865, when the general procedure of the reduction was determined on, they had not been commenced, and they are still (1875) far from completion. It is therefore intended that, when finished, they shall be fitted into their proper places without disturbing the results already acquired by the simultaneous reduction of the several completed chains of triangles; their details must be published separately in a supplemental volume.

The present volumes contain, *inter alia*, the following details for each of the several chains or series of triangles, A to H, already specified,—

1st. The Introduction, which gives a historical sketch and general description of the operations, and mentions the individuals by whom they were conducted.

2ndly. The Observations of the Principal Angles.

3rdly. The Reduction of each Polygonal Figure by the method of minimum squares.

4th. The final values of the Sides and Angles of the principal triangles, the Azimuths of the sides, and the Latitudes, Longitudes and Heights of the principal stations.

These volumes however do not give any of the details of the general and simultaneous reduction of the several series taken collectively, which has had to be performed in order to disperse the errors that were met with wherever any one series closed on another or on a base-line. For these details, which form the final portion of the reduction, reference must be made to the latter part of Volume II.

Before I proceed to describe the contents of the present volumes more specifically I should state that, for reasons which will be subsequently explained, the printing of a portion of them—the details of the observations of the principal angles—was commenced in 1865, when the method to be followed in the general reduction of the several series comprised in the Quadrilateral, in order to make the work harmonious and consistent throughout, had not yet been decided on, and nothing more had been determined than that this Quadrilateral was to be taken in hand first of all, before any of the other sections into which the entire triangulation of India would eventually be divided.

It was then believed that a simultaneous reduction of the eight series of triangles and the four base-lines contained in the Quadrilateral, would be impossible, because of the very large number of angles involved. A method of correction by successive approximations was therefore under contemplation, which, it was found, would be greatly simplified by treating each of the polygonal figures around the base-lines at the four corners of the Quadrilateral as constant and free from error, and consequently not throwing any portion of the errors which had been generated in the triangulation on to them in the course of the calculations for the dispersion of the errors.

With this view the four base-line figures were separated from the series to which they respectively appertained and were collected into a group by themselves, and made to form the first of the several groups into which the triangulation of the Quadrilateral was divided. Subsequently a more rigorous and exact method of reduction was devised, which could be applied simultaneously to the whole of the several chains of triangles, and then it was found that the separate grouping of the base-line figures would be not only prejudicial and inexact but unnecessary and inconvenient. The Sironj and the Dehra Dún base-line figures were therefore recombined with the section of the Great Arc which lies between them, and the Karáchi and the Chach figures with the Great Indus Series. Thus while the descriptions of the stations and the observations of the angles of these figures will be found in a group by themselves, the reductions, and the final values of the lengths and azimuths of the sides and of the latitudes and longitudes of the stations, will be found with those of the series to which they have respectively been relegated. Consequently there is an absence of uniformity in this portion of the general arrangement of the contents of these volumes, which is to be regretted as it may inconvenience persons searching through them for the data of the base-line figures. But it may be pleaded in excuse thereof that the reduction of such a vast mass of triangulation was a most formidable geodetic

problem, far exceeding—it is believed—in magnitude and intricacy anything of the kind which had ever been undertaken previously in any part of the world. Consequently allowances may well be made for a slight departure from the first conception of the programme of arrangement, the result of which has merely been that the stations of the base-line figures are not numbered in order with the stations of the series into which they were eventually incorporated, and that their descriptions and the observations taken at them must be looked for in the group in which they were originally collected and printed, whereas their co-ordinates and mutual azimuths and distances must be looked for among the results of the respective series to which they now appertain.

Thus the principal groups into which the contents of these volumes are divided are the following,—

	{	Base-line figures .. .. .	pages (1) to (32)
Volume III.	{	Karáchi Long. Series ..	pages I— <i>B</i> to XIII— <i>B</i> , I— <i>B</i> to 135— <i>B</i> and 1— <i>b</i> to 148— <i>b</i>
	{	N. W. Himalaya Series ..	„ I— <i>C</i> to XII— <i>C</i> , I— <i>C</i> to 61— <i>C</i> and 1— <i>c</i> to 42— <i>c</i>
	{	Great Indus Series .. ..	„ I— <i>D</i> to XXIX— <i>D</i> , I— <i>D</i> to 211— <i>D</i> , and 1— <i>d</i> to 136— <i>d</i>
	{	Great Arc, Sec. 24° to 30°. ..	„ I— <i>A</i> to XI— <i>A</i> , I— <i>A</i> to 78— <i>A</i> and 1— <i>a</i> to 103— <i>a</i>
	{	Rahún Meridional Series ..	„ I— <i>E</i> to VI— <i>E</i> , I— <i>E</i> to 106— <i>E</i> and 1— <i>e</i> to 80— <i>e</i>
Volume IV:	{	Gurhágárh Meridl. Series ..	„ I— <i>F</i> to X— <i>F</i> , I— <i>F</i> to 115— <i>F</i> and 1— <i>f</i> to 61— <i>f</i>
	{	Jogí-Tilá Meridional Series ..	„ I— <i>G</i> to XXVI— <i>G</i> , I— <i>G</i> to 65— <i>G</i> and 1— <i>g</i> to 35— <i>g</i>
	{	Sutlej Series .. .. .	„ I— <i>H</i> to VIII— <i>H</i> , I— <i>H</i> to 60— <i>H</i> and 1— <i>h</i> to 38— <i>h</i>

The contents of each group—with the exception of the Base-line figures—are well illustrated by the following table of the contents of the group for the Great Indus Series.

Introduction.	Narrative of the Principal Triangulation .. .. .	page	III— <i>D</i>
	<i>Narrative of the Secondary Triangulation</i>		
„	1. The Northern Trans-Indus Frontier Survey .. .. .	„	XX— <i>D</i>
„	2. The triangulation to Peshawur .. .. .	„	XXV— <i>D</i>
„	3. Triangulation to hill peaks north of the Peshawur Frontier .. .. .	„	XXVI— <i>D</i>
„	4. Triangulation to hill peaks west of the Great Indus Series .. .. .	„	XXVII— <i>D</i>
„	5. Minor triangulations in connection with the operations of the Great Indus Series .. .. .	„	XXVIII— <i>D</i>
	<i>Name-lists and Facts of Observation, &amp;c</i>		
	Alphabetically arranged list of Stations .. .. .	„	1— <i>D</i>
	Numerically arranged list of Stations .. .. .	„	3— <i>D</i>
	Description of Stations .. .. .	„	5— <i>D</i>
	Addendum to Description of Stations, containing latest details up to date .. .. .	„	25*— <i>D</i>
	The Observations of the Angles .. .. .	„	25— <i>D</i>
	Data for the computation of the Theoretical Errors of the observed angles .. .. .	„	191— <i>D</i>
	The mean Theoretical Errors of certain groups of the observed angles .. .. .	„	210— <i>D</i>
	<i>Reductions and Final Results</i>		
	Reduction of the Polygonal Figures .. .. .	„	1— <i>d</i>
	The final values of the Sides and Angles of the triangles .. .. .	„	40— <i>d</i>
	The computed Latitudes and Longitudes of the stations and the Azimuths at each station .. .. .	„	59— <i>d</i>

The trigonometrically determined Differences of Height of the stations ..	page	70— <sub>d</sub>
The Absolute Heights of the stations above the mean sea level, some determined by spirit-leveling operations others trigonometrically .. .. .	.. .. .	97— <sub>d</sub>
Descriptions of the exact points referred to in the spirit leveling operations ..	..	101— <sub>d</sub>
Astronomical observations of the Azimuth, and their reduction .. .. .	.. .. .	103— <sub>d</sub>
Addendum. Elements of points of geodetic importance connected with, but not forming a part of, the principal triangulation .. .. .	.. .. .	135— <sub>d</sub>
Plates 1 to 6. Diagrams of the several polygonal figures contained in the series.		

Here it is necessary to remark that, with the exception of the narrative of the secondary triangulations which is given with that of the principal triangulation in the Introduction to each series, these volumes contain no data whatever regarding the secondary and minor triangulations—of which a considerable amount has usually been executed in each series—but are restricted exclusively to the Principal Triangulation. Full details of the results of the secondary and minor operations are given in the Synoptical Volumes; of these one is prepared for each series, and it is made to include the descriptions of the principal stations, as here given, and the whole of the results of the principal triangulation, but it omits the details of the observations and reductions. Each Synoptical Volume also contains charts of the whole of the triangulation, both principal and secondary, of the series to which it appertains. Thus these volumes present, in a compact and convenient form, all the data which are needed for the requirements of geographers, and of topographical or fiscal surveyors who may be operating in the districts which have been passed over by the triangulation.

It has been found convenient to indicate the Principal Stations by a system of numerals as well as by their names. Consequently, at the commencement of the details of each series, two lists are given, in the first of which the stations are arranged alphabetically with the numbers opposite the names, in the second numerically with the names opposite the numbers. Roman numerals have been adopted throughout, as a distinction from the several other forms of numerals which have necessarily to be employed in a work of this nature. The numbering of the stations is progressive in order from south to north in meridional chains and from east to west in longitudinal chains, the first number for each series being unity. The numbers indicating stations of the base-line figures are enclosed within brackets, thus (I), (II) . . .,\* to distinguish them from all other stations.

The Descriptions of Stations are based generally on those made originally by the observers and entered on the spot into the angle books, subject to such modifications as are occasionally required to take cognizance of any alterations which have been subsequently effected. They give the names of the district and the subdivision in which the station was situated at the time when its description was written; but as the boundaries of these divisions are not unfrequently altered, to suit the requirements of the Local Administration, these changes are indicated in the Addendum to the Description of Stations, which also gives the latest information forthcoming regarding their condition, &c. For information regarding the general form and structure of the stations, reference should be made to Section 4 of Chapter II of Volume II.

In the pages which are allotted to the Observations of the Angles, the name of the observer and the instrument are specified at the head of the observations at each station, excepting in a few instances in which

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\* The number (XII) was inadvertently dropped originally, and has necessarily been excluded subsequently, in order to avoid the complications which would be caused by correcting all the subsequent numbers.



they could not be ascertained until after the details had been printed, in which cases they are given in the Addendum to the Description of Stations. In the details of the measures of the angles, the number of the station on which the telescope was set at the commencement of each round of measures, and the reading to which the azimuthal circle was set, after each 'change of zero,' are given; thus the graduations of the circle to which the readings were taken, at every measure of an angle, may be readily ascertained, if considered necessary for an investigation of the law of the graduation error, such as will be found for Troughton and Simms' 18-inch theodolite No. 1, in Appendix No. 4 of Vol. II. The seconds of the angles obtained, by each measure on each circle setting, are arranged in vertical columns, at the foot of which the mean is given for the setting; for an explanation of the principles by which the changes of setting have been governed and for further details of the record of the observations see Sections 2 and 4 of Chapter IV of Volume II. In the right hand column of the record—usually called the Abstract of Angles—are given  $M$ , the mean of the several groups of measures on each setting,  $w$  and  $\frac{1}{w}$ , the weight and its reciprocal of the angle as deduced from the differences between the individual measures, and  $C$ , the concluded value of the angle as derived from the observations only; for full explanations of which reference must be made to Section 4, Chapter VII, Volume II.

The record of the measures of the angles is followed by a list of the "Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros", which furnishes the requisite data for the investigation—by which it is followed—of the average 'error of mean square', of observation only, in a single measure, and that of graduation *plus* observation in the mean of the several measures on a single zero; these are determined for certain groups of the angles in which all the measures have been made by the same observer with the same instrument and under the same conditions, and also for groups formed by various other combinations of the conditions. With the data thus obtained for each of the several series, the investigation of the influence of "Mixed Errors of Observation and Graduation," which is given in Section 3 of Chapter VII of Volume II, was made.

Next come the Reductions of the several Polygonal Figures contained in the series. The object of this reduction is to render the several parts of which a figure is composed consistent and harmonious *inter se*, in such a manner that all the geometrical conditions which are involved shall be satisfied with due regard to the respective weights of the several angles. Full explanations of the principles which have been followed, and the procedure which has been adopted in these reductions will be found in Chapter VIII of Volume II. The figures are numbered consecutively throughout the triangulation of the Quadrilateral, running through the several series in the order of their alphabetical arrangement; thus fig. 9 being the last of the Great Arc, (A), fig. 10 is the first of the Karáchi Longitudinal Series, (B). Diagrams of the figures are given in the Plates appertaining to the series. The small numerals within each of the several angles (which have been actually observed) correspond to the subscripts to the symbol,  $x$ , which is employed, with the numeral for any particular angle as a subscript, to indicate the error of that angle. Thus on referring to the diagram of figure 10 and to the reduction of that figure, page 2—,  $x_7$  is the error of the angle 7, the angle subtended at Station I between Stations II and III. The tabular statements of the reductions give, *first* the observed angles and the reciprocals of their weights; *secondly* the equations by the solution of which the geometrical conditions of the figure are satisfied,—see equations (18), page 105, Volume II; *thirdly* the equations between the 'indeterminate factors',—(23), page 106; *fourthly* the values of the indeterminate factors, expressed numerically, and also in terms of the absolute errors (in the geometrical equations) expressed symbolically,—

(26), page 108; *fifthly* the values of the angular errors,—(22), page 106; and *sixthly* the summation of the product of the square of each error by its weight—(19), page 106, the value of which summation has been made a minimum, that the values obtained for the several angular errors may be the most probable of all the many values by which the geometrical conditions of the figure may be satisfied. In the group of equations between the indeterminate factors, the co-efficient of the  $p$ th factor in the  $q$ th line is the same as that of the  $q$ th factor in the  $p$ th line; and in the group of expressions of the values of the factors in terms of the absolute geometrical errors, the co-efficient of the  $p$ th error in the  $q$ th line is the same as that of the  $q$ th error in the  $p$ th line. In other words, in both these groups, if a diagonal be drawn from the co-efficient of the first term in the first line to that of the last term in the last line, the co-efficients which are symmetrically disposed on opposite sides of this line are identical with each other. Consequently only the co-efficients above the diagonal have been given; those below are omitted and their absence is indicated by asterisks.

The reduction of the figures is followed by a Tabular Statement of the Triangles. The two first columns of this table give the number which has been adopted for each triangle to designate its place in the Quadrilateral; this number depends on the circumstance whether the triangle appertains to or is exterior to the chains of single triangles which have been selected to form the several circuits whose closing errors have been eliminated by the final process of reduction, as described with full details in the latter chapters of Vol. II. The triangles which enter the circuits are shown in the Reduction Chart (facing the title page to this volume) in firm black lines, with their distinguishing numbers written in the centre; those which do not enter the circuits are shown in dotted lines, and their numbers are indicated by numerals of a smaller size than the former, which commence with 551, 550 being the number of the last of the circuit triangles of this Quadrilateral. The columns in the table which contain the corrections to the observed angles give, *first* the correction for the error of the angle, with reference merely to the polygonal figure to which it belongs, as obtained from the primary reduction of that figure; and *secondly* the further correction which has to be applied for the apportionment of circuit error, should the angle appertain to one of the circuits, or for the restoration of consistency in the polygonal figure after the application of the circuit errors, should it be a non-circuit angle. Finally the corrected plane angles and the lengths of the sides are given, as computed by the rules of Plane Trigonometry, in accordance with Legendre's theorem; see Section 1 of Chapter IX of Vol. II.

Next in order comes a Table of the Latitudes and Longitudes of the Stations and the Azimuths and Lengths of the Sides. The principles on which the calculations of the co-ordinates and azimuths have been made, and the method of computation, are fully explained in Sections 2 and 4 of Chapter IX of Volume II. All azimuths are referred to the south point and are measured round by the west.

This is followed by the Determinations of the Differences of Height of the several stations which have been deduced from the measurements of the vertical angles, as explained in Chapter XIII of Vol. II. It has not been considered necessary to give the individual measures of these angles, as has been done for the horizontal angles, as this portion of the operations is less exact and important. But the mean of the whole of the measures of each vertical angle, the mean value of the amount of refraction in each angle and of the co-efficient of refraction, the heights of the signal and of the telescope of the observer above the summits of the stations, and the differences of height of the said summits, are given.

Then comes a Table of the Absolute Heights of the stations above the mean sea level in the Harbour of Karáchi (Kurrachee). Some of these determinations have been derived from the Spirit-leveling Operations

of this Survey, of which full details are given in the *Tables of Heights in Sind, the Punjab &c., Calcutta*, 1863, and the remainder by referring the trigonometrical differences of height to the nearest stations whose absolute heights were determined by the spirit-leveling operations. The errors generated trigonometrically, between any two spirit-leveled stations, have been dispersed by simple proportion over the intermediate trigonometrical values.

It may be here stated that all trigonometrically determined heights invariably refer to the upper surfaces of the central masonry pillars at the principal stations. Spirit-leveled values sometimes refer to the upper surface and sometimes to the basement of the pillar, whichever the leveling-staff was set upon; a description of the exact point referred to is given in each instance, at the end of the "Height above Mean Sea Level."

Finally come the details and reductions of the Astronomical Observations which have been taken, at certain stations in each series, for the determination of the azimuth, either of one of the surrounding stations, or of a referring mark, the angle between which and a contiguous station has been measured. The observations and the method of reducing them are fully described in Chapter XII of Volume II. For reasons which are explained in the first section of that chapter, the results have not been used in the general reduction of the Quadrilateral, further than to give a more exact mean value of the fundamental azimuth (that at Kaliánpúr) than the one obtained by the observations on the spot. At the end of the details of the determination of each azimuth, the difference between the observed value and the value obtained by calculation through the triangulation from the fundamental azimuth is given. These differences should be of much value in future investigations of the figure of the earth and of the influence of local attraction.

Full details regarding the unit of the linear measures, the base-lines, the initial elements of latitude longitude and azimuth, and the elements of the figure of the earth which have been adopted in the calculations, will be met with in Volumes I and II. In this place it is only necessary to state that,—

(1). The unit of length is the Indian Standard 10-feet Bar **A**, the relations between which and the principal European Standards of Length are given at page 28 of Volume I.

(2). The base-lines on which the Quadrilateral is dependent are those at Sironj, Dehra Dún, Chach and Karáchi; and the values of their lengths which have been employed in the reductions are identical with those given at pages III—25, II—44, VI—28 and VII—27 of Volume I respectively.

(3). The fundamental elements of latitude, longitude and azimuth at the initial station, Kaliánpúr, are

Latitude, North	24° 7' 11"26
Longitude, East of Greenwich	77 41 44"75
Azimuth of Súrántál	190 27 5"10

(4). The adopted elements of the figure of the earth—assumed to be spheroidal—are as follow,  $a$  being the semi-major axis,  $b$  the semi-minor axis,  $c$  the compression =  $\frac{a-b}{a}$ , and  $e$  the excentricity =  $\sqrt{\frac{a^2-b^2}{a^2}}$

$a = 20,922932$ feet	log.	7.320,6225,4
$b = 20,853375$ „	„	7.319,1763,4
$c = 0.003,324 = \frac{1}{300.80}$	„	3.521,7196,8
$e^2 = 0.006,638$	„	3.822,0271,8

The longitudes depend on an astronomically determined value of the longitude of the Madras Observatory, which was deduced, about the year 1815, as  $80^{\circ} 17' 21''$ . There is reason to believe that this value is about 3' too great; but, pending the final determination of the longitude of the Madras Observatory by electro-telegraphic communications with the Royal Observatory at Greenwich, it has not been considered desirable to alter the value which was adopted in 1815 and has been maintained up to the present time. Meanwhile the following precept will probably be found sufficiently exact for preliminary requirements,—

**All the values of Longitude in these volumes require a constant correction,  
probably of -3'.**

As regards the Orthography of Indian names, I am sorry to have to state that it has not been possible to adopt a uniform system throughout the present volumes. Many years ago Colonel Everest endeavoured to bring into general use in the Survey Department Sir William Jones' method, which is at once elegant and phonical, and is highly approved of by scientific men. But that method gives to all vowels their Italian sounds; and as the differences between the English and the Italian sounds are, in almost every instance, very considerable, and it is easier to lay down rules than to find followers for them, the surveyors gradually got into the way of using *ee* for the Italian *i* and *oo* for the Italian *u*, and of spelling generally in the manner that is natural to most Englishmen. In 1865, when the preparation of the final results was commenced, the spellings were corrected in accordance with Sir William Jones' system, excepting in the case of well-known names—such as Meerut, Calcutta, Cawnpore—which had become settled and familiar by long use and which it would have been pedantic to alter. But in 1871 the Government of India made arrangements for the introduction of a uniform system of spelling throughout India, and circulated a "*Guide to the Orthography of Indian Proper Names, with a list showing the true spelling of Post-towns in India,*" which was prepared by Dr. W. W. Hunter, *L.L.D.*, Director General of Statistics to the Government of India; the guide was sent to this Department with instructions that the directions it contained should be immediately complied with. Dr. Hunter's rules for spelling unfamiliar names, not given in his list of post-towns, are very similar to the rules which had been adopted in this Department, the chief difference being that the long *a*, *i* and *u* are required to be frequently un-accented, whereas by our rules they are invariably accented. In his list of post-towns however Dr. Hunter has not followed a uniform system of spelling, but has effected a compromise which—in his own words—"by sacrificing something in scientific precision, obtains a spelling more accurate than at present and yet recognizable as the same name." Thus the hill station at which the Head Quarters of this Survey are located, during the summer months, is spelt ordinarily Mussoorie and scientifically Masúri but according to Dr. Hunter it should be spelt Masauri. In September 1873 the Government of India issued amended rules for the spelling of all names not well known, which are practically identical with those originally followed in this Department. At the same time it was ordered that the orthography of the well-known names should be retained, and that a list of all note-worthy names should be prepared, in each Province, showing the orthography to be uniformly followed in future official correspondence and publications. When these lists are published, uniformity of spelling will become possible; to what extent uniformity of system will be secured will depend on the latitude taken by the compilers of the lists in defining the number of names which are to be considered as well-known; and this is a point on which considerable differences of opinion are known to exist; some of the lists already published are eminently conservative of the old fashioned anglicized spellings, while in others the names which remain unchanged bear but a very small proportion to those which have been altered.

Certain portions of the present volumes having been printed before, and others after, the issue of the several orders above quoted, the attempts to introduce a uniform system of orthography have occasionally led to considerable diversities of spelling, and in not a few instances to the adoption of one spelling, then of another and finally the return to the first; as in Dúu, Doon, and finally, Dúu,—or Cutch, Katch, Kach'h, and finally Cutch; or to successive divergencies from the first spelling, as Masúrí, Masauri, Mussoorie, and finally Mussooree. It is however hoped that, notwithstanding such departures from a standard spelling, of which there are several instances, all the names will be recognizable. As a general rule the pronunciations of the vowels are as follow; *a* has a variable sound as in woman, rural, paltry; *á* as in tartan; *i* as in bit; *f* as in ravine; *u* as in bull; *ú* as in rural; *o* as in note; *e* as in say; *au* as *ou* in cloud; *ai* as *i* in ride.

As regards the typography and general getting up of these volumes, it is necessary to state that the printing has extended over several years; that of the Names and Descriptions of Stations and of the Details of the Observations was commenced in the year 1865, while the remaining portions have been carried on *pari passu* with the general reduction of the triangulation. It has therefore been found impossible to number the pages of the volumes in consecutive order from first to last; for this would have involved either the locking up for an indefinite period of a far larger amount of type than is contained in the Head Quarter's Office, or the postponement of the printing until the completion of the whole of the reductions, which would have been exceedingly inconvenient. Thus the numbering of the pages commences afresh from 1, twice in each series, the first time for the Description of Stations and—speaking generally—the details of the Facts of Observation, and the second time for the details of the Reductions of the Observations and the Final Results. The serial letter adopted for each series—as shown in the Reduction Chart—is appended as a subscript to the numbers of the several pages appertaining to that series, thus,

GREAT INDUS SERIES—*D*.

Introduction .. .. .	pages 1— <i>D</i> .	to	xxix— <i>D</i> .
Names and Descriptions of Stations, Observations of Angles, &c. ..	„ 1— <i>D</i> .	to	211— <i>D</i> .
Reductions of Figures. Triangles. Co-ordinates of Stations, &c. ..	„ 1— <i>d</i> .	to	136— <i>d</i> .

In order to equalize the contents of both the volumes, it was found necessary to transfer the portion appertaining to the Great Arc, all which had been printed with the subscript *A*, to the fourth volume, instead of placing it first in order in the third volume. In all other cases the several series follow in the order of the letters of the alphabet by which they are distinguished.

The general arrangement of these volumes, and the preparation of the data which they contain, are due in great measure to Mr. J. B. N. Hennessey, F.R.S., Deputy Superintendent 1st Grade in charge of the Computing Office, and also to Mr. W. H. Cole, M.A., Assistant Superintendent 1st Grade; both of these officers have taken very great pains to secure the utmost possible accuracy in preparing the data and passing them through the press.

J. T. WALKER, COLONEL R.E.,

November 1875.

Supdt. Great Trigonometrical Survey of India.



**BASE-LINE FIGURES.**





BASE-LINE FIGURES.  
ALPHABETICAL LIST OF STATIONS.

<p>Amsot . . . . . (XI).</p> <p>Banog . . . . . (X).</p> <p>Bhaorása . . . . . (V).</p> <p>Bol . . . . . (XXIII).</p> <p>Bolálio . . . . . (XXV).</p> <p>Chach base-line, Agzar or North- East End } (XIV).</p> <p style="padding-left: 40px;">Ditto, Kálu or South- West End } (XIII).</p> <p>Dehra Doon base-line, East End (IX).</p> <p style="padding-left: 40px;">Ditto, West End (VIII).</p> <p>Gandgarh . . . . . (XVI).</p> <p>Kaliánpúr . . . . . (VII).</p> <p>Kámkherá . . . . . (IV).</p>	<p>Karáchí base-line, North End . (XXI).</p> <p style="padding-left: 40px;">Ditto, South End . (XX).</p> <p>Khagríáná . . . . . (XVIII).</p> <p>Loiset . . . . . (XV).</p> <p>Magar Pir . . . . . (XXII).</p> <p>Maio . . . . . (XXIV).</p> <p>Párdho . . . . . (VI).</p> <p>Pathrijálá . . . . . (XVII).</p> <p>Sironj base-line, North-East End (II).</p> <p style="padding-left: 40px;">Ditto, South-West End (I).</p> <p>Súrantál . . . . . (III).</p> <p>Surlá . . . . . (XIX).</p>
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BASE-LINE FIGURES.  
NUMERICAL LIST OF STATIONS.

(I)	Sironj base-line, South-West End.	(XIV)	Chach base-line, Agzar or North-East End.
(II)	. Ditto, North-East End.	(XV)	. . . . . Loiset.
(III)	. . . . . Súrantál.	(XVI)	. . . . . Gandgarh.
(IV)	. . . . . Kámkherá.	(XVII)	. . . . . Pathrijálá.
(V)	. . . . . Bhaorása.	(XVIII)	. . . . . Khagriáná.
(VI)	. . . . . Párdho.	(XIX)	. . . . . Surlá.
(VII)	. . . . . Kalánpúr.	(XX)	. Karáchí base-line, South End.
(VIII)	Dehra Doon base-line, West End.	(XXI)	. Ditto, North End.
(IX)	. Ditto, East End.	(XXII)	. . . . . Magar Pir.
(X)	. . . . . Banog.	(XXIII)	. . . . . Bol.
(XI)	. . . . . Amsot.	(XXIV)	. . . . . Maio.
(XIII)	{ Chach base-line, Kálu or South-West End.	(XXV)	. . . . . Bolálio.

## BASE-LINE FIGURES.

### DESCRIPTION OF STATIONS.



(I). Sironj base-line, South-West End Station, lat.  $24^{\circ} 5'$ , long.  $77^{\circ} 48'$ , is situated on the lands of the village of Parsora, in pargana Sironj of the territories of the Nawab of Tonk. The circumjacent villages, with their distances and bearings, are as follows:—Parsora, 1.1 miles E.; Rasali, 3.5 miles N.N.W.; Eklaod and Kachpura, 3.0 miles N.E.; Bania Dhana and Ekodia, 1.3 miles S.E.

The station is marked by a prismatic stone, having a circle and dot engraved on the upper surface, sunk endwise to a level with the surface of the ground. Over this stands a pillar of masonry 2 feet high, and 4 feet in diameter, having a mark-stone in its upper surface with the usual circle and dot engraved on it adjusted normally over the lower mark. The whole is enclosed by a square pile of earth. The lowest dot is the one that was used in the measurement of this base-line.

(II). Sironj base-line, North-East End Station, lat.  $24^{\circ} 9'$ , long.  $77^{\circ} 53'$ , stands on the lands of the village of Rájpur, in pargana Sironj of the territories of the Nawab of Tonk. The circumjacent villages, with their distances and bearings, are,—Rájpur, 0.7 miles E.; Tal Barodia, 1.5 miles N.E.; Thanarpur Binchakeri, 1.2 miles E.S.E.; and Sialpur, 1.7 miles S.

The station is marked precisely after the method adopted for the South-West End Station.

(III). Súrantal Hill Station, lat.  $24^{\circ} 14'$ , long.  $77^{\circ} 43'$ , is situated in pargana Sironj of the territories of the Nawab of Tonk, and stands on the highest swell of an extensive range of flat hills running north and south. The circumjacent villages, with their distances and bearings, are,—Súrantal, about 2 miles N.N.E.; Bemakheri, about  $1\frac{1}{2}$  miles S.W.; and Sareko, about 2 miles S.S.W.

The pillar is solid, and has the usual mark-stone at top.

(IV). Kámkherá Hill Station, lat.  $24^{\circ} 0'$ , long.  $77^{\circ} 46'$ , stands on the lands of the village of Imlani, in pargana Sironj of the territories of the Nawab of Tonk. The circumjacent villages, with their distances and bearings, are,—Imlani, 2 miles N.W.; Kámkherá,  $1\frac{1}{2}$  miles W.; Ladhora, about 2 miles N.; and Kua, about 2 miles S.

The pillar is solid, and 10 feet high. It has a mark-stone at top, another at bottom, and two others at distances of 2 and 6 feet respectively above the latter.

(4)

BASE-LINE FIGURES.

(V). Bhaorása Hill Station, lat.  $24^{\circ} 8'$ , long.  $78^{\circ} 3'$ , is built on a low ridge of sandstone, situated in pargana Bhaorása of the Gwalior territories. The circumjacent villages, with their distances and bearings, are,—Bherkheri, about 2 miles N.W.; Kiria, about 2 miles N.E.; Salitra, about 2 miles S.S.W.; and Sarkandi, about 2 miles W.

The pillar is solid, and about 11 feet high. It has a mark-stone at top, another at bottom, and a third between them.

(VI). Párdho Hill Station, lat.  $24^{\circ} 16'$ , long.  $77^{\circ} 49'$ , is built on a range of flat hills, distant about 2 miles N. of the village of Párdho, in pargana Sironj of the territories of the Nawab of Tonk. The village of Sungai is distant to the S. about 2 miles.

The pillar is solid. It has a mark-stone at top, and another at bottom.

(VII). Kalíánpúr Hill Station, lat.  $24^{\circ} 7'$ , long.  $77^{\circ} 42'$ , is situated on a flat elevated ridge of iron-clay formation, locally called Bhuri Tori, which skirts the Sironj valley to the S.W. and N., and is in the territories of the Nawab of Tonk. The circumjacent villages, with their distances and bearings, are,—Kalíánpúr, about 1 mile S.; Jelálpúr, about 1 mile S.W.; Bandera, about  $1\frac{1}{2}$  miles N.W.; and the city of Sironj, about 2 miles S.E.

The station is marked by a solid isolated pillar, 2 feet high, containing mark-stones at top and bottom and enclosed in a platform of solid masonry  $14\frac{1}{2}$  feet square.

There are two meridional pillars connected with this station, one to the N. at a distance of 5773.9 feet and the other to the S. at a distance of 6056.8 feet, on both of which the direction of the meridian is accurately laid down.

*Kalíánpúr Observatory.*—Besides the platform which defines the principal station of Kalíánpúr and its two meridional pillars, another site is fixed due West at the distance of 40.591 feet for the astronomical observations. A pillar 4 feet 5 inches in diameter and 4 feet 4 inches deep was built of solid masonry below the ground as a foundation, having a stone pillar 4 feet 1 inch in length, into which a piece of brass marked with a dot has been let to define the station; above this station a pillar was built 3 feet high and 4 feet in diameter for the astronomical circle to stand on; this pillar is isolated with respect to the floor by means of a groove round it of 12 inches deep and 5 inches broad, and a hollow cylindrical space of 4 inches diameter runs vertically through the pillar in order to allow the instrument to be centered over the dot on the ground below. There are two meridional pillars connected with this station at the same distance as those built for the principal station of observation, on which also the direction of the meridian has been accurately laid down.—*Everest's Measurement of the Meridional Arc of India*, p. 251.

(VIII). Dehra Doon base-line, West End Station, lat.  $30^{\circ} 20'$ , long.  $77^{\circ} 54'$ , is situated in the district of Dehra Doon, about 2 miles to the E. of the small village of Sherpúr, and about 1 mile S. from the Asan river.

The following description of the station is taken from the original record by Colonel Everest:—

“A stone 5 feet in length and 1 foot square base was sunk to the surface of the ground and lodged in a pile of masonry 14 feet square with a circular pillar of masonry in the middle of 4 feet diameter, the pillar being built disjointed from the rest of the pile in order that the instrument might remain isolated. Into the exposed surface of the central stone a piece of brass was soldered on which was inserted a fine silver wire to receive the small dot which marked the limit of the base-line. This was covered over by a circular brass plate 2 inches diameter fixed by 3 screws, the female screws of which were cut in pieces of brass soldered into the stone. The upper surface of the brass plate was left even with that of the stone, a circular space being hollowed out to admit it. A parapet wall of 12 inches high was erected round the platform and ultimately when the base was concluded the whole was built up to a level with this parapet, a supplemental stone of 1 foot square and 3 inches thick with a piece of brass and dot soldered into it being accurately placed over the dot in the lower stone by means of the centering telescope of the large theodolite. For protection against cattle and other intruders a thick hedge of prickly pear was planted round the platform.”

The station was constructed in 1834-35, but when visited in 1867, was found with great difficulty; the prickly pear hedge had disappeared, and there was nothing to distinguish the station from the numerous mounds which were scattered around. For its future better protection and to facilitate identification, a tower was built over the masonry platform above described, with sides parallel or perpendicular to the line of the base, and an arched passage 5 feet wide and 6 feet high, to allow of access to the mark-stones, should the base be remeasured at any future time. The tower is about 10 feet square and 8 feet high; it has an external masonry staircase leading to the summit, which is horizontal, to serve as a platform for future observations. A central pillar 4 feet in diameter rests on the vault, and rises to the level of the platform, but is separated therefrom by an annulus; it is perforated for reference to the marks below, the perforation being closed above by a mark-stone containing the usual circle, and a fine hole bored through the stone instead of the usual central dot; the mark on this stone is truly in the normal of those below, and is 10.23 feet above Colonel Everest's upper mark.

As the mark on the top of the new tower will suffice for ordinary use, the entrances to the vault have been bricked up with masonry, for the better protection of the original marks.

(IX). Dehra Doon base-line, East End Station, lat.  $30^{\circ} 17'$ , long.  $78^{\circ} 1'$ , is situated on the extremity of one of the spurs of the Gháti or Siwalik range of hills, in the district of Dehra Doon. The nearest village is Mohabawála, about a mile to the South-East. The Asan river winds round the foot of the spur, and one branch of it takes its rise in a ravine about 100 yards to the westward of the station.

This station is described by Colonel Everest as having been "marked in the same manner as the western limit, so that a description of one will answer for the other."

It was visited by Captain Branfill in January 1862, to be connected with the line of spirit levels which had been brought up from Karáchi harbour, as a part of the operations of this department. As no record was forthcoming of the height of Colonel Everest's upper mark above the mark on the stone pyramid, to which the base-line measurement was referred, it was necessary to remove the upper mark-stone; then the level of the summit of the pyramid was determined as 1957.65 feet above the mean sea level of Karáchi harbour; Colonel Everest's upper mark was found to have been 17 inches, or 1.42 feet above the mark on the pyramid; the stone slab containing the said upper mark was replaced in the normal of and at its original height above the mark on the pyramid.

In 1867 a tower was built over the station similar to the one that was constructed in the same year over the west end of the base, the description of which may be referred to for further details. The mark in the stone on the summit of the tower is 8.71 feet above Colonel Everest's upper mark, and consequently 1967.78 feet above the mean sea level of Karáchi harbour, as determined by the spirit levelling operations.

(X). Banog Hill Station, lat.  $30^{\circ} 29'$ , long.  $78^{\circ} 3'$ , is situated on a detached peak of the lower range of the Himalaya mountains, being thrown back about a mile to the north of the range whereon stands the sanitarium of Mussoorie. The station is in the district of Dehra Doon.

The pillar is solid, and 2 feet high. It has a mark-stone at top, and another at bottom.

(XI). Amsot Hill Station, lat.  $30^{\circ} 23'$ , long.  $77^{\circ} 44'$ , stands on the highest point of the Gháti or Siwalik range of hills, which bounds the Doon to the south. The station is in the district of Dehra Doon. The nearest village is Timli, distant about 3 miles to the N.E.

A stone, 4 feet long, bearing a piece of brass with a dot on it, marks the station. It is surrounded by a platform of brick and mortar.

(XIII). Chach base-line, Kálu or South-West End Station, lat.  $33^{\circ} 53'$ , long.  $72^{\circ} 25'$ , is situated on the south end of a mound to the S. of the village of that name, in the Chach valley; thana Hazro, pargana Attok, tappa Haveli, tahsil Hassan Abdal, and district Rawul Pindi.

The pillar is solid, and 4.5 feet high. It contains three mark-stones, one at top, another at bottom, and the third 2 feet below the former. Of these marks, the one uppermost was used in the measurement of this base-line. The dot in question is on a piece of silver let into a slip of brass, which latter is fixed in the stone. The pillar and mark-stones are protected by a hemispherical dome of masonry, on the key stone of which a mark for ordinary reference will be found.

(6)

BASE-LINE FIGURES.

(XIV). Chach base-line, Agzar or North-East End Station, lat.  $33^{\circ} 57'$ , long.  $72^{\circ} 32'$ , is situated on the southern end of a mound in the Chach valley; mouza Agzar, thana Hazro, tappa Sirkani, pargana Attok, tahsil Hassan Abdal, and district Rawul Pindi.

The pillar is solid, and 5.2 feet high. It contains three mark-stones, one at top, another at bottom, and a third 2.8 feet below the former. Of these marks the uppermost one was used in the measurement of this base-line. The dot in question, and the means employed for its protection, are similar to those adopted for the West End of this base.

(XV). Loiset Hill Station, lat.  $33^{\circ} 47'$ , long.  $72^{\circ} 38'$ , is situated on the range of hills immediately S. of the large and well-known town of Bhurhan; mouza Bhurhan, pargana Attok, tappa Haveli, tahsil and thana Hassan Abdal, and district Rawul Pindi.

The pillar is solid, and 3 feet high. It has a mark-stone at top, and another at bottom.

(XVI). Gandgarh Hill Station, lat.  $33^{\circ} 57'$ , long.  $72^{\circ} 46'$ , is situated on the summit of the well-known hill of that name, in pargana Gandgarh, thana Dar Chitti, and district Hazara.

The pillar is solid, and 2 feet high. It has a mark-stone at top, and another at bottom.

(XVII). Pathrijálá Hill Station, lat.  $33^{\circ} 39'$ , long.  $72^{\circ} 21'$ , is on the range of low hills connecting Bilandri Chitti and Barra Chitti or Nilab, in mouza Kalidili, pargana Attok, tahsil Pindi Gheb, thana Nari, tappa Tutho, and district Rawul Pindi.

The pillar is solid, and 4 feet high. It has a mark-stone at top, and another at bottom.

(XVIII). Khagríáná Hill Station, lat.  $33^{\circ} 44'$ , long.  $73^{\circ} 0'$ , is on the hill of that name, the watershed of which is the boundary between the districts of Hazara and Rawul Pindi. The station is in the latter district. The small village of Kaitla is about a mile S.W. of the station, and on the same hill. The road leading up to the station commences at the large and well-known village of Shadutta, in thana, tahsil and district of Rawul Pindi.

The pillar is solid, and 2 feet high. It has a mark-stone at top, and another at bottom.

(XIX). Surlá Hill Station, lat.  $33^{\circ} 23'$ , long.  $72^{\circ} 39'$ , is situated on a range of low hills, in mouza Kundwal, pargana and tahsil Pindi Gheb, thana Jund, and district Rawul Pindi. The large villages nearest to the station are, Dhoornal to the S., and Malal to the N.

The pillar is solid, and 2 feet high. It has a mark-stone at top, and another at bottom.

(XX). Karáchí base-line, South End Station, lat.  $24^{\circ} 53'$ , long.  $67^{\circ} 12'$ , is situated in the district of Karáchí, and within a few yards of the road from Karáchí to Tattah. It is about 2 miles from the halting ground called Jemadar-ka-Landi, and some 9 miles E.S.E. from Karáchí.

The station is marked by a tower 22.9 feet high. An arched passage at the level of the ground, and parallel to the base-line, runs through the tower. On this arch and in the centre of the tower is an isolated and perforated pillar rising to the level of the top of the tower. The continuation of this pillar into the basement of the tower, contains the mark-stones. These are three in number, the first being at the level of the passage-floor, the second and third 1.8 feet and 3 feet respectively lower down, and all in the same normal. The uppermost mark consists of a dot on silver let into a brass plug, the latter being imbedded in a slab of stone. This dot was used in the measurement of the base-line. It is protected by a small dome of some 6 inches internal radius, and the entrances to the passage are closed with masonry. The upper orifice of the perforation through the tower is covered with a stone which bears a mark for ordinary reference. The entire structure is built of solid stone and lime masonry.

DESCRIPTION OF STATIONS.

(7)

(XXI). Karáchi base-line, North End, lat.  $24^{\circ} 59'$ , long.  $67^{\circ} 15'$ , is situated in the Karáchi district, and stands on an open plain entirely devoid of habitations.

The station is marked and protected similarly to the South End of this base-line, the only difference being that the tower here is 18.4 feet high.

(XXII). Magar Pir Hill Station, lat.  $24^{\circ} 59'$ , long.  $67^{\circ} 4'$ , is situated on a peak of the low range of hills which forms the eastern boundary of the valley through which the river Hubb flows, the higher range of the Pubb mountains forming that to the west. It is in the Karáchi district. The station adjoins a conical stone tomb on the S.E. side. The small double-domed masonry Kooba of Magar Pir, in the vicinity of which there are three hot springs, lies in the valley, at a distance of 0.9 miles to the S.E.

The pillar is solid, and 3 feet high. It has a mark-stone at top, another at bottom, and a third 2 feet above the latter.

(XXIII). Bol Hill Station, lat.  $24^{\circ} 55'$ , long.  $67^{\circ} 23'$ , stands on the highest of three knobs on a hill 3 miles N.W. of Gagar, on the hill road between Karáchi and Kotree. It is in the Karáchi Collectorate of Scinde.

The pillar is solid, and 3 feet high. It has a mark-stone at top, another at bottom, and a third 2 feet above the latter.

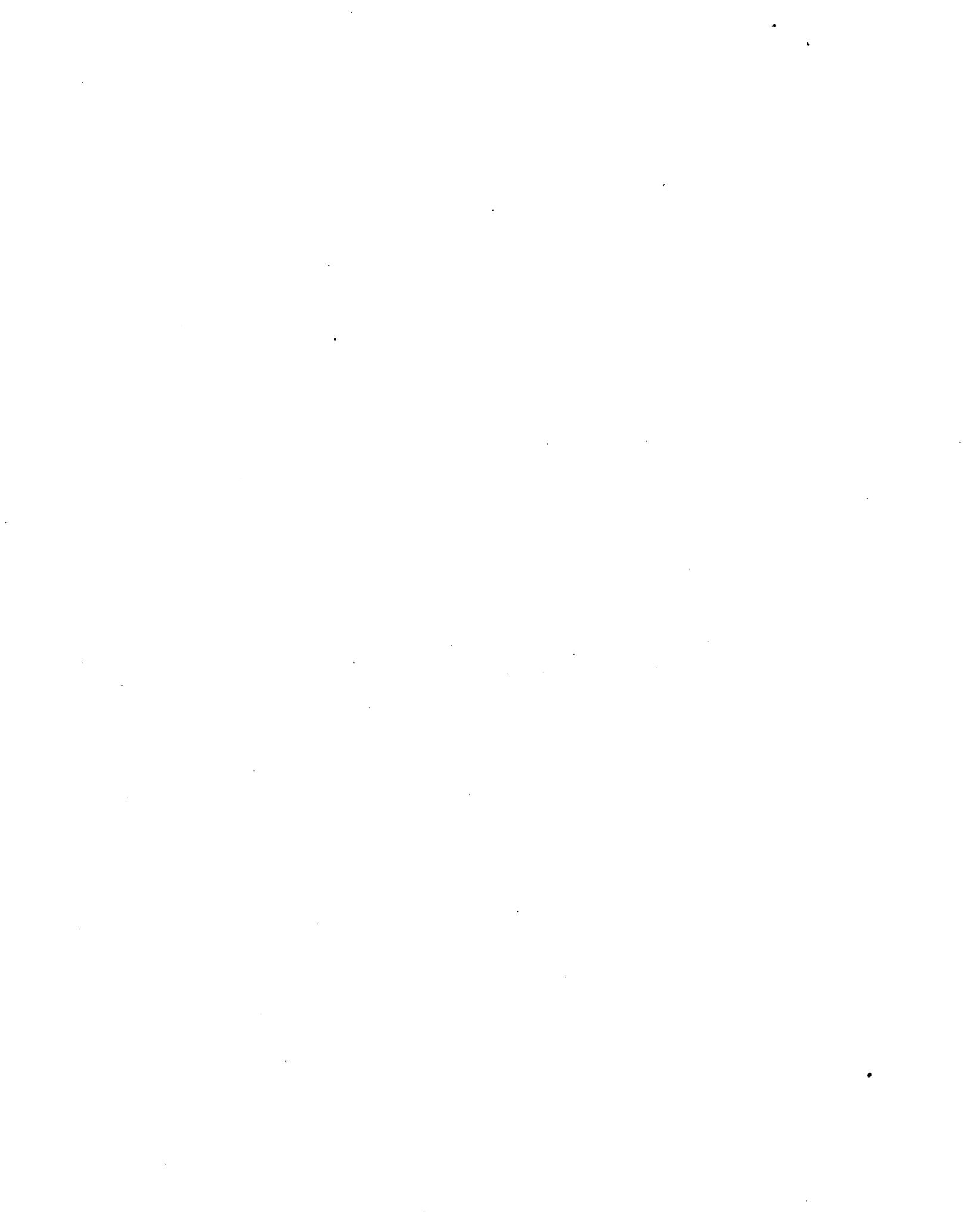
(XXIV). Maio Hill Station, lat.  $25^{\circ} 11'$ , long.  $67^{\circ} 8'$ , is on the same range of hills as Magar Pir station, and commands, to the east, an extensive view of the plain in which the Karáchi base-line is situated. The station is in the Karáchi district.

The pillar is solid, and 3 feet high. It has a mark-stone at top, another at bottom, and a third 2 feet above the latter.

(XXV). Bolálio Hill Station, lat.  $25^{\circ} 9'$ , long.  $67^{\circ} 24'$ , stands on the highest point of a very extensive irregular shaped hill, in the Karáchi district. The hill commands a view to the south of the plain in which the Karáchi base-line is situated. The river Tudda flows round the western foot of the hill, at a distance of about 3 miles, and the village of Morid-ka-got lies about 8 miles W.

The pillar is solid, and 3 feet high. It has a mark-stone at top, another at bottom, and a third 2 feet above the latter.

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ADDENDUM TO DESCRIPTION OF STATIONS.

(9)\*

NOTE.—Consequent on modern alterations of district and other boundaries, the sites occupied by the stations are now included in civil divisions of territory which differ frequently from the district, pargana or village, recorded in the preceding descriptions of stations: a suitably modified statement of the subdivisions in question is accordingly given in the following table and is derived chiefly from the annual reports, up to 1873, made by the Civil Officials to whose care the stations have been committed.

As it has not been stated in the usual place by whom the observations at the Sironj and Dehra Dun base-line stations were taken it is desirable to mention here that the observer was Major Everest and the Instrument used Barrow's 36-inch theodolite.

It has become customary in modern times to erect a square protecting pillar at Principal Stations over the circular pillar on which the large theodolite stood and which carries the true mark-stone; the square pillar bears a sufficiently accurate mark for Topographical and Revenue Survey purposes, so that it is generally unnecessary to refer to the true mark-stone which thus remains concealed and protected. The stations which are protected in the manner described are indicated by †

No.	Local name	District	Pargana &c.	Village	Remarks
(I) †		Sironj	Sironj	Parsora	Visited by Lieutenant C. Strahan R.E. of the Topographical Survey in 1870, and reported by him to be in good order. Protected by a tower 10 feet square and 8 feet high with a mark-stone at the top. Platform considerably damaged on the west and south sides. Protected by a dome of masonry on the keystone of which a mark has been placed in the normal of those below. Protected by a brass-plate surmounted by a small masonry dome.
(II) †		"	"	Rájpur	
(III) †	Súrantál	"	"	Gopálpur	
(IV) †	Khámkhera	"	"	Imláni	
(V) †		Gwalior	Malárgarh	Bhaorássa	
(VI) †	Párdho	Sironj	Sironj	Párdho	
(VII) †	Kaliánpur	"	"	Kaliánpur	
(VIII)	Sahanspur Forest	Dehra Dun	Dehra Western Dun	Sahanspur Forest	
(IX)	Chandrabani Forest	"	" "	Chandrabani Forest	
(X) †	Tibba Binauri	"	" "	Masári	
(XI)	Timli Forest	"	" "	Timli Forest	
(XIII)	Burj	Ráwal Pindi	Atak (Attock)	Kálu Khurd	
(XIV)	"	"	"	Asunsur	
(XV)	Kurri Mar	"	"	Burhán	
(XVI)		Hazára	Gandgarh		
(XVII)	Burj Kampás	Ráwal Pindi	Pindi Ghaib	Káli Dilli	
(XVIII)	Kála Pind	"	Gújar Khán	Bijníal	
(XIX)	Burj Pír Kundia	"	Kahúta	Dhoke Mári	
(XX)	Dighwáro Thul	Karáchi	Táluka Karáchi	Mullir Makán Digh	
(XXI)	Thuing Wáro Thul	"	" "	Hubb Makán Thuing and Dugan	
(XXII)	Magar Pír	"	" "	Hubb Makán Magar Pír	
(XXIII)	Bor	"	" "	Mallir Makán	
(XXIV)	Sagio	"	" "	Darsáno Chúto	
(XXV)	Bolári	"	" "	Hubb Makán Maio and Gudap Hubb Makán Thudo	

NOTE.—Stations (I) to (VII) visited by Bábu Narsing Dás, Native Surveyor of the G. T. Survey, during the season of 1867-68, put in thorough repair, protected and transferred by him to the charge of local officials.



## BASE-LINE FIGURES—SIRONJ.

## OBSERVED ANGLES.



<i>At (I)</i>									
<i>January 1837, and January 1838, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (IV)								$M$ = Mean of Groups $w$ = Relative Weight $C$ = Concluded Angle
	227° 19'	47° 19'	236° 19'	56° 19'	245° 19'	65° 19'	254° 19'	74° 19'	
(IV) & (III)	"	"	"	"	"	"	"	"	$M = 28''\cdot 03$ $w = 3\cdot 76$ $\frac{1}{w} = 0\cdot 27$ $C = 132^{\circ}42'28''\cdot 03$
	<i>h</i> 29'40	<i>h</i> 29'06	<i>h</i> 26'98	<i>h</i> 27'32	<i>l</i> 29'24	<i>h</i> 25'48	<i>l</i> 26'90	<i>l</i> 28'94	
	<i>h</i> 28'10	<i>h</i> 29'42	<i>h</i> 27'34	<i>h</i> 26'90	<i>l</i> 30'02	<i>h</i> 25'84	<i>l</i> 26'96	<i>l</i> 30'58	
	<i>h</i> 28'80	<i>h</i> 27'86	<i>h</i> 26'62	<i>h</i> 25'60	<i>l</i> 28'70	<i>h</i> 27'18	<i>l</i> 28'74	<i>l</i> 30'74	
	28'77	28'78	26'98	26'61	29'32	26'17	27'53	30'09	
(III) & (II)	<i>h</i> 13'84	<i>h</i> 15'08	<i>h</i> 13'80	<i>h</i> 14'90	<i>h</i> 14'36	<i>h</i> 16'88	<i>h</i> 13'90	<i>h</i> 15'00	$M = 15''\cdot 05$ $w = 11\cdot 12$ $\frac{1}{w} = 0\cdot 09$ $C = 73^{\circ}39'15''\cdot 05$
	<i>h</i> 13'44	<i>h</i> 15'22	<i>h</i> 15'08	<i>h</i> 15'46	<i>h</i> 15'58	<i>h</i> 15'82	<i>h</i> 15'68	<i>h</i> 14'72	
	<i>h</i> 14'04	<i>h</i> 15'84	<i>h</i> 14'38	<i>h</i> 15'60	<i>h</i> 14'54	<i>h</i> 16'86	<i>h</i> 15'30	<i>h</i> 15'80	
	13'77	15'38	14'42	15'32	14'83	16'52	14'96	15'17	

<i>At (II)</i>									
<i>January 1837, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (V)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	9° 50'	189° 50'	18° 50'	198° 50'	27° 50'	207° 50'	36° 50'	216° 50'	
(V) & (IV)	"	"	"	"	"	"	"	"	<i>M</i> = 33''·83 <i>w</i> = 4·08 $\frac{1}{w}$ = 0·25 <i>C</i> = 122° 7' 33''·83
	<i>h</i> 35'72	<i>h</i> 34'52	<i>h</i> 36'50	<i>h</i> 35'32	<i>h</i> 32'86	<i>h</i> 32'88	<i>h</i> 33'00	<i>h</i> 33'42	
	<i>h</i> 35'08	<i>h</i> 34'30	<i>h</i> 34'85	<i>h</i> 35'22	<i>h</i> 32'24	<i>d</i> 32'71	<i>d</i> 32'24	<i>h</i> 33'56	
	<i>d</i> 34'29	<i>h</i> 34'68	<i>d</i> 35'32	<i>h</i> 34'98	<i>h</i> 32'00	<i>d</i> 31'83	<i>d</i> 32'12	<i>d</i> 32'20	
	35'03	34'50	35'56	35'17	32'37	32'47	32'45	33'06	
(IV) & (I)	<i>h</i> 60'90	<i>h</i> 62'90	<i>h</i> 59'44	<i>h</i> 61'18	<i>h</i> 64'04	<i>h</i> 64'22	<i>h</i> 62'14	<i>h</i> 64'56	<i>M</i> = 62''·47 <i>w</i> = 3·11 $\frac{1}{w}$ = 0·32 <i>C</i> = 12° 9' 62''·47
	<i>h</i> 61'52	<i>h</i> 62'94	<i>h</i> 60'38	<i>h</i> 61'96	<i>h</i> 63'96	<i>h</i> 63'14	<i>h</i> 63'62	<i>h</i> 64'20	
	<i>h</i> 60'28	<i>h</i> 62'28	<i>d</i> 59'80		<i>h</i> 62'98	<i>h</i> 63'00	<i>h</i> 63'12	<i>d</i> 65'17	
	60'90	62'71	59'87	61'57	63'66	63'45	62'96	64'64	
(I) & (VII)	<i>h</i> 21'48	<i>h</i> 22'74	<i>h</i> 22'02	<i>h</i> 21'28	<i>h</i> 18'42	<i>h</i> 19'30	<i>h</i> 21'92	<i>h</i> 18'30	<i>M</i> = 21''·00 <i>w</i> = 3·04 $\frac{1}{w}$ = 0·33 <i>C</i> = 31° 20' 21''·00
	<i>h</i> 22'36	<i>h</i> 22'44	<i>h</i> 22'94	<i>d</i> 20'33	<i>h</i> 20'26	<i>h</i> 20'60	<i>h</i> 21'82	<i>h</i> 18'40	
	<i>h</i> 24'50	<i>h</i> 21'96	<i>h</i> 22'46	<i>d</i> 20'71	<i>d</i> 19'43	<i>h</i> 18'48	<i>h</i> 21'32	<i>d</i> 19'14	
			<i>d</i> 22'36	<i>d</i> 21'71				<i>d</i> 19'53	
	22'78	22'38	22'45	21'01	19'37	19'46	21'69	18'84	
(VII) & (III)	<i>h</i> 51'66	<i>h</i> 51'40	<i>h</i> 50'60	<i>h</i> 51'06	<i>h</i> 54'48	<i>h</i> 53'66	<i>h</i> 52'22	<i>h</i> 54'46	<i>M</i> = 52''·83 <i>w</i> = 6·53 $\frac{1}{w}$ = 0·15 <i>C</i> = 40° 4' 52''·84
	<i>h</i> 52'72	<i>h</i> 51'48	<i>h</i> 52'24	<i>h</i> 52'34	<i>h</i> 55'30	<i>h</i> 53'08	<i>h</i> 52'40	<i>h</i> 54'50	
	<i>h</i> 52'26	<i>h</i> 52'36	<i>h</i> 53'66	<i>h</i> 52'28	<i>h</i> 53'08	<i>h</i> 53'52	<i>h</i> 52'48	<i>h</i> 53'50	
			<i>d</i> 52'06	<i>d</i> 51'79	<i>d</i> 54'38			<i>d</i> 55'07	
				<i>d</i> 52'79					
	52'21	51'75	52'14	52'05	54'31	53'42	52'37	54'38	
<i>At (III)</i>									
<i>December 1836, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (V)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	332° 49'	152° 49'	341° 50'	161° 50'	350° 49'	170° 49'	359° 49'	179° 49'	
(V) & (II)	"	"	"	"	"	"	"	"	<i>M</i> = 6''·42 <i>w</i> = 11·28 $\frac{1}{w}$ = 0·09 <i>C</i> = 11° 55' 6''·42
	<i>d</i> 6'81	<i>d</i> 7'02	<i>d</i> 7'43	<i>d</i> 6'16	<i>h</i> 5'86	<i>h</i> 8'02	<i>h</i> 7'32	<i>h</i> 4'94	
	<i>d</i> 7'15	<i>d</i> 6'08	<i>d</i> 6'53	<i>d</i> 7'32	<i>h</i> 5'46	<i>h</i> 7'24	<i>d</i> 5'71	<i>h</i> 5'50	
	<i>d</i> 6'95	<i>d</i> 6'14	<i>d</i> 7'23	<i>d</i> 7'64	<i>h</i> 6'16	<i>h</i> 6'16	<i>d</i> 3'93	<i>h</i> 5'28	
	6'97	6'41	7'06	7'04	5'83	7'14	5'65	5'24	

OBSERVED ANGLES.

(11)

At (III)—(Continued.)									
<i>December 1836, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (V)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	332° 49'	152° 49'	341° 50'	161° 50'	350° 49'	170° 49'	359° 49'	179° 49'	
(II) & R M	"	"	"	"	"	"	"	"	<i>M</i> = 24'' 81 <i>w</i> = 6 66 $\frac{1}{w}$ = 0 15 <i>C</i> = 15° 17' 24'' 82
	<i>h</i> 23' 30	<i>h</i> 25' 68	<i>l</i> 24' 92	<i>l</i> 24' 80	<i>h</i> 23' 74	<i>h</i> 23' 94	<i>h</i> 25' 98	<i>h</i> 26' 42	
	<i>h</i> 24' 20	<i>h</i> 25' 66	<i>l</i> 22' 10	<i>l</i> 24' 14	<i>h</i> 24' 00	<i>h</i> 24' 24	<i>h</i> 26' 46	<i>h</i> 24' 94	
	<i>h</i> 24' 34	<i>h</i> 25' 58	<i>l</i> 23' 62	<i>l</i> 26' 18	<i>h</i> 23' 76	<i>h</i> 25' 42	<i>l</i> 27' 64	<i>h</i> 24' 76	
	23' 95	25' 64	23' 55	25' 04	23' 83	24' 53	26' 53	25' 37	
R M & (I)	<i>h</i> 6' 88	<i>h</i> 6' 98	<i>l</i> 5' 84	<i>l</i> 5' 38	<i>h</i> 7' 14	<i>h</i> 4' 22	<i>h</i> 5' 38	<i>h</i> 4' 06	<i>M</i> = 5'' 86 <i>w</i> = 7 23 $\frac{1}{w}$ = 0 14 <i>C</i> = 19° 38' 5'' 85
	<i>h</i> 6' 14	<i>h</i> 5' 86	<i>l</i> 6' 94	<i>l</i> 5' 32	<i>h</i> 7' 10	<i>h</i> 5' 40	<i>h</i> 5' 82	<i>h</i> 5' 58	
	<i>h</i> 6' 94	<i>h</i> 7' 40	<i>l</i> 5' 92	<i>l</i> 5' 48	<i>h</i> 7' 16	<i>h</i> 4' 34	<i>h</i> 5' 98	<i>l</i> 3' 38	
							<i>l</i> 4' 54		
							<i>d</i> 4' 03		
	6' 65	6' 75	6' 23	5' 39	7' 13	4' 65	5' 73	4' 32	
(I) & (IV)	<i>d</i> 20' 85	<i>d</i> 20' 41	<i>l</i> 21' 34	<i>l</i> 20' 32	<i>d</i> 18' 99	<i>d</i> 18' 67	<i>d</i> 18' 41	<i>l</i> 21' 84	<i>M</i> = 20'' 09 <i>w</i> = 6 68 $\frac{1}{w}$ = 0 15 <i>C</i> = 15° 45' 20'' 08
	<i>d</i> 21' 07	<i>d</i> 19' 75	<i>l</i> 20' 60	<i>l</i> 20' 48	<i>d</i> 18' 67	<i>d</i> 20' 07	<i>d</i> 20' 57	<i>l</i> 19' 70	
	<i>d</i> 21' 87	<i>d</i> 19' 31	<i>l</i> 22' 56	<i>l</i> 19' 42	<i>d</i> 19' 57	<i>d</i> 20' 63	<i>d</i> 17' 53	<i>d</i> 20' 41	
				<i>d</i> 18' 01					
	21' 26	19' 82	21' 50	20' 07	18' 81	19' 79	18' 84	20' 65	
(IV) & (VII)	<i>d</i> 27' 38	<i>d</i> 28' 90	<i>l</i> 30' 20	<i>l</i> 30' 98	<i>h</i> 30' 22	<i>d</i> 31' 29	<i>d</i> 31' 34	<i>d</i> 30' 23	<i>M</i> = 30'' 68 <i>w</i> = 4 72 $\frac{1}{w}$ = 0 21 <i>C</i> = 18° 59' 30'' 68
	<i>d</i> 29' 48	<i>d</i> 29' 68	<i>l</i> 31' 72	<i>l</i> 31' 68	<i>d</i> 30' 23	<i>d</i> 33' 39	<i>d</i> 31' 40	<i>d</i> 31' 49	
	<i>d</i> 29' 62	<i>d</i> 28' 54	<i>l</i> 30' 14	<i>l</i> 31' 66	<i>d</i> 30' 49	<i>d</i> 32' 80	<i>d</i> 31' 33	<i>d</i> 32' 09	
	28' 83	29' 04	30' 69	31' 44	30' 31	32' 49	31' 36	31' 27	
At (IV)									
<i>January 1837, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (VII)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	140° 44'	320° 43'	149° 43'	329° 43'	158° 43'	338° 43'	167° 43'	347° 43'	
(VII) & (III)	"	"	"	"	"	"	"	"	<i>M</i> = 32'' 96 <i>w</i> = 3 48 $\frac{1}{w}$ = 0 29 <i>C</i> = 16° 43' 32'' 95
	<i>l</i> 32' 66	<i>h</i> 32' 84	<i>h</i> 33' 38	<i>l</i> 34' 02	<i>h</i> 34' 20	<i>l</i> 33' 82	<i>h</i> 33' 46	<i>h</i> 30' 48	
	<i>l</i> 32' 16	<i>h</i> 30' 38	<i>h</i> 31' 44	<i>l</i> 33' 94	<i>h</i> 34' 64	<i>l</i> 34' 36	<i>l</i> 33' 26	<i>h</i> 30' 98	
	<i>l</i> 32' 84	<i>h</i> 32' 84	<i>d</i> 31' 60	<i>h</i> 34' 34	<i>d</i> 36' 04			<i>h</i> 29' 80	
	32' 55	32' 02	32' 14	34' 10	34' 96	34' 09	33' 36	30' 42	

<i>At (IV)—(Continued.)</i>									
<i>January 1837, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (VII)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	140° 44'	320° 43'	149° 43'	329° 43'	158° 43'	338° 43'	167° 43'	347° 43'	
(III) & (VI)	"	"	"	"	"	"	"	"	<i>M</i> = 4''·62 <i>w</i> = 5·21 $\frac{1}{w}$ = 0·19 <i>C</i> = 18° 17' 4''·62
	<i>l</i> 4·82 <i>l</i> 4·68 <i>l</i> 5·88	<i>h</i> 5·62 <i>h</i> 3·78 <i>d</i> 4·80	<i>h</i> 4·12 <i>h</i> 6·24 <i>d</i> 4·37	<i>l</i> 2·18 <i>l</i> 3·68 <i>d</i> 2·05	<i>h</i> 3·94 <i>h</i> 4·06 <i>l</i> 4·38 <i>d</i> 5·75	<i>l</i> 4·24 <i>l</i> 2·70 <i>h</i> 2·62	<i>h</i> 5·78 <i>l</i> 6·04 <i>l</i> 6·24	<i>h</i> 4·92 <i>h</i> 6·64 <i>l</i> 5·78	
	5·13	4·73	4·91	2·64	4·53	3·19	6·02	5·78	
(VI) & (I)	<i>l</i> 9·18 <i>l</i> 8·32 <i>l</i> 8·82	<i>h</i> 7·12 <i>h</i> 7·64 <i>d</i> 7·48 <i>d</i> 5·62	<i>h</i> 8·98 <i>h</i> 8·56 <i>h</i> 8·32	<i>l</i> 9·34 <i>l</i> 9·24 <i>l</i> 8·50	<i>h</i> 7·50 <i>h</i> 7·42 <i>d</i> 7·90 <i>d</i> 9·23	<i>l</i> 8·76 <i>l</i> 9·60 <i>d</i> 10·44	<i>h</i> 6·74 <i>l</i> 6·00 <i>l</i> 6·68	<i>h</i> 9·24 <i>h</i> 7·66 <i>h</i> 8·28	<i>M</i> = 8''·23 <i>w</i> = 6·60 $\frac{1}{w}$ = 0·15 <i>C</i> = 13° 15' 8''·23
		8·77	6·97	8·62	9·03	8·01	9·60	6·47	
(I) & (II)	<i>l</i> 41·26 <i>l</i> 39·92 <i>l</i> 39·92	<i>h</i> 40·26 <i>h</i> 39·86 <i>h</i> 40·60 <i>d</i> 38·45	<i>h</i> 41·22 <i>h</i> 40·76 <i>h</i> 41·32	<i>l</i> 40·88 <i>l</i> 40·56 <i>l</i> 39·92	<i>h</i> 40·74 <i>h</i> 40·02 <i>d</i> 40·82 <i>d</i> 37·47	<i>l</i> 39·90 <i>l</i> 37·46 <i>d</i> 40·40	<i>h</i> 40·16 <i>l</i> 40·92 <i>l</i> 40·40	<i>h</i> 37·78 <i>h</i> 38·18 <i>h</i> 37·84	<i>M</i> = 39''·89 <i>w</i> = 6·88 $\frac{1}{w}$ = 0·15 <i>C</i> = 14° 11' 39''·89
		40·37	39·79	41·10	40·45	39·76	39·25	40·49	
(II) & (V)	<i>l</i> 8·78 <i>l</i> 12·60 <i>l</i> 10·68	<i>h</i> 10·26 <i>h</i> 11·34 <i>d</i> 9·01	<i>h</i> 9·42 <i>h</i> 9·64 <i>h</i> 10·28	<i>l</i> 11·30 <i>l</i> 10·10 <i>l</i> 10·74	<i>h</i> 11·98 <i>l</i> 12·40 <i>d</i> 11·98 <i>d</i> 9·06	<i>l</i> 12·00 <i>l</i> 15·68 <i>h</i> 10·64	<i>h</i> 10·36 <i>l</i> 12·78 <i>l</i> 12·42	<i>h</i> 10·82 <i>h</i> 10·84 <i>h</i> 11·22	<i>M</i> = 11''·04 <i>w</i> = 5·83 $\frac{1}{w}$ = 0·17 <i>C</i> = 25° 27' 11''·04
		10·69	10·20	9·78	10·71	11·36	12·77	11·85	

At (V)									
<i>January 1837, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (IV)								M = Mean of Groups w = Relative Weight C = Concluded Angle
	317° 23'	137° 23'	326° 23'	146° 23'	335° 23'	155° 22'	344° 23'	164° 22'	
(IV) & (VII)	"	"	"	"	"	"	"	"	M = 54'' 95 w = 11 88 $\frac{1}{w}$ = 0 08 C = 24° 43' 54'' 95
	h 55' 76 h 53' 94 d 53' 99	d 54' 07 d 54' 98 d 53' 58	d 56' 10 d 54' 58 d 56' 30	d 55' 22 d 55' 20 d 53' 58	l 54' 48 h 55' 86 d 55' 28 d 55' 72	h 55' 94 h 55' 92 h 55' 84	h 52' 70 d 55' 05 d 54' 11	d 55' 04 d 54' 20 d 56' 58	
	54' 56	54' 21	55' 66	54' 67	55' 34	55' 90	53' 95	55' 27	
(VII) & (II)	h 20' 82 d 19' 61 d 19' 53 d 20' 25 d 19' 19	d 16' 97 d 21' 65 d 20' 61 d 19' 99	d 17' 65 d 18' 67 d 20' 95 d 18' 33	d 20' 77 d 19' 55 d 20' 05	l 19' 04 h 20' 52 h 19' 12 d 19' 45 d 20' 04	h 20' 22 h 18' 62 h 18' 46	h 19' 26 d 18' 63 d 18' 01 d 19' 41 d 20' 71	d 20' 91 d 19' 67 d 19' 05 d 18' 53	M = 19'' 52 w = 18 80 $\frac{1}{w}$ = 0 05 C = 7° 41' 19'' 52
	19' 88	19' 81	18' 90	20' 12	19' 63	19' 10	19' 20	19' 54	
(II) & R M	h 54' 52 h 54' 30 h 54' 72 d 53' 49	l 54' 50 l 54' 54 l 56' 04	l 53' 22 l 53' 74 l 53' 58	l 55' 52 l 54' 68 l 54' 88	l 54' 54 h 53' 38 h 54' 48 d 54' 02 d 54' 62	h 53' 92 h 55' 08 h 55' 46	h 56' 46 l 56' 16 l 56' 62 d 55' 83	l 56' 78 l 56' 80 l 55' 36	M = 54'' 93 w = 7 68 $\frac{1}{w}$ = 0 13 C = 10° 13' 54'' 93
	54' 26	55' 03	53' 51	55' 03	54' 21	54' 82	56' 27	56' 31	
R M & (III)	h 50' 68 h 50' 52 h 49' 66	l 50' 70 l 51' 50 l 51' 94 d 50' 13	l 52' 60 l 52' 30 l 53' 12	l 50' 14 l 50' 36 l 50' 34	l 51' 40 l 49' 88 h 51' 56	h 52' 38 l 50' 96 l 52' 10 d 51' 92	h 50' 92 l 48' 54 l 51' 08 l 50' 48 d 50' 02	l 51' 18 l 50' 24 l 50' 02	M = 50'' 97 w = 9 03 $\frac{1}{w}$ = 0 11 C = 3° 33' 50'' 97
	50' 29	51' 07	52' 67	50' 28	50' 95	51' 84	50' 21	50' 48	
(III) & (VI)	h 23' 00 h 22' 80 h 24' 54	l 22' 20 l 23' 80 l 20' 22 d 20' 82	l 22' 66 l 23' 18 l 22' 80	l 22' 80 l 23' 52 l 23' 62	l 23' 40 l 24' 66 h 23' 48	h 21' 38 d 21' 21 d 21' 77	h 20' 98 l 23' 68 d 21' 45 d 21' 80	l 22' 84 l 23' 72 l 23' 50	M = 22'' 75 w = 7 94 $\frac{1}{w}$ = 0 13 C = 12° 53' 22'' 74
	23' 45	21' 76	22' 88	23' 31	23' 85	21' 45	21' 98	23' 35	

<i>At (VI)</i>									
<i>December 1836, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (V)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	125° 32'	305° 32'	134° 30'	314° 30'	143° 30'	323° 30'	152° 30'	332° 30'	
(V) & (IV)	"	"	"	"	"	"	"	"	<i>M</i> = 38''·42 <i>w</i> = 8·65 $\frac{1}{w}$ = 0·12 <i>C</i> = 67° 59' 38''·42
	l 38'52	h 39'24	l 39'76	h 38'32	l 38'82	l 37'22	h 37'56	h 39'32	
	l 38'34	h 39'32	l 40'12	h 37'48	l 37'44	l 37'50	h 38'44	d 38'96	
		l 38'66	l 39'98	h 37'32	l 37'78	l 36'16	h 39'48		
		d 37'42							
		d 38'64							
	38'43	38'66	39'95	37'71	38'01	36'96	38'49	39'14	
(IV) & (VII)	h 14'24	h 14'60	l 13'00	h 13'30	l 12'78	l 15'52	h 17'88	h 14'00	<i>M</i> = 13''·90 <i>w</i> = 5·64 $\frac{1}{w}$ = 0·18 <i>C</i> = 25° 8' 13''·90
	d 14'40	l 13'78	l 13'02	h 13'56	l 12'54	l 15'06	h 15'04	h 13'38	
		d 14'17	l 11'22	h 13'50	l 12'88	l 13'84	h 15'14	h 14'56	
	14'32	14'18	12'41	13'45	12'73	14'14	16'02	13'98	
<i>At (VII)</i>									
<i>December 1836, and January 1837, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (III)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	10° 29'	190° 29'	19° 29'	199° 29'	28° 29'	208° 29'	37° 29'	217° 29'	
(III) & (VI)	"	"	"	"	"	"	"	"	<i>M</i> = 47''·99 <i>w</i> = 10·94 $\frac{1}{w}$ = 0·09 <i>C</i> = 24° 25' 47''·96
	h 46'24	h 48'08	h 49'50	h 48'88	h 48'28	d 46'75	h 48'22	h 47'30	
	h 47'54	h 47'48	h 50'28	h 47'72	h 48'30	d 47'91	h 49'24	h 47'94	
	h 49'24	h 47'44	h 47'46	h 47'96	d 48'55	d 47'21	h 48'40	h 48'30	
		d 48'55			d 48'56			d 46'92	
		d 48'65						d 45'60	
		d 44'50							
	47'67	47'45	49'08	48'19	48'42	47'29	48'62	47'21	



<i>At (VII)—(Continued.)</i>									
<i>December 1836, and January 1837, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (III)								<i>M</i> = Mean of groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	10° 29'	190° 29'	19° 29'	199° 29'	28° 29'	208° 29'	37° 29'	217° 29'	
(VI) & (II)	"	"	"	"	"	"	"	"	<i>M</i> = 59''·24 <i>w</i> = 3·53 $\frac{1}{w}$ = 0·28 <i>C</i> = 45° 48' 59''·22
	<i>h</i> 58·74	<i>h</i> 58·66	<i>h</i> 57·36	<i>h</i> 58·56	<i>h</i> 58·12	<i>h</i> 62·12	<i>h</i> 60·18	<i>h</i> 61·76	
	<i>h</i> 58·86	<i>d</i> 60·10	<i>h</i> 57·42	<i>h</i> 58·56	<i>h</i> 58·52	<i>h</i> 61·74	<i>h</i> 59·60	<i>h</i> 60·54	
	<i>h</i> 56·30	<i>d</i> 60·26	<i>h</i> 58·74	<i>h</i> 58·38	<i>d</i> 58·50		<i>h</i> 59·08	<i>d</i> 60·22	
		<i>d</i> 60·36						<i>d</i> 61·21	
		<i>d</i> 56·31						<i>d</i> 58·91	
	57·97	59·14	57·84	58·50	58·38	61·93	59·62	60·53	
(II) & (V)	<i>h</i> 40·44	<i>d</i> 40·65	<i>h</i> 43·40	<i>h</i> 43·00	<i>h</i> 42·40	<i>d</i> 41·64	<i>h</i> 39·86	<i>h</i> 42·98	<i>M</i> = 41''·71 <i>w</i> = 3·38 $\frac{1}{w}$ = 0·30 <i>C</i> = 6° 40' 41''·69
	<i>h</i> 42·50	<i>d</i> 42·09	<i>h</i> 41·88	<i>h</i> 44·38	<i>d</i> 43·07		<i>h</i> 40·72	<i>h</i> 41·08	
	<i>h</i> 42·88	<i>d</i> 37·51	<i>h</i> 42·64	<i>h</i> 43·68	<i>d</i> 42·25		<i>h</i> 40·40	<i>d</i> 42·40	
		<i>d</i> 38·25						<i>d</i> 40·13	
		<i>d</i> 37·73							
	41·94	39·25	42·64	43·69	42·57	41·64	40·33	41·65	
(V) & (IV)	<i>h</i> 30·08	<i>h</i> 30·76	<i>h</i> 28·68	<i>h</i> 28·34	<i>h</i> 25·16	<i>d</i> 26·66	<i>h</i> 29·08	<i>h</i> 26·46	<i>M</i> = 28''·15 <i>w</i> = 3·30 $\frac{1}{w}$ = 0·30 <i>C</i> = 67° 21' 28''·17
	<i>h</i> 27·70	<i>h</i> 30·34	<i>h</i> 28·78	<i>h</i> 27·54	<i>d</i> 27·63		<i>h</i> 28·66	<i>d</i> 26·01	
	<i>h</i> 28·14		<i>h</i> 28·54	<i>h</i> 28·04	<i>d</i> 27·78		<i>h</i> 30·80	<i>d</i> 26·61	
	28·64	30·55	28·67	27·97	26·86	26·66	29·51	26·36	

## BASE-LINE FIGURES—DEHRA DOON.

## OBSERVED ANGLES.



<i>At (VIII)</i>									
<i>April 1835, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (XI)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	9° 0'	189° 1'	18° 1'	198° 1'	27° 1'	207° 2'	
(XI) & (X)	"	"	"	"	"	"	"	"	"
	<i>h</i> 50°12	<i>h</i> 49°54	<i>h</i> 47°06	<i>h</i> 50°48	<i>h</i> 51°54	<i>h</i> 49°90	<i>h</i> 47°24	<i>h</i> 49°50	<i>M</i> = 48''·57  <i>w</i> = 9·28  $\frac{1}{w}$ = 0·11  <i>C</i> = 113° 26' 48''·57
	<i>h</i> 47°50	<i>h</i> 47°04	<i>h</i> 46°80	<i>h</i> 48°70	<i>h</i> 48°48	<i>h</i> 49°02	<i>h</i> 48°80	<i>h</i> 47°98	
	<i>h</i> 48°00	<i>h</i> 48°30	<i>h</i> 47°34	<i>h</i> 48°46	<i>h</i> 47°90	<i>h</i> 48°96	<i>h</i> 49°18	<i>h</i> 47°74	
	48°54	48°29	47°07	49°21	49°31	49°29	48°41	48°41	
(X) & (IX)	<i>h</i> 51°82	<i>h</i> 49°08	<i>h</i> 51°98	<i>h</i> 47°66	<i>h</i> 47°42	<i>h</i> 51°62	<i>h</i> 50°00	<i>h</i> 49°32	<i>M</i> = 49''·94  <i>w</i> = 4·56  $\frac{1}{w}$ = 0·22  <i>C</i> = 71° 41' 49''·94
	<i>h</i> 52°70	<i>h</i> 49°50	<i>h</i> 49°56	<i>h</i> 51°50	<i>h</i> 54°06	<i>h</i> 50°64	<i>h</i> 49°30	<i>h</i> 49°66	
	<i>h</i> 51°10	<i>h</i> 50°36	<i>h</i> 46°42	<i>h</i> 47°34	<i>h</i> 50°26	<i>h</i> 49°20	<i>h</i> 49°42	<i>h</i> 48°72	
		51°87	49°65	49°32	48°83	50°58	50°49	49°57	49°23

<i>At (IX)</i>									
<i>April 1835, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (XI)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	9° 0'	189° 0'	17° 54'	197° 54'	27° 1'	207° 1'	
(XI) & (VIII)	"	"	"	"	"	"	"	"	<i>M</i> = 63".47 <i>w</i> = 2.88 $\frac{1}{w}$ = 0.35 <i>C</i> = 3° 3' 63".47
	<i>h</i> 65.34	<i>h</i> 63.62	<i>h</i> 62.20	<i>h</i> 64.32	<i>h</i> 63.20	<i>h</i> 62.84	<i>h</i> 62.82	<i>h</i> 59.42	
	<i>h</i> 66.14	<i>h</i> 61.30	<i>h</i> 61.44	<i>h</i> 63.56	<i>h</i> 63.52	<i>h</i> 67.90	<i>h</i> 63.60	<i>h</i> 61.44	
	<i>h</i> 67.36	<i>h</i> 62.50	<i>h</i> 63.94	<i>h</i> 59.92	<i>d</i> 63.98	<i>h</i> 62.56	<i>h</i> 63.08	<i>h</i> 67.28	
	66.28	62.47	62.53	62.60	63.57	64.43	63.17	62.71	
(VIII) & (X)	<i>h</i> 37.26	<i>h</i> 36.38	<i>h</i> 40.66	<i>h</i> 38.08	<i>h</i> 39.10	<i>h</i> 39.16	<i>h</i> 37.06	<i>h</i> 41.60	<i>M</i> = 38".11 <i>w</i> = 4.20 $\frac{1}{w}$ = 0.24 <i>C</i> = 76° 36' 38".12
	<i>h</i> 35.84	<i>h</i> 38.82	<i>h</i> 41.44	<i>h</i> 35.38	<i>h</i> 36.32	<i>h</i> 36.20	<i>h</i> 40.10	<i>h</i> 40.70	
	<i>h</i> 37.30	<i>h</i> 38.14	<i>h</i> 38.62	<i>h</i> 37.36	<i>h</i> 38.58	<i>h</i> 38.86	<i>h</i> 38.04	<i>h</i> 34.28	
				<i>d</i> 38.62				<i>h</i> 37.48	
	36.80	37.78	40.24	36.94	38.16	38.07	38.40	38.52	
<i>At (X)</i>									
<i>June 1835, observed under the superintendence of Lieut.-Colonel G. Everest.</i>									
Angle between	Circle readings, telescope being set on (IX)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	299° 15'	119° 15'	308° 16'	128° 16'	317° 17'	137° 17'	326° 17'	146° 17'	
(IX) & (VIII)	"	"	"	"	"	"	"	"	<i>M</i> = 33".77 <i>w</i> = 5.36 $\frac{1}{w}$ = 0.19 <i>C</i> = 31° 41' 33".77
	<i>h</i> 34.56	<i>h</i> 33.90	<i>l</i> 37.42	<i>l</i> 32.94	<i>h</i> 32.82	<i>h</i> 33.96	<i>h</i> 31.58	<i>h</i> 35.02	
	<i>h</i> 34.54	<i>h</i> 38.32	<i>l</i> 33.14	<i>l</i> 32.12	<i>h</i> 33.34	<i>h</i> 33.48	<i>l</i> 32.78	<i>l</i> 35.00	
	<i>h</i> 33.28	<i>h</i> 32.04	<i>l</i> 32.72	<i>l</i> 34.48	<i>h</i> 33.96	<i>h</i> 31.72	<i>l</i> 32.48	<i>l</i> 34.84	
	34.13	34.75	34.43	33.18	33.37	33.05	32.28	34.95	
(VIII) & (XI)	<i>h</i> 9.68	<i>h</i> 10.34	<i>l</i> 9.80	<i>l</i> 9.46	<i>h</i> 9.72	<i>h</i> 11.26	<i>h</i> 9.70	<i>h</i> 8.80	<i>M</i> = 10".12 <i>w</i> = 9.76 $\frac{1}{w}$ = 0.10 <i>C</i> = 29° 3' 10".12
	<i>h</i> 9.22	<i>h</i> 9.06	<i>l</i> 7.58	<i>l</i> 13.38	<i>h</i> 10.12	<i>h</i> 9.62	<i>l</i> 11.48	<i>l</i> 11.46	
	<i>h</i> 9.68	<i>h</i> 12.40	<i>l</i> 9.22	<i>l</i> 9.68	<i>h</i> 9.66	<i>h</i> 10.48	<i>l</i> 11.06	<i>l</i> 9.90	
	9.53	10.60	8.87	10.84	9.83	10.45	10.75	10.05	

<i>At (XI)</i>										
<i>April 1835, observed under the superintendence of Lieut.-Colonel G. Everest.</i>										
Angle between	Circle readings, telescope being set on (X)								<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	0° 1'	180° 2'	9° 1'	189° 2'	18° 6'	198° 5'	26° 59'	206° 59'		
(X) & (VIII)	"	"	"	"	"	"	"	"	"	<i>M</i> = 60''·32 <i>w</i> = 4·80 $\frac{1}{w}$ = 0·21 <i>C</i> = 37°29'60''·33
	h 60°92	h 60°52	h 63°36	h 60°30	h 59°52	h 60°58	h 57°78	h 60°92		
	h 60°24	h 59°36	h 61°72	h 62°04	h 62°64	h 62°04	h 59°86	h 57°88		
	h 58°64	h 59°42	h 62°44	h 61°20	h 59°16	h 58°38	h 60°48	h 58°16		
		d 59°65	h 62°88							
	59°93	59°74	62°60	61°18	60°44	60°33	59°37	58°99		
(VIII) & (IX)	h 34°76	h 34°34	h 31°62	h 36°70	h 35°14	h 35°78	h 34°74	h 34°56	<i>M</i> = 34''·70 <i>w</i> = 6·48 $\frac{1}{w}$ = 0·15 <i>C</i> = 2° 4'34''·68	
	h 34°12	h 36°36	h 34°64	h 32°00	h 32°40	h 34°06	h 35°48	h 35°40		
	h 35°74	d 35°23	h 33°24	h 33°44	h 35°54	h 38°20	h 34°10	h 35°30		
			h 32°98							
	34°87	35°31	33°12	34°05	34°36	36°01	34°77	35°09		

## BASE-LINE FIGURES—CHACH.

## OBSERVED ANGLES.

At (XIII)

February 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on (XIV)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 24'	194° 24'	21° 37'	201° 37'	28° 48'	208° 48'	
(XIV) & (XV)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 43'' 67 <i>w</i> = 4 23 $\frac{1}{w}$ = 0 24 <i>C</i> = 66° 8' 43'' 66
	h 43° 90	h 43° 20	l 44° 70	h 44° 28	l 45° 06	l 46° 04	l 44° 40	l 44° 64	l 41° 00	l 42° 02	
	h 43° 26	h 41° 00	h 41° 58	l 45° 32	l 44° 60	l 46° 20	l 41° 50	l 44° 72	l 43° 50	l 44° 06	
	43° 58	42° 10	42° 37	44° 80	44° 83	46° 12	42° 95	44° 68	42° 25	43° 04	
(XV) & (XVII)	h 32° 28	h 32° 90	h 32° 20	l 36° 32	l 35° 02	l 34° 76	l 32° 78	l 33° 44	l 36° 02	l 35° 06	<i>M</i> = 33'' 94 <i>w</i> = 7 40 $\frac{1}{w}$ = 0 14 <i>C</i> = 75° 12' 33'' 94
	h 32° 42	h 35° 28	h 33° 10	l 35° 46	l 34° 22	l 33° 46	l 34° 74	l 33° 58	l 32° 80	l 32° 94	
	32° 35	34° 09	32° 65	35° 89	34° 62	34° 11	33° 76	33° 51	34° 41	34° 00	
At (XIV)											
January 1852, observed by Mr. G. Logan, with Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on (XVI)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
(XVI) & (XV)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 56'' 66 <i>w</i> = 3 51 $\frac{1}{w}$ = 0 28 <i>C</i> = 62° 8' 56'' 66
	h 54° 66	h 55° 90	l 57° 12	l 54° 90	l 54° 66	l 61° 16	l 56° 10	l 56° 70	l 57° 28	l 57° 85	
	h 55° 04	h 54° 68	l 55° 96	l 54° 88	l 56° 06	l 59° 16	l 56° 14	l 58° 14	l 57° 80	l 57° 48	
	54° 85	55° 29	56° 54	54° 89	56° 15	60° 16	56° 12	57° 42	57° 54	57° 67	

<i>At (XIV)—(Continued.)</i>											
<i>January 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XVI)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
(XV) & (XIII)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 20'' 05 <i>w</i> = 3 40 $\frac{1}{w}$ = 0 29 <i>C</i> = 81° 30' 20'' 05
	<i>h</i> 17 40	<i>h</i> 20 92	<i>l</i> 19 72	<i>l</i> 21 32	<i>l</i> 21 10	<i>l</i> 16 48	<i>l</i> 21 60	<i>l</i> 18 86	<i>l</i> 21 64	<i>l</i> 18 24	
	<i>h</i> 18 04	<i>h</i> 21 66	<i>l</i> 22 04	<i>l</i> 21 18	<i>l</i> 21 72	<i>l</i> 17 74	<i>l</i> 21 04	<i>l</i> 19 24	<i>l</i> 21 08	<i>l</i> 20 04	
	17 72	21 29	20 88	21 25	21 41	17 11	21 32	19 05	21 36	19 14	
<i>At (XV)</i>											
<i>January 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XVI)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 13'	14° 24'	194° 24'	21° 37'	201° 37'	28° 48'	208° 48'	
(XVI) & (XVIII)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 54'' 14 <i>w</i> = 6 40 $\frac{1}{w}$ = 0 16 <i>C</i> = 66° 20' 54'' 14
	<i>l</i> 53 64	<i>h</i> 51 18	<i>h</i> 54 62	<i>h</i> 56 02	<i>l</i> 54 64	<i>l</i> 54 52	<i>l</i> 55 00	<i>l</i> 53 42	<i>h</i> 54 52	<i>h</i> 53 74	
	<i>l</i> 54 48	<i>h</i> 51 96	<i>h</i> 54 80	<i>h</i> 52 86	<i>l</i> 56 42	<i>l</i> 55 74	<i>l</i> 53 80	<i>l</i> 54 40	<i>h</i> 54 12	<i>h</i> 53 32	
	<i>h</i> 52 12			<i>h</i> 55 78							
	53 41	51 57	54 71	54 89	55 53	55 13	54 40	53 91	54 32	53 53	
(XVIII) & (XIX)	<i>l</i> 13 22	<i>h</i> 11 60	<i>h</i> 10 66	<i>h</i> 9 76	<i>l</i> 10 04	<i>l</i> 8 96	<i>l</i> 11 50	<i>l</i> 13 40	<i>h</i> 9 52	<i>h</i> 10 78	<i>M</i> = 10'' 90 <i>w</i> = 6 42 $\frac{1}{w}$ = 0 16 <i>C</i> = 79° 50' 10'' 91
	<i>l</i> 12 36	<i>h</i> 10 86	<i>h</i> 9 16	<i>h</i> 9 92	<i>l</i> 10 92	<i>l</i> 9 46	<i>l</i> 12 40	<i>l</i> 11 74	<i>h</i> 10 66	<i>h</i> 11 30	
	<i>h</i> 12 42										
	12 67	11 23	9 91	9 84	10 48	9 21	11 95	12 57	10 09	11 04	
(XIX) (XVII)	<i>l</i> 3 18	<i>h</i> 4 46	<i>h</i> 3 94	<i>h</i> 6 64	<i>l</i> 3 92	<i>l</i> 7 06	<i>l</i> 4 06	<i>l</i> 4 76	<i>h</i> 4 62	<i>h</i> 3 92	<i>M</i> = 4'' 76 <i>w</i> = 7 02 $\frac{1}{w}$ = 0 14 <i>C</i> = 66° 6' 4'' 76
	<i>l</i> 2 54	<i>h</i> 4 50	<i>h</i> 5 62	<i>h</i> 6 84	<i>l</i> 4 46	<i>l</i> 6 08	<i>l</i> 4 18	<i>l</i> 4 82	<i>h</i> 5 30	<i>h</i> 5 10	
		<i>h</i> 3 46									
	2 86	4 48	4 34	6 74	4 19	6 57	4 12	4 79	4 96	4 51	

<i>At (XV)—(Continued.)</i>											
<i>January 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XVI)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 13'	14° 24'	194° 24'	21° 37'	201° 37'	28° 48'	208° 48'	
(XVII) & (XIII)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 18".01 <i>w</i> = 5.66 $\frac{1}{w}$ = 0.18 <i>C</i> = 57° 10' 18".01
	<i>l</i> 19.22	<i>h</i> 16.86	<i>h</i> 18.74	<i>h</i> 17.80	<i>l</i> 20.44	<i>l</i> 17.24	<i>l</i> 18.52	<i>l</i> 16.76	<i>h</i> 20.76	<i>h</i> 16.40	
	<i>l</i> 18.80	<i>h</i> 18.66	<i>h</i> 18.78	<i>h</i> 15.98	<i>l</i> 19.44	<i>l</i> 15.66	<i>l</i> 17.16	<i>l</i> 17.66	<i>h</i> 18.04	<i>h</i> 17.04	
		<i>h</i> 17.52	<i>h</i> 19.38								
	19.01	17.68	18.97	16.89	19.94	16.45	17.84	17.21	19.40	16.72	
(XIII) & (XIV)	<i>l</i> 57.34	<i>h</i> 56.62	<i>h</i> 56.60	<i>h</i> 55.82	<i>l</i> 56.00	<i>l</i> 57.56	<i>l</i> 57.64	<i>l</i> 56.88	<i>h</i> 55.42	<i>h</i> 59.24	<i>M</i> = 56".98 <i>w</i> = 8.59 $\frac{1}{w}$ = 0.12 <i>C</i> = 32° 20' 56".97
	<i>l</i> 55.58	<i>h</i> 53.84	<i>h</i> 56.48	<i>h</i> 57.16	<i>l</i> 57.30	<i>l</i> 56.90	<i>l</i> 58.34	<i>l</i> 57.24	<i>h</i> 57.08	<i>h</i> 58.84	
		<i>h</i> 57.84									
	56.46	56.10	56.54	56.49	56.65	57.23	57.99	57.06	56.25	59.04	
(XIV) & (XVI)	<i>l</i> 33.86	<i>h</i> 37.44	<i>h</i> 35.00	<i>h</i> 36.74	<i>l</i> 33.30	<i>l</i> 33.26	<i>l</i> 34.00	<i>l</i> 34.96	<i>h</i> 34.90	<i>h</i> 35.48	<i>M</i> = 35".12 <i>w</i> = 3.59 $\frac{1}{w}$ = 0.28 <i>C</i> = 58° 11' 35".16
	<i>l</i> 37.40	<i>h</i> 40.36	<i>h</i> 34.02	<i>h</i> 34.46	<i>l</i> 32.74	<i>l</i> 34.98	<i>l</i> 33.00	<i>l</i> 34.60	<i>h</i> 35.86	<i>h</i> 36.70	
	<i>h</i> 34.54	<i>h</i> 37.20		<i>h</i> 37.28							
	35.27	38.33	34.51	36.16	33.02	34.12	33.50	34.78	35.38	36.09	
<i>At (XVI)</i>											
<i>January 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XVIII)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
(XVIII) & (XV)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 46".61 <i>w</i> = 5.94 $\frac{1}{w}$ = 0.17 <i>C</i> = 74° 47' 46".61
	<i>h</i> 47.18	<i>h</i> 45.68	<i>h</i> 45.70	<i>h</i> 45.92	<i>h</i> 47.42	<i>h</i> 44.50	<i>l</i> 47.90	<i>l</i> 47.96	<i>l</i> 49.00	<i>l</i> 48.54	
	<i>h</i> 47.18	<i>h</i> 43.76	<i>h</i> 45.80	<i>h</i> 46.52	<i>h</i> 44.48	<i>h</i> 45.60	<i>l</i> 46.82	<i>l</i> 46.68	<i>l</i> 46.86	<i>l</i> 47.64	
				<i>h</i> 47.64							
	47.18	44.72	45.75	46.22	46.51	45.05	47.36	47.32	47.93	48.09	

At (XVI)—(Continued.)											
<i>January 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XVIII)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
(XV) & (XIV)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 28'' 74 <i>w</i> = 4 30 $\frac{1}{w}$ = 0 23 <i>C</i> = 59° 39' 28'' 74
	<i>h</i> 26° 62'	<i>h</i> 28° 36'	<i>h</i> 30° 38'	<i>h</i> 30° 82'	<i>h</i> 28° 72'	<i>h</i> 30° 54'	<i>l</i> 28° 84'	<i>l</i> 29° 14'	<i>l</i> 27° 14'	<i>l</i> 26° 56'	
	<i>h</i> 25° 98'	<i>h</i> 28° 34'	<i>h</i> 30° 90'	<i>h</i> 29° 40'	<i>h</i> 29° 82'	<i>h</i> 29° 84'	<i>l</i> 29° 48'	<i>l</i> 28° 84'	<i>l</i> 28° 70'	<i>l</i> 26° 42'	
	26° 30'	28° 35'	30° 64'	30° 11'	29° 27'	30° 19'	29° 16'	28° 99'	27° 92'	26° 49'	
At (XVII)											
<i>February 1852, observed by Mr. G. Logan, with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XIII)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
(XIII) & (XV)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 8'' 98 <i>w</i> = 3 92 $\frac{1}{w}$ = 0 26 <i>C</i> = 47° 37' 8'' 99
	<i>l</i> 9° 70'	<i>l</i> 6° 68'	<i>l</i> 6° 86'	<i>l</i> 7° 38'	<i>l</i> 7° 40'	<i>l</i> 12° 64'	<i>h</i> 9° 12'	<i>h</i> 10° 86'	<i>h</i> 8° 60'	<i>h</i> 10° 00'	
	<i>l</i> 7° 50'	<i>l</i> 7° 28'	<i>l</i> 7° 48'	<i>l</i> 8° 36'	<i>l</i> 10° 04'	<i>h</i> 9° 00'	<i>h</i> 9° 26'	<i>h</i> 11° 76'	<i>h</i> 9° 26'	<i>h</i> 9° 70'	
	8° 60'	6° 98'	7° 17'	7° 87'	8° 72'	11° 21'	9° 19'	11° 31'	8° 93'	9° 85'	
(XV) & (XIX)	<i>l</i> 48° 54'	<i>l</i> 46° 04'	<i>l</i> 45° 46'	<i>l</i> 47° 04'	<i>l</i> 47° 54'	<i>h</i> 44° 02'	<i>h</i> 44° 94'	<i>h</i> 44° 58'	<i>h</i> 47° 46'	<i>h</i> 47° 80'	<i>M</i> = 46'' 32 <i>w</i> = 5 93 $\frac{1}{w}$ = 0 17 <i>C</i> = 71° 50' 46'' 33
	<i>l</i> 48° 20'	<i>l</i> 45° 96'	<i>l</i> 45° 76'	<i>l</i> 48° 22'	<i>l</i> 46° 02'	<i>h</i> 44° 34'	<i>h</i> 46° 64'	<i>h</i> 45° 52'	<i>h</i> 45° 62'	<i>h</i> 47° 76'	
	<i>l</i> 46° 74'										
	47° 83'	46° 00'	45° 61'	47° 63'	46° 78'	44° 18'	45° 79'	45° 05'	46° 54'	47° 78'	
At (XVIII)											
<i>December 1851, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle reading, telescope being set on (XIX)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	154° 8'	334° 8'	161° 19'	341° 19'	168° 31'	348° 31'	175° 43'	355° 43'	182° 55'	2° 55'	
(XIX) & (XV)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 0'' 46 <i>w</i> = 10 90 $\frac{1}{w}$ = 0 09 <i>C</i> = 58° 17' 0'' 46
	<i>l</i> 61° 20'	<i>h</i> 61° 22'	<i>l</i> 59° 82'	<i>l</i> 60° 80'	<i>l</i> 59° 80'	<i>l</i> 59° 98'	<i>l</i> 60° 16'	<i>l</i> 58° 84'	<i>h</i> 62° 02'	<i>h</i> 61° 68'	
	<i>l</i> 61° 06'	<i>h</i> 60° 32'	<i>l</i> 58° 96'	<i>l</i> 59° 78'	<i>l</i> 59° 50'	<i>l</i> 60° 14'	<i>l</i> 60° 84'	<i>l</i> 59° 68'	<i>h</i> 62° 40'	<i>h</i> 60° 90'	
	61° 13'	60° 77'	59° 39'	60° 29'	59° 65'	60° 06'	60° 50'	59° 26'	62° 21'	61° 29'	



At (XVIII)—(Continued.)											
<i>December 1851, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XIX)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	154° 8'	884° 8'	161° 19'	841° 19'	168° 31'	348° 31'	175° 43'	355° 43'	182° 55'	2° 55'	
(XV) & (XVI)	"	"	"	"	"	"	"	"	"	"	M = 21'' 49 w = 12 '94 $\frac{1}{w}$ = 0 '08 C = 38° 51' 21'' 48
	l 22° 34'	l 21° 68'	l 21° 54'	l 21° 34'	l 20° 22'	l 21° 26'	l 22° 26'	l 23° 66'	h 21° 70'	h 17° 86'	
	l 21° 06'	l 21° 52'	l 20° 98'	l 21° 54'	l 21° 00'	l 21° 88'	l 20° 44'	h 20° 90'	h 22° 04'	h 22° 80'	
										h 23° 06'	
	21° 70'	21° 60'	21° 26'	21° 44'	20° 61'	21° 57'	21° 35'	22° 28'	21° 87'	21° 24'	
At (XIX)											
<i>January 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XVII)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
(XVII) & (XV)	"	"	"	"	"	"	"	"	"	"	M = 12'' 08 w = 6 '16 $\frac{1}{w}$ = 0 '16 C = 42° 3' 12'' 10
	h 12° 02'	h 10° 72'	h 11° 60'	h 10° 98'	l 15° 72'	l 15° 24'	h 10° 92'	h 12° 72'	l 10° 14'	l 12° 54'	
	h 11° 20'	h 12° 24'	h 10° 34'	l 12° 88'	l 12° 68'	l 13° 60'	h 11° 80'	h 10° 66'	l 12° 80'	l 11° 98'	
					l 12° 46'						
	11° 61'	11° 48'	10° 97'	11° 93'	13° 62'	14° 42'	11° 36'	11° 69'	11° 47'	12° 26'	
(XV) & (XVIII)	h 52° 08'	h 52° 56'	h 54° 12'	h 51° 86'	l 52° 56'	l 52° 32'	h 54° 14'	h 52° 56'	l 53° 90'	l 50° 80'	M = 52'' 69 w = 14 '56 $\frac{1}{w}$ = 0 '07 C = 41° 52' 52'' 70
	h 53° 02'	h 53° 08'	h 52° 28'	l 52° 88'	l 54° 18'	l 51° 84'	h 52° 14'	h 54° 16'	l 51° 02'	l 52° 16'	
					l 53° 42'						
	52° 55'	52° 82'	53° 20'	52° 37'	53° 39'	52° 08'	53° 14'	53° 36'	52° 46'	51° 48'	

## BASE-LINE FIGURES—KARACHI.

## OBSERVED ANGLES.



<i>At (XX)</i>											
<i>March 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XXII)										<i>M</i> = Mean of groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
(XXII) & R M	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 4''·61 <i>w</i> = 19·20 $\frac{1}{w}$ = 0·05 <i>C</i> = 74° 22' 4''·61
	<i>h</i> 4·38	<i>h</i> 3·60	<i>h</i> 3·92	<i>h</i> 4·70	<i>h</i> 5·40	<i>h</i> 5·08	<i>h</i> 4·66	<i>h</i> 3·46	<i>h</i> 5·62	<i>h</i> 4·82	
	<i>h</i> 5·50	<i>h</i> 4·28	<i>h</i> 3·74	<i>h</i> 4·34	<i>h</i> 4·92	<i>h</i> 5·50	<i>h</i> 5·66	<i>h</i> 3·58	<i>h</i> 5·18	<i>h</i> 3·88	
	4·94	3·94	3·83	4·52	5·16	5·29	5·16	3·52	5·40	4·35	
R M & (XXI)	<i>h</i> 59·44	<i>h</i> 59·62	<i>h</i> 58·98	<i>h</i> 59·36	<i>h</i> 59·38	<i>h</i> 59·74	<i>h</i> 61·06	<i>h</i> 59·76	<i>h</i> 60·00	<i>h</i> 59·74	<i>M</i> = 59''·77 <i>w</i> = 45·50 $\frac{1}{w}$ = 0·02 <i>C</i> = 0° 4' 59''·77
	<i>h</i> 59·10	<i>h</i> 59·66	<i>h</i> 59·38	<i>h</i> 59·54	<i>h</i> 60·42	<i>h</i> 60·20	<i>h</i> 60·22	<i>h</i> 60·18	<i>h</i> 59·78	<i>h</i> 59·86	
	59·27	59·64	59·18	59·45	59·90	59·97	60·64	59·97	59·89	59·80	
(XXI) & (XXIII)	<i>h</i> 54·30	<i>h</i> 54·24	<i>h</i> 54·88	<i>h</i> 54·20	<i>h</i> 54·98	<i>h</i> 54·68	<i>h</i> 53·70	<i>h</i> 54·52	<i>h</i> 54·40	<i>h</i> 53·12	<i>M</i> = 54''·19 <i>w</i> = 34·50 $\frac{1}{w}$ = 0·03 <i>C</i> = 55° 39' 54''·19
	<i>h</i> 53·70	<i>h</i> 53·78	<i>h</i> 54·90	<i>h</i> 54·84	<i>h</i> 54·26	<i>h</i> 54·44	<i>h</i> 53·04	<i>h</i> 53·28	<i>h</i> 54·20	<i>h</i> 54·34	
	54·00	54·01	54·89	54·52	54·62	54·56	53·37	53·90	54·30	53·73	

At (XXI)

February and March 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with  
Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on (XX)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
(XX) & (XXII)	l 47° 50'	l 49° 00'	h 47° 48'	h 48° 70'	l 48° 36'	l 44° 92'	h 47° 40'	h 47° 40'	l 45° 86'	l 48° 72'	<i>M</i> = 47° 32' <i>w</i> = 5.48 $\frac{1}{w}$ = 0.18 <i>C</i> = 67° 34' 47" 32
	l 47° 76'	l 46° 72'	h 46° 88'	h 49° 14'	l 48° 98'	l 44° 66'	h 47° 92'	h 47° 50'	l 45° 76'	l 49° 28'	
		l 46° 28'								l 45° 26'	
	47° 63	47° 33	47° 18	48° 92	48° 67	44° 79	47° 66	47° 45	45° 81	47° 75	
(XXII) & (XXIV)	h 3° 30'	l 1° 48'	h 5° 76'	h 3° 94'	l 0° 48'	l 5° 06'	h 5° 30'	h 6° 42'	l 0° 78'	l 1° 94'	<i>M</i> = 4° 04' <i>w</i> = 4.46 $\frac{1}{w}$ = 0.22 <i>C</i> = 59° 16' 4" 00
	l 4° 66'	l 5° 34'	h 6° 28'	h 4° 12'	l 2° 76'	l 4° 28'	h 3° 98'	h 5° 28'	l 3° 80'	l 1° 82'	
		l 4° 46'			l 2° 72'				l 3° 20'	l 4° 94'	
	3° 98	3° 76	6° 02	4° 03	1° 99	4° 67	4° 64	5° 85	2° 59	2° 90	
(XXIV) & (XXV)	h 39° 44'	l 41° 42'	h 39° 10'	h 40° 78'	l 41° 84'	l 38° 98'	h 37° 22'	h 37° 86'	l 39° 36'	l 42° 02'	<i>M</i> = 39° 13' <i>w</i> = 6.94 $\frac{1}{w}$ = 0.14 <i>C</i> = 66° 34' 39" 17
	h 38° 54'	l 37° 68'	h 38° 02'	h 39° 02'	l 38° 78'	l 39° 92'	h 37° 52'	h 38° 50'	l 37° 22'	l 38° 02'	
		l 41° 30'			l 40° 48'				l 39° 70'	l 38° 74'	
	38° 99	40° 13	38° 56	39° 90	40° 37	39° 45	37° 37	38° 18	38° 76	39° 59	
(XXV) & (XXIII)	h 19° 36'	l 19° 58'	h 18° 86'	h 18° 68'	l 19° 10'	l 20° 92'	h 21° 18'	h 20° 32'	l 22° 20'	l 20° 34'	<i>M</i> = 20° 23' <i>w</i> = 7.33 $\frac{1}{w}$ = 0.14 <i>C</i> = 79° 49' 20" 23
	h 20° 06'	l 17° 72'	h 19° 08'	h 19° 84'	l 21° 40'	l 20° 70'	h 21° 18'	h 20° 16'	l 22° 32'	l 21° 06'	
					l 20° 94'						
	19° 71	18° 65	18° 97	19° 26	20° 48	20° 81	21° 18	20° 24	22° 26	20° 70	
(XXIII) & (XX)	l 5° 48'	l 10° 56'	h 9° 14'	h 8° 08'	l 12° 02'	l 10° 00'	h 9° 46'	h 8° 20'	l 9° 46'	l 10° 54'	<i>M</i> = 9° 23' <i>w</i> = 6.30 $\frac{1}{w}$ = 0.16 <i>C</i> = 86° 45' 9" 22
	l 8° 42'	l 10° 98'	h 9° 60'	h 8° 04'	l 9° 14'	l 10° 94'	h 8° 74'	h 9° 08'	l 9° 42'	l 8° 68'	
	l 6° 96'				l 8° 62'						
	6° 95	10° 77	9° 37	8° 06	9° 93	10° 47	9° 10	8° 64	9° 44	9° 61	

<i>At (XXII)</i>											
<i>April 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XXIV)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 12'	14° 25'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
(XXIV) & (XXI)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 0°.84 <i>w</i> = 11.00 $\frac{1}{w}$ = 0.09 <i>C</i> = 75° 59' 0°.84
	<i>h</i> 60° 06'	<i>h</i> 59° 48'	<i>h</i> 59° 48'	<i>h</i> 60° 12'	<i>h</i> 60° 78'	<i>h</i> 62° 94'	<i>l</i> 60° 48'	<i>l</i> 61° 46'	<i>l</i> 61° 50'	<i>l</i> 61° 90'	
	<i>h</i> 60° 82'	<i>h</i> 59° 94'	<i>h</i> 60° 56'	<i>h</i> 59° 78'	<i>h</i> 61° 70'	<i>h</i> 62° 78'	<i>l</i> 60° 26'	<i>l</i> 60° 56'	<i>l</i> 61° 12'	<i>l</i> 60° 26'	
	60° 89	59° 71	60° 02	59° 95	61° 24	62° 86	60° 37	61° 01	61° 31	61° 08	
(XXI) & (XX)	<i>h</i> 8° 26'	<i>h</i> 8° 24'	<i>h</i> 8° 60'	<i>h</i> 9° 08'	<i>h</i> 7° 28'	<i>h</i> 7° 10'	<i>l</i> 7° 40'	<i>l</i> 8° 36'	<i>l</i> 6° 44'	<i>l</i> 7° 92'	<i>M</i> = 7".71 <i>w</i> = 14.10 $\frac{1}{w}$ = 0.07 <i>C</i> = 37° 58' 7".71
	<i>h</i> 7° 92'	<i>h</i> 6° 74'	<i>h</i> 7° 92'	<i>h</i> 8° 68'	<i>h</i> 6° 56'	<i>h</i> 8° 16'	<i>l</i> 6° 68'	<i>l</i> 8° 34'	<i>l</i> 6° 06'	<i>l</i> 8° 36'	
	8° 09	7° 49	8° 26	8° 88	6° 92	7° 63	7° 04	8° 35	6° 25	8° 14	
<i>At (XXIII)</i>											
<i>February 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XX)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	822° 26'	142° 26'	329° 37'	149° 37'	336° 49'	156° 49'	344° 1'	164° 1'	351° 13'	171° 13'	
(XX) & (XXI)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 57".76 <i>w</i> = 16.10 $\frac{1}{w}$ = 0.06 <i>C</i> = 37° 34' 57".76
	<i>l</i> 57° 82'	<i>l</i> 59° 22'	<i>l</i> 58° 36'	<i>l</i> 58° 30'	<i>h</i> 56° 76'	<i>h</i> 58° 54'	<i>h</i> 57° 94'	<i>h</i> 56° 94'	<i>h</i> 59° 26'	<i>h</i> 56° 06'	
	<i>l</i> 57° 16'	<i>l</i> 57° 98'	<i>l</i> 57° 94'	<i>l</i> 57° 74'	<i>h</i> 58° 16'	<i>h</i> 57° 50'	<i>h</i> 56° 90'	<i>h</i> 57° 58'	<i>h</i> 58° 42'	<i>h</i> 56° 68'	
	57° 49	58° 60	58° 15	58° 02	57° 46	58° 02	57° 42	57° 26	58° 84	56° 37	
(XXI) & (XXV)	<i>h</i> 14° 36'	<i>h</i> 14° 80'	<i>h</i> 15° 52'	<i>h</i> 15° 30'	<i>l</i> 15° 92'	<i>l</i> 16° 70'	<i>l</i> 18° 22'	<i>l</i> 15° 64'	<i>h</i> 15° 48'	<i>h</i> 16° 00'	<i>M</i> = 15".41 <i>w</i> = 9.30 $\frac{1}{w}$ = 0.11 <i>C</i> = 63° 50' 15".42
	<i>h</i> 13° 88'	<i>h</i> 12° 66'	<i>h</i> 15° 90'	<i>h</i> 14° 60'	<i>l</i> 14° 68'	<i>l</i> 14° 08'	<i>l</i> 15° 56'	<i>l</i> 16° 06'	<i>h</i> 15° 34'	<i>h</i> 16° 12'	
	<i>h</i> 14° 16'					<i>l</i> 17° 64'	<i>l</i> 16° 20'				
	14° 12	13° 87	15° 71	14° 95	15° 30	16° 14	16° 66	15° 85	15° 41	16° 06	

<i>At (XXIV)</i>												
<i>April 1853, observed by Captain A. Strange with Troughton and Simm's 36-inch Theodolite.</i>												
Angle between	Circle readings, telescope being set on (XXV)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	0°1'	180°1'	7°11'	187°11'	14°24'	194°24'	21°36'	201°36'	28°48'	208°48'		
(XXV) & (XXI)	"	"	"	"	"	"	"	"	"	"		<i>M</i> = 6".31 <i>w</i> = 9.26 $\frac{1}{w}$ = 0.11 <i>C</i> = 54° 29' 6".31
	<i>h</i> 6.76	<i>h</i> 6.60	<i>h</i> 6.40	<i>h</i> 6.68	<i>h</i> 6.46	<i>h</i> 7.48	<i>h</i> 7.04	<i>l</i> 4.26	<i>l</i> 7.30	<i>l</i> 5.88		
	<i>h</i> 7.36	<i>h</i> 4.82	<i>h</i> 5.26	<i>h</i> 4.96	<i>h</i> 6.34	<i>h</i> 8.52	<i>h</i> 7.94	<i>l</i> 5.46	<i>l</i> 5.14	<i>l</i> 5.82	<i>l</i> 5.90	
	7.06	5.71	5.83	5.82	6.40	8.00	7.49	4.86	6.11	5.85		
(XXI) & (XXII)	<i>h</i> 54.40	<i>h</i> 53.52	<i>h</i> 55.10	<i>h</i> 53.26	<i>h</i> 55.62	<i>h</i> 53.50	<i>h</i> 54.40	<i>l</i> 55.76	<i>l</i> 55.86	<i>l</i> 55.36		<i>M</i> = 54".57 <i>w</i> = 9.60 $\frac{1}{w}$ = 0.10 <i>C</i> = 44° 44' 54".57
	<i>h</i> 52.90	<i>h</i> 54.64	<i>h</i> 55.04	<i>h</i> 54.08	<i>h</i> 55.06	<i>h</i> 53.22	<i>h</i> 53.38	<i>l</i> 54.54	<i>l</i> 56.74	<i>l</i> 55.00		
	53.65	54.08	55.07	53.67	55.34	53.36	53.89	55.15	56.30	55.18		
<i>At (XXV)</i>												
<i>April 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>												
Angle between	Circle readings, telescope being set on (XXIII)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	121°19'	301°19'	128°31'	308°30'	135°42'	315°42'	142°53'	322°53'	150°6'	330°6'		
(XXIII) & (XXI)	"	"	"	"	"	"	"	"	"	"		<i>M</i> = 25".15 <i>w</i> = 10.20 $\frac{1}{w}$ = 0.10 <i>C</i> = 36° 20' 25".14
	<i>h</i> 26.22	<i>h</i> 22.00	<i>l</i> 25.16	<i>l</i> 26.06	<i>l</i> 25.64	<i>l</i> 24.66	<i>l</i> 26.64	<i>l</i> 23.90	<i>l</i> 26.88	<i>l</i> 24.04		
	<i>h</i> 25.58	<i>h</i> 25.12	<i>l</i> 25.40	<i>l</i> 25.54	<i>l</i> 25.20	<i>l</i> 24.96	<i>l</i> 25.10	<i>l</i> 23.44	<i>l</i> 25.52	<i>l</i> 24.50	<i>h</i> 25.74	
	25.90	24.29	25.28	25.80	25.42	24.81	25.87	23.67	26.20	24.27		
(XXI) & (XXIV)	<i>h</i> 14.66	<i>l</i> 16.96	<i>l</i> 17.28	<i>l</i> 15.98	<i>l</i> 17.48	<i>l</i> 16.46	<i>l</i> 17.40	<i>l</i> 18.40	<i>l</i> 17.06	<i>l</i> 18.46		<i>M</i> = 17".22 <i>w</i> = 11.80 $\frac{1}{w}$ = 0.08 <i>C</i> = 58° 56' 17".22
	<i>l</i> 16.32	<i>l</i> 17.82	<i>l</i> 16.18	<i>l</i> 17.26	<i>l</i> 17.10	<i>l</i> 18.32	<i>l</i> 17.84	<i>l</i> 18.60	<i>l</i> 18.40	<i>l</i> 16.48		
	15.49	17.39	16.73	16.62	17.29	17.39	17.62	18.50	17.73	17.47		



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*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

## S I R O N J.

| Station of Observation. | Observed Angle. | No. of Observations. | Sum of Squares of Errors of single Observations. | Number of Zeros. | Sum of Squares of Errors of single Zeros. | REMARKS. |
|-------------------------|-----------------|----------------------|--------------------------------------------------|------------------|-------------------------------------------|----------|
| (I)                     | (IV) & (III)    | 24                   | 10'70                                            | 8                | 13'84                                     |          |
| "                       | (III) & (II)    | 24                   | 5'60                                             | 8                | 4'45                                      |          |
| (II)                    | (V) & (IV)      | 24                   | 5'20                                             | 8                | 13'15                                     |          |
| "                       | (IV) & (I)      | 23                   | 4'97                                             | 8                | 17'42                                     |          |
| "                       | (I) & (VII)     | 27                   | 11'92                                            | 8                | 17'35                                     |          |
| "                       | (VII) & (III)   | 29                   | 11'56                                            | 8                | 7'79                                      |          |
| (III)                   | (V) & (II)      | 24                   | 10'17                                            | 8                | 3'94                                      |          |
| "                       | (II) & R.M.     | 25                   | 11'46                                            | 8                | 7'38                                      |          |
| "                       | R.M. & (I)      | 26                   | 6'11                                             | 8                | 7'23                                      |          |
| "                       | (I) & (IV)      | 25                   | 14'38                                            | 8                | 7'03                                      |          |
| "                       | (IV) & (VII)    | 24                   | 9'94                                             | 8                | 10'92                                     |          |
| (IV)                    | (VII) & (III)   | 22                   | 9'39                                             | 8                | 14'91                                     |          |
| "                       | (III) & (VI)    | 25                   | 12'20                                            | 8                | 9'63                                      |          |
| "                       | (VI) & (I)      | 26                   | 8'68                                             | 8                | 7'73                                      |          |
| "                       | (I) & (II)      | 26                   | 17'24                                            | 8                | 6'64                                      |          |
| "                       | (II) & (V)      | 25                   | 35'37                                            | 8                | 6'29                                      |          |
| (V)                     | (IV) & (VII)    | 25                   | 13'55                                            | 8                | 3'43                                      |          |
| "                       | (VII) & (II)    | 33                   | 31'40                                            | 8                | 1'24                                      |          |
| "                       | (II) & R.M.     | 28                   | 7'01                                             | 8                | 6'72                                      |          |
| "                       | R.M. & (III)    | 28                   | 10'70                                            | 8                | 5'42                                      |          |
| "                       | (III) & (VI)    | 26                   | 15'74                                            | 8                | 5'65                                      |          |
| (VI)                    | (V) & (IV)      | 24                   | 6'91                                             | 8                | 5'72                                      |          |
| "                       | (IV) & (VII)    | 23                   | 11'64                                            | 8                | 8'61                                      |          |
| (VII)                   | R.M. & (III)    | 31                   | 21'57                                            | 8                | 5'77                                      |          |
| "                       | (III) & (VI)    | 30                   | 27'00                                            | 8                | 3'30                                      |          |
| "                       | (VI) & (II)     | 27                   | 22'77                                            | 8                | 13'91                                     |          |
| "                       | (II) & (V)      | 25                   | 27'64                                            | 8                | 13'52                                     |          |
| "                       | (V) & (IV)      | 21                   | 10'71                                            | 8                | 15'23                                     |          |

R.M. denotes "Referring-Mark."

## BASE-LINE FIGURES.

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

## DEHRA DOON.

| Station of Observation. | Observed Angle. | No. of Observations. | Sum of Squares of Errors of single Observations. | Number of Zeros. | Sum of Squares of Errors of single Zeros. | REMARKS. |
|-------------------------|-----------------|----------------------|--------------------------------------------------|------------------|-------------------------------------------|----------|
| (VIII)                  | (XI) & (X)      | 24                   | 21'69                                            | 8                | 3'87                                      |          |
| "                       | (X) & (IX)      | 24                   | 54'27                                            | 8                | 6'76                                      |          |
| (IX)                    | (XI) & (VIII)   | 24                   | 71'11                                            | 8                | 12'14                                     |          |
| "                       | (VIII) & (X)    | 26                   | 60'79                                            | 8                | 7'99                                      |          |
| (X)                     | (IX) & (VIII)   | 24                   | 42'48                                            | 8                | 6'17                                      |          |
| "                       | (VIII) & (XI)   | 24                   | 24'93                                            | 8                | 3'25                                      |          |
| (XI)                    | (X) & (VIII)    | 26                   | 30'32                                            | 8                | 9'11                                      |          |
| "                       | (VIII) & (IX)   | 25                   | 35'42                                            | 8                | 5'31                                      |          |
| CHACH                   |                 |                      |                                                  |                  |                                           |          |
| (XIII)                  | (XIV) & (XV)    | 21                   | 21'13                                            | 10               | 16'75                                     |          |
| "                       | (XV) & (XVII)   | 20                   | 14'10                                            | 10               | 8'93                                      |          |
| (XIV)                   | (XVI) & (XV)    | 21                   | 9'52                                             | 10               | 23'47                                     |          |
| "                       | (XV) & (XIII)   | 20                   | 6'20                                             | 10               | 24'75                                     |          |
| (XV)                    | (XVI) & (XVIII) | 22                   | 13'04                                            | 10               | 11'44                                     |          |
| "                       | (XVIII) & (XIX) | 21                   | 4'94                                             | 10               | 12'95                                     |          |
| "                       | (XIX) & (XVII)  | 21                   | 4'35                                             | 10               | 11'90                                     |          |
| "                       | (XVII) & (XIII) | 22                   | 10'62                                            | 10               | 13'69                                     |          |
| "                       | (XIII) & (XIV)  | 21                   | 13'67                                            | 10               | 7'44                                      |          |
| "                       | (XIV) & (XVI)   | 23                   | 21'61                                            | 10               | 20'93                                     |          |
| (XVI)                   | (XVIII) & (XV)  | 21                   | 12'93                                            | 10               | 12'21                                     |          |
| "                       | (XV) & (XIV)    | 20                   | 3'64                                             | 10               | 19'94                                     |          |
| (XVII)                  | (XIII) & (XV)   | 21                   | 14'93                                            | 10               | 19'92                                     |          |
| "                       | (XV) & (XIX)    | 21                   | 7'37                                             | 10               | 13'46                                     |          |
| (XVIII)                 | (XIX) & (XV)    | 20                   | 2'32                                             | 10               | 7'73                                      |          |
| "                       | (XV) & (XVI)    | 21                   | 24'20                                            | 10               | 1'72                                      |          |
| (XIX)                   | (XVII) & (XV)   | 21                   | 18'28                                            | 10               | 10'75                                     |          |
| "                       | (XV) & (XVIII)  | 21                   | 12'57                                            | 10               | 3'42                                      |          |



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

## KARACHI

| Station of Observation. | Observed Angle. | No. of Observations. | Sum of Squares of Errors of single Observations. | Number of Zeros. | Sum of Squares of Errors of single Zeros. | REMARKS. |
|-------------------------|-----------------|----------------------|--------------------------------------------------|------------------|-------------------------------------------|----------|
| (XX)                    | (XXII) & R.M.   | 20                   | 2'18                                             | 10               | 4'12                                      |          |
| "                       | R.M. & (XXI)    | 20                   | 1'26                                             | 10               | 1'59                                      |          |
| "                       | (XXI) & (XXIII) | 20                   | 2'50                                             | 10               | 1'96                                      |          |
| (XXI)                   | (XX) & (XXII)   | 22                   | 14'44                                            | 10               | 13'50                                     |          |
| "                       | (XXII) & (XXIV) | 24                   | 25'85                                            | 10               | 15'64                                     |          |
| "                       | (XXIV) & (XXV)  | 24                   | 29'62                                            | 10               | 7'92                                      |          |
| "                       | (XXV) & (XXIII) | 21                   | 5'92                                             | 10               | 10'94                                     |          |
| "                       | (XXIII) & (XX)  | 22                   | 14'01                                            | 10               | 11'54                                     |          |
| (XXII)                  | (XXIV) & (XXI)  | 20                   | 3'02                                             | 10               | 7'51                                      |          |
| "                       | (XXI) & (XX)    | 20                   | 2'76                                             | 10               | 5'66                                      |          |
| (XXIII)                 | (XX) & (XXI)    | 20                   | 4'04                                             | 10               | 4'63                                      |          |
| "                       | (XXI) & (XXV)   | 23                   | 14'33                                            | 10               | 7'04                                      |          |
| (XXIV)                  | (XXV) & (XXI)   | 21                   | 7'94                                             | 10               | 8'00                                      |          |
| "                       | (XXI) & (XXII)  | 20                   | 3'98                                             | 10               | 8'36                                      |          |
| (XXV)                   | (XXIII) & (XXI) | 21                   | 10'83                                            | 10               | 6'51                                      |          |
| "                       | (XXI) & (XXIV)  | 20                   | 7'94                                             | 10               | 5'77                                      |          |

From the preceding data of the sums of the squares of the apparent errors, in the measurement of each of the angles of the base-line figures at Sironj, Dehra Doon, Chach and Karáchi, we may ascertain the *e. m. s.* (error of mean square) of *observation* of a single measure of an angle, and the *e. m. s. of graduation and observation* of the mean of the measures on a single zero, for each group of angles measured with the same instrument.

The observations may be divided into three groups, as follows :—

I. The whole of the angles of the Sironj and the Dehra Doon figures; they were measured with Barrow's 36-inch theodolite, probably by Colonel Everest, though this is not quite certain; the azimuthal circle of the instrument was read by 5 microscopes, on 4 pairs of zeros (*face right* and *face left*) giving circle readings at 9° apart.

II. The angles of the Chach figure; they were measured by Mr. George Logan with Col. Waugh's 24-inch theodolite No. 1; the azimuthal circle was read by 5 microscopes, on 5 pairs of zeros, giving circle readings at 7° 12' apart.

III. The angles of the Karáchi figure; they were measured by Captain Strange with Troughton and Simms' 36-inch theodolite; the azimuthal circle was read by 5 microscopes on 5 pairs of zeros, giving circle readings at 7° 12' apart.

The whole of the stations were situated on hills with the exception of those at the extremities of the base-lines.

$$\text{The } e. m. s. \text{ of observation of a single measure} \left. \vphantom{\text{The } e. m. s. \text{ of observation of a single measure}} \right\} = \sqrt{\frac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$$

$$\text{The } e. m. s. \text{ of graduation and observation of the mean of the measures on a single zero} \left. \vphantom{\text{The } e. m. s. \text{ of graduation and observation of the mean of the measures on a single zero}} \right\} = \sqrt{\frac{\text{Sum of squares of apparent errors of zero.}}{\text{No. of angles} \times (\text{No. of changes of zero} - 1).}}$$

*The following results have been derived from these formulæ.*

| Group. | Instrument and Observer.                            | Position of stations. | Intervals between microscope readings of circle. | Number of                        |         |                  |               | <i>e. m. s.</i> of observation of a single measure.                       | <i>e. m. s.</i> of graduation and observation of a single zero.          |
|--------|-----------------------------------------------------|-----------------------|--------------------------------------------------|----------------------------------|---------|------------------|---------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------|
|        |                                                     |                       |                                                  | Measures on each zero (average). | Angles. | Single measures. | Single zeros. |                                                                           |                                                                          |
| I      | { Barrow's 36-inch.<br>Uncertain.                   | Mostly on hills.      | 9°                                               | 3.18                             | 36      | 917              | 288           | $\left\{ \frac{732.54}{917-288} \right\}^{\frac{1}{2}} = \pm 1''\cdot079$ | $\left\{ \frac{298.82}{288-36} \right\}^{\frac{1}{2}} = \pm 1''\cdot089$ |
| II     | { Col. Waugh's<br>24-inch No. 1.<br>Mr. Logan.      |                       | 7° 12'                                           | 2.10                             | 18      | 378              | 180           | $\left\{ \frac{215.42}{378-180} \right\}^{\frac{1}{2}} = \pm 1''\cdot043$ | $\left\{ \frac{241.40}{180-18} \right\}^{\frac{1}{2}} = \pm 1''\cdot221$ |
| III    | { Troughton and<br>Simms' 36-inch.<br>Cap. Strange. |                       | 7° 12'                                           | 2.11                             | 16      | 338              | 160           | $\left\{ \frac{150.62}{338-160} \right\}^{\frac{1}{2}} = \pm 1''\cdot920$ | $\left\{ \frac{120.69}{160-16} \right\}^{\frac{1}{2}} = \pm 1''\cdot915$ |

**KARACHI LONGITUDINAL SERIES.**



## KARACHI LONGITUDINAL SERIES

### INTRODUCTION

In 1848, on the completion of the Maluncha Meridional Series, the establishment employed thereon was transferred to the Karáchi Longitudinal Series, which was to be carried westward from Sironj, in latitude  $24^{\circ}$  N., to Karáchi, in Sind, where it was designed to measure a base-line, the locality being admirably adapted for such an object, as it would serve two purposes at the same time, *viz.*, a foundation for the triangulation of Sind on the one hand, and on the other a verification of the contemplated operations forming the connecting link with the Great Arc, which is the main axis of all Indian geography.

The objects of this triangulation were, *1st*, to connect the survey of the Province of Sind, *2nd*, to verify the triangulation of the Bombay surveys, *3rd*, to furnish a basis for the subordinate meridional triangulation over the country to the west of the Great Arc.

This important undertaking was placed under the superintendence of Captain T. Renny, (afterwards, Renny Tailyour) of the Bengal Engineers, with instructions to make the series double throughout, by forming a succession of quadrilateral or polygonal figures, or a combination of both, by which means, not only is a superior degree of accuracy attained, but the work can be verified at every stage during its progress.

The geographical knowledge of the countries to be traversed by this series, being very limited, Captain Renny was directed by the Surveyor General, Lieutenant Colonel Waugh, to obtain, in addition to the principal triangulation, as much topographical knowledge as possible, as well by regular secondary operations, as by route surveys and by sketching the features of the country, and especially, that every important city, town, or cantonment, within a moderate distance of the principal triangulation, should be connected.

Captain A. Strange, who had been appointed a 2nd Assistant in the Department, in

Season 1848-49.

#### PERSONNEL.

Captain T. Renny, Bengal Engineers, 1st Assistant.  
 " A. Strange, Madras Cavalry, 2nd  
 Mr. C. Lane, 3rd Principal Sub-Assistant. "  
 " W. C. Roessenrode, Junior 1st Class Sub-Assst.  
 " A. T. Haycock, 3rd Class Sub-Assistant.  
 " E. W. Pierce, Do.

December 1847, and was originally selected on account of his qualifications as an astronomical observer, and a skilful mechanic, was posted to the party, with a view to his acquiring a practical knowledge of geodetical operations. Captain Renny left Head Quarters on the 3rd October 1848, accompanied by Mr. Pierce, and

arrived in the neighbourhood of Sironj on 22nd November, having been joined *en-route* at Agra,

by Captain Strange, and Messrs. Lane and Haycock. Mr. Rossenrode had been previously detached in advance to explore the ground.

The country where the operations commenced is thus described by Captain Renny :—  
 “The country immediately west of the valley of Sironj, is very unfavorable for geodetic operations, being a high table-land, presenting a succession of flat ridges of nearly equal height, covered with a mixture of jungle, and villages which are surrounded by topes of trees, so that the view was generally very contracted, and the selection of stations a matter of much difficulty.”

After various trials however, Captain Renny succeeded in forming two polygons emanating from the stations Kámkherá and Súrantál, of the Great Arc, which points are most eligibly situated for the origin of so extensive a work, being immediately connected with the Sironj Base. Previous to commencing the observations, Captains Renny and Strange, examined the state of the centre marks of these stations, as the accuracy of all the subsequent operations depended on their identity. That at Súrantál, which was fixed in an isolated masonry pillar, was found intact, but at Kámkherá, where the pillar had been constructed of only stone and mud, the upper mark-stone had been removed. On digging down, however, they found that the mark-stone at the bottom of the pillar was quite safe.

By the beginning of January 1849, the stations were ready for the observations to be commenced. The progress in the observations however, during that month was small, owing to defects in the Instrument, (Troughton and Simms' 36-inch Theodolite) which could only be detected from the discrepancies they occasioned in the observations, and which had to be remedied after a careful investigation of their causes. The necessary alterations were ably executed by Captain Strange, whose mechanical genius proved of great service. The time lost by these alterations, and in the consequent revision of work, caused great delay in the observations of angles at the two stations first visited, so that Captain Renny did not arrive at his third station, Súrantál, until nearly the middle of February. Subsequently, the observations were continued till the second week in May, when the atmosphere became so decidedly unfavorable, that no further work could be obtained. Captain Strange and Mr. Lane, assisted in the principal observations. Mr. Rossenrode was employed in selecting stations, and constructing platforms, and Messrs. Haycock and Pierce acted as observatory recorders, and assisted in the current office duties.

Lieutenant H. Rivers, Bombay Engineers, in charge of the Bombay Party, had been employed on the Khánpisúra Meridional Series. At the end of 1848, however, his instrument having got completely out of order, the operations had to be suspended.

PERSONNEL.  
 Lieut. H. Rivers, Bombay Engineers, 1st Assistant.  
 Mr. J. Fraser, Senior 1st class Sub-Assistant.  
 „ T. Sanger, Junior 1st class Sub-Assistant.  
 „ T. DaCosta, Do.

Lieutenant Rivers had been appointed to the Survey for special work in the Bombay Presidency, and had had no preliminary training in the Department. As there was little choice in the mode of employing the Bombay Party, Lieutenant Colonel Waugh availed himself of the opportunity afforded by Captain Renny's services lying in the vicinity of Lieutenant Rivers', to direct the latter to employ the remaining part of the season 1848-49 in assisting on the

**Karachi Longitudinal Series.** He was thus afforded an opportunity of acquiring a knowledge of the Great Theodolite, and of the forms and usages of the G. T. Survey Department, prevailing in Bengal. He joined the Karachi Longitudinal Series, with the Bombay party, on the 5th March, and contributed to the progress of these operations by his own labors, and that of his establishment.

The amount of work executed jointly by the two parties during the field season, was as follows; observations were completed at 13 principal stations; circumpolar star observations for Azimuth were taken at 3 stations; the approximate series was carried 220 miles, along the parallel of latitude of Kaliánpúr, to which the southern flank of the series conforms; a branch series of minor triangles, extending about 60 miles in length, was carried to fix the positions of Sehore, Narsinghar, Bhopal &c., as well as to furnish points for a topographical survey, then in progress in those districts, under the orders of the Resident of Sehore; the topographical details of the country embracing the first two polygons were filled in, comprising an area of about 2,300 square miles.

At the conclusion of the field season, Captain Renny with his party, marched to Neemuch, where they cantoned during the monsoon. Lieutenant Rivers, with the Bombay Party, recessed at Mhow. At the close of the rainy season, Captain Renny's services being required at Head Quarters, he received orders to make over charge of the Series to Captain Strange, and to proceed to Dehra. Mr. Haycock was transferred at the same time to assist Captain Renny. Captain Strange assumed charge on the 6th September 1849.

On account of the unhealthy state of the country, in the neighbourhood of Neemuch,

Season 1849-50.

PERSONNEL.

Capt. A. Strange, Madras Cavalry, 2nd Assistant.  
Mr. C. Lane, 3rd Principal Sub-Assistant.  
" W. C. Rossenrode, Jr. 1st class Sub-Asst.  
" R. W. Pierce, 3rd class Sub-Assistant.

after the breaking up of the rains, Captain Strange, by the advice of the political officers of the districts, delayed his departure for the field till the beginning of November. Mr. Rossenrode having been previously despatched to select stations, and build the platforms in

advance, the main party left Neemuch on 3rd November and proceeded to Rámpura station, to continue the principal observations. Notwithstanding some delay from the unfavorable state of the atmosphere in January, Captain Strange had completed observations at 18 principal stations, and taken 4 sets of circumpolar star observations for Azimuth, by the beginning of March 1850. The weather then became so unpropitious, that after waiting 6 days at one station without seeing any signals, Captain Strange resolved to discontinue field work for the season. Mr. Lane assisted Captain Strange in the observatory, and fixed the positions of the cantonments of Augur, and Neemuch. Mr. Rossenrode continued in the field till the 10th April, by which time he had advanced the approximate series to about 30 miles west of Mount Aboo, over a direct distance of about 150 miles, through a very difficult piece of country.

The general character of the country through which the series had advanced, and which lies chiefly in the native states subject to Sironj, Gwalior, and Holkar, is thus described by Captain Strange :—

“The first polygon of the present season’s operations, has its stations in several districts, *viz.*, Kilchipúr, Kúmraj, Narsinghar, Kotah, Tonk &c. This part of the country is even bolder than that met with in the previous season; most of the stations being fixed upon high isolated hills, command in several instances a view of upwards of 40 miles. Of the 3 quadrilaterals next in order, the northern stations are fixed upon one continuous plateau of considerable height in many parts, and stretching away far to the north. The southern stations stand upon isolated hills, which here constitute the prevailing feature. The tract between the southern and northern stations is low, cultivated land, diversified with detached conical hills. The station of Dhamnár is within a few feet of the caves of that name, which are objects of great celebrity, and offer much to interest both the antiquarian and the artist. The series here enters the Neemuch district, (under British superintendence) which closely borders the Udaipúr dominions. To the west of Neemuch, the nature of the country is more formidable, and the series enters a wild, uncivilized land, whose deep and rugged valleys and dense jungles, afford refuge to bands of plunderers of the Bhíl and Mina tribes. Villages are here thinly scattered, cultivation meagre, and provisions consequently dear and scarce. These characteristics become aggravated as the series advances over the Araballi range of mountains, to cross which, even by the high road, is a work of difficulty. Nothing but systematic pioneering will enable the party to advance from station to station, for the unfrequented mountain passes, contracted by rocks, and overhung with dense jungle, afford in their usual condition, passage only for a single man.”

Lieut.-Colonel Waugh highly commended Captain Strange for his successful field season’s operations, and recommended him for promotion to the grade of 1st Assistant, which was sanctioned from 1st May 1850.

Captain Strange had been directed on the close of the field season, to recess with his party at Mount Aboo, that station being conveniently situated for the further prosecution of the triangulation, and more particularly, for its extension across the desert. He commenced his march thereto, on the 10th March, the route lying through the city of Udaipúr, where he waited upon his highness the Rana of Udaipúr, from whom he received every assurance of assistance whilst employed in his dominions. When at Udaipúr, a representation was made to Captain Strange, by the minister of the Rana, offering objections to the construction of a platform, which had been built by Mr. Rossenrode for a principal station of the series, on a high hill in the vicinity of Bharak, on the grounds of its interfering with the religious prejudices of the inhabitants, who resort to a temple situated in that locality, reputed to be of great sanctity; it was stated that this platform had excited great displeasure in the divinities, to whom the temple was dedicated, evinced by the miraculous flow of milk and water therefrom, and that nothing short of the total demolition of the obnoxious structure, could allay the wrath of the Deities, and the apprehensions of their worshippers. It appeared however, that the sanctity of the temple itself had not been violated, but that there had formerly existed some objects of reverence, the sublime nature of which could not be distinctly ascertained, which it was declared had been removed, to give place to the profane platform.



On investigation this proved fallacious, as Mr. Rossenrode had made strict inquiries of the inhabitants as to the propriety of building the station at Bháarak, and they not only gave him full permission to do so, but also pressed him to accept the building materials free of all charge. As the removal of the platform and the alteration of the station would have entailed great delay and additional expense, the political officer was appealed to, to exert his influence in the matter, especially as the question was one of more extensive bearing than this solitary case implied. On this subject Captain Strange wrote as follows:—"My operations are at present traversing a tract of country, the religious prejudices of whose inhabitants are more uncompromising than common, and almost every high point in this hilly land is associated in their minds with devotional customs and traditions. The Trigonometrical Survey has, moreover, the misfortune frequently to stand suspected, even by educated natives, of a malign influence; our luminous signals and mysteriously unintelligible instruments, conducing very much to the feelings of dread and aversion with which our supposed diabolical rites are beheld. Such being the nature of one of the many difficulties opposed to my progress, it seems that were the point at issue concerning Bháarak station to be decided in favour of this superstitious demand, the inevitable consequence would be, that similar objections would be raised to every station in this portion of the series." The political officer addressed a communication to the Rana of Udaipur on the subject, with a satisfactory result, and the station was ultimately made use of.

The approximate series had now reached the borders of the desert, and great apprehensions were felt of the physical and social difficulties to be encountered in carrying the triangulation across this arid tract, and the expense they would occasion, no analogous operations having been ever attempted. In September 1850, therefore, Mr. Rossenrode was despatched on an exploring expedition to ascertain the feasibility of carrying the series in a direct course across the desert, and to report on the nature of the peculiarities of the country that seemed to offer obstacles or difficulties to the progress of the work, and the best means of overcoming, or avoiding them.

Captain Strange, with Messrs. Lane and Burt, the latter having been posted to the

Season 1850-51.

PERSONNEL.

Captain A. Strange, Madras Cavalry, 1st Assistant.  
 Mr. C. Lane, 3rd Principal Sub-Assistant.  
 " W. C. Rossenrode, Junior 1st Class Sub-Assst.  
 " C. H. Burt, 3rd Class Sub-Assistant.  
 " James McGill, Do.

party in place of Mr. Pierce, who had resigned his appointment in the department, took the field on the 4th November and commenced operations at Gúru Sikkar station, the highest hill above Mount Aboo.

Captain Strange, assisted by Mr. Lane, carried on the principal observations till the beginning of April, when he had completed the mountain work in the Araballi range, defined by the stations of Jeráj and Súnda, and 8 more stations to the west, comprising in all, observations at 24 principal stations. The party then returned to quarters at Mount Aboo, reaching that place on 13th April 1851.

Most of the stations visited during this season, were situated in the Araballi range of mountains, to cross which considerable difficulties were met with.

Captain Strange describes the Araballi mountains as an extensive tract, having a general north and south direction, composed of ridges and peaks, which though attaining no

elevation greater perhaps than 5,500 feet above the sea, yet exhibit in their details all the boldest features of the most stupendous mountain scenery. The traveller at the end of his day's journey attains perhaps an elevation little greater than that from whence he departed; but he has in its course more than once ascended with great labour high acclivities, only to plunge again and again through dense forests, and across rugged beds of mountain torrents, into precipitous valleys of equal depth. In many parts of this very peculiar tract, where but slight communication and no traffic exists, it may be said that there are no roads whatever. Nothing meets the eye, but vast blocks of granite, towering aloft, and jungles almost impenetrable, obstruct every step. The habitations of men are seldom met with, and man himself as here found, roams a lawless savage.

In a tract so wild and destitute of roads, the transport of the Great Theodolite was naturally a matter of great anxiety and responsibility. The expedients resorted to however, proved quite successful, and although some risk was incurred, the expense of cutting roads was saved, and the mountain work completed before the want of water and the dust of the desert put a stop to further operations. By these energetic measures nearly a whole season was saved, and the principal triangulation advanced 60 miles west of Mount Aboo.

The cantonments of Deesa and Erinpúra, and the city of Sirohi, were fixed by observations from the principal stations. The city of Udaipur was connected from one principal and one secondary station. Several 1st class secondary points were determined with the Great Theodolite, and many 2nd class secondary points and villages were also fixed. The Araballi range however was found to be unfavourable for secondary operations, owing to the great difficulties and delays occasioned in setting up marks. Captain Strange reports:—"This delay was owing to several causes, such as the utter impossibility, in many instances, of obtaining the name of a distant point, or of any village near it; the worthlessness of the guides, who constantly ran away leaving the signal men in the midst of a trackless mountain waste; the great similarity of the peaks and ridges to each other when near them; to which may be added the absence of villages for many miles and the want of intelligence and willingness to assist, that characterised the inhabitants generally. In many parts also it was quite unsafe to detach parties of two or three men: each party of signal men had to be escorted by two sepoys, and to this protection they owed their safety." Owing also to the desertion of the theodolite bearers, and the diminution of the native establishment from the high pay it was necessary to give, to retain the men in such a wild and expensive country, Captain Strange's means for secondary work were restricted.

Mr. Rossenrode, by the end of October 1850, having explored the tract across the desert up to within 50 miles of Tatta, reported the practicability of carrying the series through it, and stated that considerable facilities existed for triangulation, whereby the anticipated expense would be greatly reduced and the work vastly accelerated.

While the final operations were progressing in the rear under Captain Strange, Mr. Rossenrode was laying out the approximate triangulation over the desert, and during the season selected 44 triangles, extending, in quadrilaterals and polygons, 145 miles in advance, which was nearly half way across the desert tract. He also arranged for the building of 4 towers and 32 platforms, in a country absolutely destitute of workmen, and of many of

the essential materials for building. The fruits of his labour afford ample proof of his indefatigable exertions and skill, especially as he was necessarily left to act on his discretion as circumstances prompted, having been cut off from postal communication for several months.

Mr. Burt was employed during the field season in the observatory, and occasionally in selecting and observing at secondary stations. Mr. James McGill, who was temporarily attached to the Karachi Longitudinal Series, joined on the 6th January. Shortly afterwards however he was taken ill and was obliged to proceed to Erinpúra for medical advice.

Captain Strange broke ground again on 1st November 1851, with the same assistants as during the previous season, and proceeded to the desert to continue the final observations. This tract being destitute of food such as the men of the survey were accustomed to, and the grain used by the inhabitants being barely sufficient for their own wants, it was indispensable that suitable and timely arrangements should be made for the supply of provisions. The nearest places from which they could be procured at moderate prices, were Deesa on the one extremity, and the Sind towns on the other.

Season 1850-51.

The projected measures contemplated the establishment of three depôts for grain, at the principal stations of Virária, Lúнки, and Rojhra; the first two to be supplied from Deesa, the last from Sind: each depôt to contain twenty days provisions. Estimating the whole party at 200 men, and the rate of consumption at one seer per man per diem, the supply would amount to 100 maunds, which at 5 maunds per camel, required a convoy of twenty camels; this number being able to stock the depôts in three trips. Ten camels were further required for water for the main party, five for the advanced party on the approximate series, and five for the secondary operations and detached signal men. The extraordinary aid required, amounted therefore to forty camels, which was found just sufficient for the purpose.

It was clear that success depended chiefly on traversing the desert at the best season, which being brief in duration, it was necessary that the rate of progress should be accelerated as much as possible, so as to endeavour to reach in that short time, the fertile plains of Sind, being a distance amounting to 3° of Longitude.

The line of country traversed is thus described by Captain Strange:—"The tract crossed by the series comprises three distinct kinds of ground, *viz.*, 1. The sandy, undulating country between the Araballi range and the desert; 2. The desert; 3. The plains of Sind. The character of the soil on leaving Mount Aboo and proceeding westwards, alters immediately from hard rock, to sand nearly free from loam. The country is in many parts flat, but more commonly presents gentle undulations. A few isolated hills are found west of Aboo, some of which are of considerable altitude; the station of Súnda being 3,336 feet above the sea. The last hill is the station of Bargáon, beyond which as far as the desert, there are a succession of gentle swells, clothed with rather thick, low, stunted jungle. This tract, appertaining chiefly to the Jodhpúr and Pálhanpúr states, is thinly populated and but little cultivated, the inhabitants relying for support chiefly on large herds of cattle. Water in this region is generally brackish, and wells are the only source of supply. These are generally deep, some being no less than 300 feet in depth. It is altogether a miserable country and only interesting from its physical deficiencies.

“The desert, commonly known among the natives as the “Tharr”, and geographically termed the “Little Desert”, is composed throughout of sand hills, whose general form is long straight ridges, which seldom unite, but stand at close and regular intervals, parallel to each other. The ripple marks on the sea shore afford a fair illustration, in miniature, of the formation of the ground. Some of these sand hills are perhaps a mile long, and vary from 50 to 300 feet in height, their sides are deeply channelled by rain, and their general appearance from a distance differs but little from that of ordinary low hills. They are evidently permanent. There is more jungle than might be expected in a desert, but it is low and almost leafless. The whole tract in the cold season is clothed with grass, attaining in many parts, a height of two feet. At this period, it is much resorted to for pasturage, by owners of large herds, who desert it again on the approach of the hot weather. The permanent population is of course scanty, and their villages, scattered at intervals of from 8 to 12 miles, consist of a few conical huts scarcely a man’s height, rudely constructed of twigs and grass. A herd of cattle, a few camels and a well, constitute the wealth of a village; no cultivation is attempted, except during the rains, when an uncertain crop of Millet (Bajra) is obtained. A fine race of men, inhabit this inhospitable region: athletic in frame, independent, cheerful, intelligent and brave, they only require to abstain from their favourite pursuit of cattle lifting, to rank above almost any other tribe in India. The villages in the desert, though invariably distinguished by a name, cannot be considered, strictly speaking, fixed localities, as their permanence is dependent solely on that of the well: as long as that affords sufficient water, of tolerable quality, the village remains standing. The wells of the desert are however liable to cease flowing or to become too brackish, even for the use of the inhabitants or their cattle. The spot is then deserted, and the villagers migrate to some more favoured locality. The wells seldom exceed 100 feet in depth. Water is also collected during the periodical rains, in small tanks and ponds, by damming up the streams running down from the sand hills and the intervening gullies.

“Travelling in the desert is exceedingly laborious to men carrying loads: no sooner is one sand hill passed than another presents itself. The hill sides are very steep and every frequented track is converted into deep loose sand, into which the feet sink to the ankles. No wheel carriage is used, nor are loads ever carried voluntarily by the inhabitants, otherwise than on camels, the only fit conveyance on such a soil. Indeed the men of the desert rarely walk, as every man possesses a camel. The air during the cold months is very transparent, which circumstance greatly favoured the observations. The portion of the desert traversed by the operations belongs partly to Bhúj, and partly to Hyderabad in Sind.

“The transition from the desert to the plains of Sind is surprisingly sudden. In the space of a hundred yards, the traveller leaves a sandy waste, and enters a perfectly flat country with a firm black, loamy soil, rich with luxuriant crops. Inhabitants, customs, language, and vegetation are exchanged with the same startling abruptness. The soil is devoid of grass, jungle is thick and plentiful, the country populous and cultivated, and intersected in every direction by irrigation canals, which are dry in the cold season. Such

“ a country is very unfavourable to trigonometrical operations. Ray tracing and clearing check the progress of the approximate work; the necessity of building towers causes further delay and expense, and bad signal lights embarrass the observations.”

The desert was found perfectly free from mirage at the season it was visited; but the Runn of Cutch, on the southern flank of the series, was greatly affected by this atmospheric phenomenon, which prevented the ascertainment of the height of the Runn with respect to the sea level. The physical character of this tract is a matter of much interest. The Runn or salt marsh is supposed to be the dried up bed of an inland sea, which has resulted from its elevation by an earthquake. In this case it may either be at ordinary high water level, or may form a basin below it. To determine this point, a secondary station was selected in the Runn, and vertical angles taken to it from Akoria station, on the edge of the tract, but the secondary point could not be connected, and the vertical angles were so affected by mirage, as to be untrustworthy.

Captain Strange describes the Runn to be in November superficially dry, the soil of a dark colour, totally without vegetation, and in many places so smooth, as to reflect the image of the sun like water. The soil however becomes dry to the depth of an inch or two only, and this crust being removed, a soft quagmire strongly impregnated with salt is discovered, from which abundance of vapour constantly arises. In the rains, the Runn is entirely flooded by rain and sea water combined, which on evaporating, leaves the salt which is found so abundantly covering the surface of the depressed portions.

Captain Strange, assisted by Mr. Lane, continued the principal observations without any obstructions, till the end of January 1852, when the former officer was obliged to apply for leave on urgent private affairs, and to make over charge of the party temporarily to Mr Lane. As the camp would have to cross the desert again, in returning to quarters at Mount Aboo, it was necessary to close the work by such a date, as would enable the party to accomplish the journey before the desert became impassable. Mr. Lane found sufficient time to complete the observations of one more hexagonal figure and started on 23rd February with the main camp, *en route* to Mount Aboo, where they arrived about the middle of March. Captain Strange rejoined from leave and resumed charge on the 15th March.

The progress made in the principal triangulation in the season 1851-52, consisted of observations at 39 stations, forming 53 triangles, over a direct distance of about 180 miles, and 9 complete sets of circumpolar star observations for Azimuth. The following towns situated in the desert were also laid down, *viz.*, Islamkot, Mitti, Chelar, and Umarkot. This amount of work was accomplished in the short space of 3 months and 10 days, an achievement which had not been surpassed.

During the same season, Mr. Rossenrode was engaged in extending the approximate series, which he carried successfully up to Karáchi, the terminus of the Karáchi Longitudinal Series. There he succeeded in selecting suitable ground for the proposed base of verification. In the short period of 4 months, Mr. Rossenrode had laid out 7 polygonal and 2 quadrilateral figures formed by 40 principal stations, many of which being in a flat country, were selected by the tedious method of ray tracing. He also made arrangements for building 13 towers and 8 platforms. Mr. Rossenrode was directed to quarter at Karáchi at the close of the field season,

in order to facilitate the construction of the numerous towers and platforms remaining to be built in that vicinity, and especially of those defining the extremities of the base-line.

The secondary operations were intrusted to Mr. James McGill, by whom a chain of points was selected on either flank of the series. These points are 66 in number, of which 30 are 1st class secondary stations laid down with the Great Theodolite: 37 masonry pillars were built to mark these points. Mr. McGill suffered more or less from ill health during the whole season, but continued his duties without intermission. At the end of the field season however, he became so seriously ill from the continued effects of the malady he was suffering from, that he was incapacitated from doing any work for some months. Mr. Burt was employed as usual in recording observations and in the current duties of the office.

Lieutenant J. F. Tennant, of the Bengal Engineers, had been appointed to the Department as a 2nd Assistant in October 1851, and was shortly afterwards posted to the Karáchi Longitudinal Series. He was unable however, to join the party in time to participate in the field operations of 1851-52, and was directed therefore to proceed to Mount Aboo, where he joined Captain Strange in March 1852.

Captain Strange took the field again on 15th November. Even at that late date considerable sickness was found to prevail in the villages, and a large proportion of the native

Season 1852-53.

PERSONNEL.

Capt. A. Strange, Madras Cavalry, 1st Assistant.  
Lieut. J. F. Tennant, Engineers, 2nd do.  
Mr. C. Lane, 3rd Principal Sub-Assistant.  
" C. H. Burt, 3rd Class do.

establishment became prostrated with fever which proved fatal in four cases. Mr. Rossenrode, having completed the preliminary operations of this series, was directed to lay out the approximate triangulation of the Indus Series, on which duty he was employed all the season.

Mr. McGill was transferred to the Ráwal Pindi survey under Lieutenant Robinson, of the Bengal Engineers.

The party reached their ground of operations on 8th December, when Captain Strange, assisted by Lieutenant Tennant, commenced the principal observations, which progressed smoothly until the station of Chútli was reached. Here a wearisome detention of 25 days took place from the unfavourable state of the atmosphere. At the next station, Kanád, the observing party was doomed to meet fresh misfortunes arising from the tower giving way. After many anxieties, the party at length reached its goal, Magar Pír hill station, where, on the evening of 22nd April 1853, the last angle necessary to complete the principal triangulation of the Karáchi Longitudinal Series was measured, and the work brought to a successful close.

The season's operations crossed two kinds of country which Captain Strange describes as follows:—"The first portion from the desert to the Indus is a flat alluvial tract, populous and extensively cultivated, the waste land being covered with thick Tamarisk and Mimosa jungles. The whole is intersected in every direction by a net work of irrigating canals which are supplied by the inundations of the Indus. On crossing the Indus, the series enters a hilly tract of marine sedimentary formation. This is more strictly a desert than the country so called, through which the series passed during the previous season. It has a scantier vegetation, fewer inhabitants, no fixed villages, less water though of a superior description, and is throughout stony and arid. This tract extends westwards beyond

“ Karáchi. It ceases abruptly to the south, the series conforming to its boundary nearly  
“ and it stretches away to the north for a considerable distance. The hills included by the  
“ series, vary from 1,500 feet downwards, but to the north and west they attain a much  
“ greater elevation : they have all with scarcely an exception, a precipitous face on the eastern  
“ side, the western sloping in a gradual incline. The whole of this extensive tract may be  
“ considered one bed of fossils, whole hills being composed entirely of marine exuvieæ. There  
“ are in many parts extensive superficial beds of iron which are apparently very rich.”

The secondary operations this year were conducted by Mr. Lane, who was unfortunately taken ill the day after the camp left quarters, and was under medical treatment at Erinpúra for more than a month. He rejoined the party on 1st January and connected the following important places and towns with a 14-inch theodolite, *viz.*, the cantonment of Hyderabad, the towns of Kotri and Jherak, and the sea port of Soumiani, a small town in Belúchistan, together with a few points on the coast to determine its general form. The towns of Tatta and Mahomed Khan's Tanda, and numerous points in the cantonment of Karáchi and its vicinity, including the Manora Light House, were also fixed from the principal triangulation.

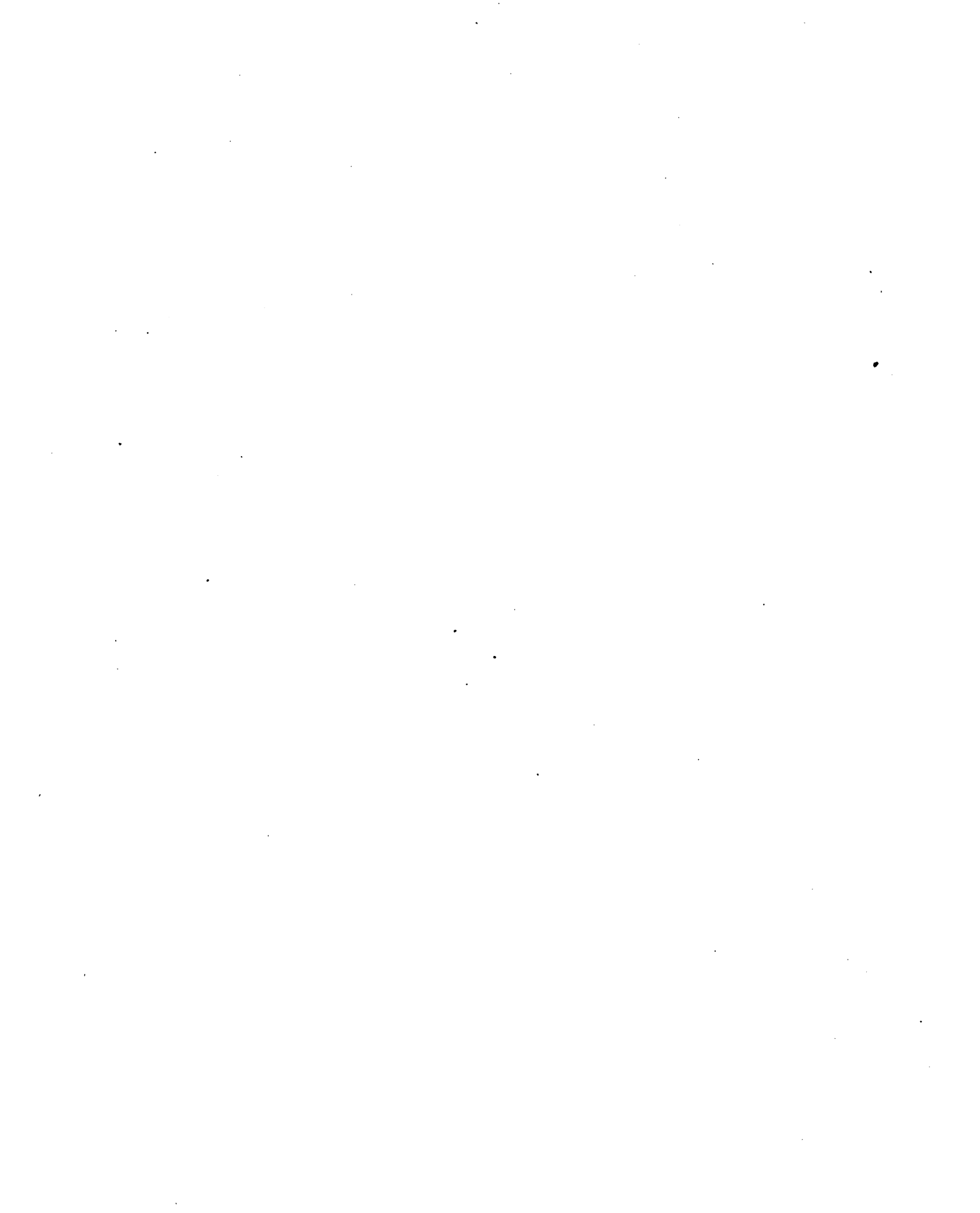
The series was thus executed in five years. The extent of the arc of Longitude is  $10^{\circ} 37'$ , equivalent to 672 miles in length, covering an area of 23,099 square miles ; and being continuous with the Calcutta Longitudinal Series, it forms therewith the largest Longitudinal arc, ever measured on the surface of the globe, stretching over the whole breadth of the Peninsula of India, from Calcutta on the east, to Karáchi on the west.

The remarkable energy and rapidity with which the series was carried on, under many and great difficulties, reflects the highest credit on Captain Strange and his assistants. Captain Strange in reporting the conclusion of the operations, brings prominently to notice the valuable aid he derived throughout from Mr. Rossenrode, to whose exertion and skill in laying out the approximate series, the success of the undertaking was mainly owing.

The Karáchi base-line was measured in the season 1854-55, and on the completion of the calculations thereof, it was found that the measured length of the base-line was greater than that of the trigonometrical length, expressed in terms of the Sironj base-line, by 10.45 inches : in other words, the ratio of the total error which had been generated in the course of the triangulation was  $= 23 \mu$ ,  $\mu$  being the millionth part of the distance. This error is taken from the then existing records of the department, in which the triangulation was reduced according to a method of successive approximations introduced by Colonel Everest.

July 17th, 1873.

H. R. THUILLIER.





## ALPHABETICAL LIST OF STATIONS.



|                         |          |                            |          |
|-------------------------|----------|----------------------------|----------|
| Adúri . . . . .         | XC.      | Gangasára . . . . .        | LXV.     |
| Agar . . . . .          | II.      | Ghatána . . . . .          | CV.      |
| Akoria . . . . .        | LXI.     | Gopálpúra . . . . .        | XXV.     |
| Alamkhán . . . . .      | XCV.     | Gulásan . . . . .          | LIII.    |
| Alam-Shahar . . . . .   | LXVIII.  | Gurária . . . . .          | XVI.     |
| Amírsha . . . . .       | LXXXVI.  | Gúrú Sikkar . . . . .      | XLII.    |
| Aramlia . . . . .       | XXIII.   | Hakimáni . . . . .         | XCVI.    |
| Arniála . . . . .       | LXXIV.   | Hatní . . . . .            | VII.     |
| Atithol . . . . .       | XLIX.    | Hilaia . . . . .           | CH.      |
| Bálagarra . . . . .     | XXIV.    | Honitáli . . . . .         | LIX.     |
| Bánskati . . . . .      | XIV.     | Ján Mahamad . . . . .      | LXXXIX.  |
| Bargáon . . . . .       | XLV.     | Jeráj . . . . .            | XLIII.   |
| Barra Sádri . . . . .   | XXVII.   | Jhund . . . . .            | LXVI.    |
| Belka . . . . .         | XXXIX.   | Takeja . . . . .           | XCVIII.  |
| Bharak . . . . .        | XXXI.    | Kámkherá . . . . .         | (IV).    |
| Bhilgáon . . . . .      | LXIV.    | (of base-line figures).    |          |
| Birona . . . . .        | XLVI.    | Kanád . . . . .            | CI.      |
| Bolálio . . . . .       | (XXV).   | Kánagar . . . . .          | XXXVIII. |
| (of base-line figures). |          | Kára . . . . .             | CVI.     |
| Bol . . . . .           | (XXIII). | Káribhit . . . . .         | LXIX.    |
| (of base-line figures). |          | Károthol . . . . .         | CIV.     |
| Bonik . . . . .         | XLI.     | Kát-báman . . . . .        | XCVII.   |
| Borikalor . . . . .     | XXX.     | Khajúri . . . . .          | XVII.    |
| Búda . . . . .          | XXI.     | Khankharia . . . . .       | LI.      |
| Búgia . . . . .         | LXXXI.   | Khori . . . . .            | XCI.     |
| Chánga . . . . .        | LXXX.    | Kúsalpúra . . . . .        | XIII.    |
| Chútli . . . . .        | C.       | Kíl . . . . .              | LXXIX.   |
| Dadúri . . . . .        | CIII.    | Kosia . . . . .            | LII.     |
| Dand . . . . .          | VI.      | Kúni . . . . .             | CVIII.   |
| Dang-ka-basti . . . . . | XCH.     | Lakarwas . . . . .         | XXXII.   |
| Dáwa . . . . .          | X.       | Losalli . . . . .          | I.       |
| Dáwal . . . . .         | LV.      | Lúnki . . . . .            | LXXI.    |
| Dhamnár . . . . .       | XIX.     | Magar Pir . . . . .        | (XXII).  |
| Dhárindera . . . . .    | LXXIII.  | Maio . . . . .             | (XXIV).  |
| Dhingpúra . . . . .     | LVIII.   | Mairáb-ká-Shahar . . . . . | LXXXV.   |
| Didáwa . . . . .        | LXII.    | Mál Niver . . . . .        | XXXVI.   |
| Drábi . . . . .         | LXXVII.  | Manjákar . . . . .         | LXXXIV.  |
| Farráha . . . . .       | LXXXVII. | Márd . . . . .             | XL.      |
| Fulrár . . . . .        | LXXVI.   |                            |          |

## ALPHABETICAL LIST OF STATIONS—(Continued.)

|                        |           |                         |          |
|------------------------|-----------|-------------------------|----------|
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| Mátá-ká-húra . . . . . | IX.       | Sarla . . . . .         | LVII.    |
| Mendki . . . . .       | XXVI.     | Sartal . . . . .        | XI.      |
| Nága Sha . . . . .     | XCIX.     | Sáwaji . . . . .        | CIX.     |
| Nándna . . . . .       | VIII.     | Shá Turel . . . . .     | XCIII.   |
| Nanka Húáro . . . . .  | XXII.     | Sitora . . . . .        | XLVIII.  |
| Nidamáni . . . . .     | XCIV.     | Sodáchar . . . . .      | LXXXIII. |
| Nimthúr . . . . .      | XVIII.    | Sohági . . . . .        | LXIII.   |
| Pádria . . . . .       | LXXXII.   | Súnda . . . . .         | XLIV.    |
| Pakka Kothi . . . . .  | LXXII.    | Súrantál . . . . .      | (III).   |
| Pancháwa . . . . .     | XV.       | (of base-line figures). |          |
| Pangra . . . . .       | LXXXVIII. | Támpi . . . . .         | LX.      |
| Rajúra . . . . .       | LVI.      | Tána . . . . .          | XXIX.    |
| Rámpúra . . . . .      | XX.       | Thalli . . . . .        | L.       |
| Rámpúr . . . . .       | IV.       | Tiki . . . . .          | XXXIII.  |
| Rangáon . . . . .      | XII.      | Tinsía . . . . .        | III.     |
| Rojhra . . . . .       | LXXV.     | Ter . . . . .           | XXXIV.   |
| Sáhiji . . . . .       | CVII.     | Tugúsar . . . . .       | LXX.     |
| Salot . . . . .        | V.        | Virária . . . . .       | LXVII.   |
| Samáro . . . . .       | XLVII.    | Waladhar . . . . .      | LIV.     |
| Sánd . . . . .         | XXVIII.   | Zelio . . . . .         | XXXVII.  |

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## NUMERICAL LIST OF STATIONS.



|        |   |   |   |                         |         |   |   |   |              |
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|        | . | . | . | (of base-line figures). | XXXVI   | . | . | . | Mál Niver.   |
| (IV)   | . | . | . | Kámkherá.               | XXXVII  | . | . | . | Zelio.       |
|        | . | . | . | (of base-line figures). | XXXVIII | . | . | . | Kánnagar.    |
| I      | . | . | . | Losalli.                | XXXIX   | . | . | . | Belka.       |
| II     | . | . | . | Agar.                   | XL      | . | . | . | Márd.        |
| III    | . | . | . | Tinsiá.                 | XLI     | . | . | . | Bonik.       |
| IV     | . | . | . | Rámpúr.                 | XLII    | . | . | . | Gúrú Sikkar. |
| V      | . | . | . | Salot.                  | XLIII   | . | . | . | Jeráj.       |
| VI     | . | . | . | Dand.                   | XLIV    | . | . | . | Súnda.       |
| VII    | . | . | . | Hatní.                  | XLV     | . | . | . | Bargáon.     |
| VIII   | . | . | . | Nándna.                 | XLVI    | . | . | . | Birona.      |
| IX     | . | . | . | Mátá-ká-húrá.           | XLVII   | . | . | . | Samáro.      |
| X      | . | . | . | Dáwa.                   | XLVIII  | . | . | . | Sitora.      |
| XI     | . | . | . | Sartal.                 | XLIX    | . | . | . | Atithol.     |
| XII    | . | . | . | Rangáon.                | L       | . | . | . | Tballi.      |
| XIII   | . | . | . | Kúsalpúrá.              | LI      | . | . | . | Khankharia.  |
| XIV    | . | . | . | Bánskati.               | LII     | . | . | . | Kosia.       |
| XV     | . | . | . | Pancháwa.               | LIII    | . | . | . | Gulásan.     |
| XVI    | . | . | . | Gurária.                | LIV     | . | . | . | Waladhar.    |
| XVII   | . | . | . | Khajúri.                | LV      | . | . | . | Dáwal.       |
| XVIII  | . | . | . | Nimthúr.                | LVI     | . | . | . | Rajúra.      |
| XIX    | . | . | . | Dhamnár.                | LVII    | . | . | . | Sarla.       |
| XX     | . | . | . | Rámpúrá.                | LVIII   | . | . | . | Dhingpúra.   |
| XXI    | . | . | . | Búda.                   | LIX     | . | . | . | Honitáli.    |
| XXII   | . | . | . | Nanka Húáro.            | LX      | . | . | . | Támpi.       |
| XXIII  | . | . | . | Aramlia.                | LXI     | . | . | . | Akoria.      |
| XXIV   | . | . | . | Bálagarra.              | LXII    | . | . | . | Didáwa.      |
| XXV    | . | . | . | Gopálpúra.              | LXIII   | . | . | . | Sohági.      |
| XXVI   | . | . | . | Mendki.                 | LXIV    | . | . | . | Bhilgáon.    |
| XXVII  | . | . | . | Barra Sádri.            | LXV     | . | . | . | Gangasára.   |
| XXVIII | . | . | . | Sánd.                   | LXVI    | . | . | . | Jhúnd.       |
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| XXX    | . | . | . | Borikalor.              | LXVIII  | . | . | . | Alam-Shahar. |
| XXXI   | . | . | . | Bharak.                 | LXIX    | . | . | . | Káribhit.    |
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| XXXIII | . | . | . | Tiki.                   | LXXI    | . | . | . | Lúnki.       |
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## KARACHI LONGITUDINAL SERIES.

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| LXXIII   | . | . | . | . | Dhárindera.       | XCIH    | . | . | . | . | Shá-Tureh.              |
| LXXIV    | . | . | . | . | Arniála.          | XCIV    | . | . | . | . | Nidamáni.               |
| LXXV     | . | . | . | . | Rojhra.           | XCV     | . | . | . | . | Alamkhán.               |
| LXXVI    | . | . | . | . | Fulrá.            | XCVI    | . | . | . | . | Hakimáni.               |
| LXXVII   | . | . | . | . | Drábi.            | XCVII   | . | . | . | . | Kát-báman.              |
| LXXVIII  | . | . | . | . | Sandohar.         | XCVIII  | . | . | . | . | Kakeja.                 |
| LXXIX    | . | . | . | . | Kíl.              | XCIX    | . | . | . | . | Nága-Sha.               |
| LXXX     | . | . | . | . | Chánga.           | C       | . | . | . | . | Chútli.                 |
| LXXXI    | . | . | . | . | Búgia.            | CI      | . | . | . | . | Kaná.                   |
| LXXXII   | . | . | . | . | Pádría.           | CII     | . | . | . | . | Hilaia.                 |
| LXXXIII  | . | . | . | . | Sodáchar.         | CIII    | . | . | . | . | Dadúri.                 |
| LXXXIV   | . | . | . | . | Manjákar.         | CIV     | . | . | . | . | Károthol.               |
| LXXXV    | . | . | . | . | Mairáb-ká-Shahar. | CV      | . | . | . | . | Ghatána.                |
| LXXXVI   | . | . | . | . | Amírsha.          | CVI     | . | . | . | . | Kára.                   |
| LXXXVII  | . | . | . | . | Farráha.          | CVII    | . | . | . | . | Sáhiji.                 |
| LXXXVIII | . | . | . | . | Pangra.           | CVIII   | . | . | . | . | Kúni.                   |
| LXXXIX   | . | . | . | . | Ján Mahamad.      | CIX     | . | . | . | . | Sáwaji.                 |
| XC       | . | . | . | . | Adúri.            | (XXIII) | . | . | . | . | Bol.                    |
| XCI      | . | . | . | . | Khori.            | (XXV)   | . | . | . | . | (of base-line figures). |
| XCII     | . | . | . | . | Dang-ka-basti.    |         |   |   |   |   | Bolálio.                |
|          |   |   |   |   |                   |         |   |   |   |   | (of base-line figures). |

## KARACHI LONGITUDINAL SERIES.

## DESCRIPTION OF STATIONS.



(III.) Súrantál Hill Station. For description, see base-line figures.

(IV.) Kámkherá Hill Station. For description, see base-line figures.

I. Losalli Station, lat.  $24^{\circ} 6'$ , long.  $77^{\circ} 36'$ , is situated in the Sironj district of the Tonk territory,  $1\frac{1}{2}$  miles W. of Pagrami, and the same distance S.E. of Bará Losalli, on a gentle undulation of the high table-land which rises immediately to the west of the Sironj valley. Some of the circumjacent villages are as follows:—Manakherí, N. 2.33 miles; Alinagar, W. 0.85 miles, and Bogra, S.E. 3.39 miles.

The pillar is solid,  $14\frac{1}{2}$  feet high, and has the usual mark-stones at top and bottom, besides two intermediate ones at 5 and 10 feet respectively above the lower mark.

II. Agar Hill Station, lat.  $23^{\circ} 57'$ , long.  $77^{\circ} 27'$ , is situated on a high ridge of a mass of hills in the Tonk territory and Sironj district, at about a mile E. of the hamlet of Agar, and 2 miles S.S.W. of the village of Tenolí. The spot on which the station is fixed is also called by the natives Katarerí pathar.

The pillar is solid, 4 feet in diameter, and 4 feet high, and has the usual mark-stones at top and bottom.

III. Tinsiá Hill Station, lat.  $24^{\circ} 6'$ , long.  $77^{\circ} 21'$ , is in the Tonk territory on the western border of the Sironj district, at  $\frac{1}{2}$  mile S. of the small village of Tinsiá, and 5 miles W.S.W. of Isarwás.

The pillar is solid, and 4 feet in diameter. It is 5 feet high, and has mark-stones at top and bottom.

IV. Rámpúr Hill Station, lat.  $24^{\circ} 18'$ , long.  $77^{\circ} 28'$ , is situated on the highest peak of a double-headed hill in the Iságarh suba and Aráon district of Sindíá's territory, at 1.38 miles S.W. of the village of Rámpúr, and 4 miles S. of Aráon.

The pillar is solid, 4 feet 11 inches high, and has the usual mark-stones at top and bottom.

V. Salot Hill Station, lat.  $24^{\circ} 15'$ , long.  $77^{\circ} 17'$ , is situated on a high peak in the

territory of the chieftain of Garhá, and immediately east of the valley of the Parbattí. The village of Gaddiá lies about  $\frac{1}{4}$  of a mile to the E.S.E., and that of Salot about 3 miles to the west of the station.

The pillar is solid, and 3 feet high. It has two mark-stones, one at top, and the other on a level with the summit of the hill.

VI. Dand Hill Station, lat.  $24^{\circ} 4'$ , long.  $77^{\circ} 9'$ , is situated in the Napanirá pargana of the territory of the Rájá of Rájgarh, at about 2 miles N.E. of the village of Napanír, and 3 miles south of Tehlí.

The pillar, 4 feet high, is solid, and has two mark-stones, one at top and the other at bottom.

VII. Hatní Hill Station, lat.  $24^{\circ} 30'$ , long.  $77^{\circ} 16'$ , is in the Danáda division of the Ragogarh state, and on a high peak of the range of hills extending northwards from Ragogarh. The cantonment of Gooná is distant N.N.W. about 12 miles.

The pillar, 6 feet high, is solid, and has three mark-stones, one at top, another at bottom, and a third at mid-height.

VIII. Nándna Hill Station, lat.  $24^{\circ} 22'$ , long.  $77^{\circ} 1'$ , is situated on one of the isolated hills forming the western boundary of the valley of the Parbattí river, in the Kumráj district of the Gwalior territory. The village of Piperiá, which lies near the foot of the hill, is about a mile S.S.W. of the station.

The pillar, 4 feet high, is solid, and has two mark-stones, one at top, and the other on a level with the summit of the hill.

IX. Mátá-ká-húra Hill Station, lat.  $24^{\circ} 14'$ , long.  $76^{\circ} 39'$ , is situated on a high hill in a wild and hilly tract appertaining to the Rájá of Kilchepúr. The circumjacent villages are Dhand, at about  $1\frac{1}{2}$  miles E.; Rosúldiá, 1 mile N.W., and Mawá-kherá  $1\frac{1}{2}$  miles N.

The pillar, 4 feet high, is solid, and has the usual mark-stones at top and bottom.

X. Dáva Hill Station, lat.  $23^{\circ} 49'$ , long.  $76^{\circ} 39'$ , is on the highest point of an isolated hill so named in the Kujnehr district of the Narsinghar state, and close to the northern boundary of that state. The village of Cháorapúr lies about a mile to the S.E., and that of Bakher is distant about 2 miles to the W.N.W.

The pillar is solid, and 3 feet high. It has the usual mark-stones at top and bottom.

XI. Sartal Hill Station, lat.  $24^{\circ} 30'$ , long.  $76^{\circ} 40'$ , is situated upon a high range of hills in the territory of the Rájá of Pátan. The town of Sartal is distant 1.55 miles, its azimuth being  $37^{\circ} 25'$ .

The pillar, 4 feet high, is solid, and has the usual mark-stones at top and bottom.

XII. Rangáon Hill Station, lat.  $23^{\circ} 55'$ , long.  $76^{\circ} 26'$ , is on the highest point of an isolated hill, the northern half of which belongs to the Jírápúr district of Holkar's territory, and the southern half to the Chaperá pargana of the Narsinghar state. The village of Rangáon

is distant about a mile to the S.E.; Berkherí about  $1\frac{1}{2}$  miles S.; Bánskherí about  $1\frac{1}{2}$  miles N.W., and Jharmáo about  $1\frac{1}{2}$  miles N.W.W.

The pillar is solid, and 4 feet high. It has two mark-stones, one at the top, and the other on a level with the summit of the hill.

XIII. Kúsalpúrá Hill Station, lat.  $24^{\circ} 18'$ , long.  $76^{\circ} 22'$ , is situated near the northern boundary of the Jhallawar state, in the Haráotí district of the province of Ajmere. The village of Kúsalpúrá is distant about  $\frac{1}{4}$  mile W.

The pillar is 8 feet high, and has four mark-stones, one at top, another at bottom, and two others at distances of 3 and 6 feet respectively from the latter.

XIV. Bánskati Hill Station, lat.  $24^{\circ} 35'$ , long.  $76^{\circ} 18'$ , is situated upon the crest of a bold ridge of hills, in the territories of the Rájá of Pátan. The small village of Bánskati lies at the foot of the hills, to the E., and the city of Pátan is distant about 8 miles in the opposite direction.

The pillar is solid, and is 4.42 feet high. It has two mark-stones, one at bottom, and the other at top.

XV. Pancháwa Hill Station, lat.  $24^{\circ} 8'$ , long.  $75^{\circ} 59'$ , is in the territories of the Nawab of Tonk. It derives its name from the group of five isolated hills, on the most extensive one of which it is situated. The following villages lie around the station:—Haráotíá Kotrí, N.; Sarangá-Kherá, N.E. by N.; Parawá, a large village, N.E.; Dhablá, S.; Ramaiá, W. by S.; and Náoli N.W.

The pillar is solid, and 3 feet high. It has two mark-stones, one placed at top, the other at the bottom.

XVI. Gurária Hill Station, lat.  $24^{\circ} 26'$ , long.  $76^{\circ} 7'$ , is fixed upon the eastern half of a small low isolated hill, and is in the territories of Holkar. The western portion of the hill is in the Pátan state. The circumjacent places are as follows:—The village of Gurária, distant about a mile to the southward, the large town of Sunail, about five miles in the same direction, and the city of Pátan, 13.704 miles to the N.E.

The pillar is  $4\frac{1}{2}$  feet high, and is solid. It has a mark-stone at the top, and another at bottom.

XVII. Khajúri Hill Station, lat.  $24^{\circ} 14'$ , long.  $75^{\circ} 46'$ , is fixed on a small isolated flat-topped hill in Holkar's territories. The circumjacent villages are as follows:—Nerkherá, N.W. by W. 2 miles; Samelí, N.  $2\frac{1}{2}$  miles; Kotrá, a large village, E. 1 mile; Khajúri, S.S.W. 1 mile.

The pillar is solid, and 3 feet in height. It has a mark-stone at top, and another at bottom.

XVIII. Nimthúr Hill Station, lat.  $24^{\circ} 32'$ , long.  $75^{\circ} 50'$ , is situated in Holkar's territories, and N.E. of the large town of Bhanpúr, on the high range of hills that runs continuously from that town to Rámpúrá. The village of Nimthúr lies about a mile to the eastward, at the foot of the hills.

The pillar, 8 feet  $10\frac{1}{2}$  inches in height, is solid, and has three mark-stones, one at top, another at bottom, and the third 4 feet above the latter.

XIX. Dhamnár Hill Station, lat.  $24^{\circ} 12'$ , long.  $75^{\circ} 32'$ , is situated in Holkar's territories, on an irregular group of hills, celebrated for the curious "Dhamnár Caves," or excavated temples. The station is within a few feet, and north of the principal temple.

From want of time the pillar could not be built of masonry. It consists of three large stones placed in a triangular form, height 0.75 feet.

XX. Rámpúrá Hill Station, lat.  $24^{\circ} 29'$ , long.  $75^{\circ} 29'$ , is situated in Holkar's territories, about a mile north of the large town of Rámpúrá, and on a high range of hills.

The pillar, 6 feet 9 inches in height, is solid, and carries three mark-stones, one at top, another at bottom, and the third three feet above the latter.

XXI. Búda Station, lat.  $24^{\circ} 14'$ , long.  $75^{\circ} 11'$ , is situated in Holkar's territories. The following villages lie around the station, viz.: Búda, 1 mile N.E.; Ger-rawud, due E. 2 miles; Talláopiplá, E. by S. one-fifth of a mile; Bájpur, S.W. 0.8 mile.

Four mark-stones are placed in the solid pillar, which is 5.2 feet high, viz.: at level of foundation, 1.23 and 2.75 above it, and on top of pillar.

XXII. Nanka Húáro Hill Station, lat.  $24^{\circ} 32'$ , long.  $75^{\circ} 17'$ , is situated in Holkar's territories, on the southern edge of the same extensive flat-topped range as Rámpúrá H. S. and Nimthúr H. S. The circumjacent villages are as follows:—Mota Soára to the N. about 2 miles; Nanka Húáro, N.E. by N. about  $1\frac{1}{2}$  miles; Mokrí, W. by N. about 3 miles; Kherawudda, S. about  $1\frac{1}{2}$  miles.

The pillar is solid, and  $7\frac{1}{2}$  feet high. It has a mark-stone at bottom, and another at top.

XXIII. Aramlia Station, lat.  $24^{\circ} 25'$ , long.  $75^{\circ} 2'$ , is in the Jawud Neemuch district. The following villages lie near the station, viz.: Deori, N. 2 miles; Bijurwas, N.W. by N.  $1\frac{1}{2}$  miles; Kana-Kherá, N.W.  $1\frac{1}{2}$  miles; Rattrio, W. 2 miles; Palsora, or Parorá, a large village, S.E. by S. 4 miles; Aramlia, E. 1 mile.

The pillar is solid, and 5.42 feet high. It carries a mark-stone at the bottom, another 2 feet higher, and a third at the surface.

XXIV. Bálagarra Hill Station, lat.  $24^{\circ} 10'$ , long.  $75^{\circ} 0'$ , is situated on a high range of table-land, in zilla Jawud Neemuch. The village of Bálagarra is at the foot of the hill, and distant about three miles.

The pillar is solid, and 3 feet in height. It has a mark-stone at top, and a mark on the rock *in situ*.

XXV. Gopálpúra Hill Station, lat.  $24^{\circ} 18'$ , long.  $74^{\circ} 49'$ , is situated in the Jawud Neemuch district, on a range of wild hills, inhabited chiefly by Bhíls. The village of Gopálpúra is about  $1\frac{1}{2}$  miles E., and that of Chota Kherá about 3 miles N.E. of the station.

The pillar is solid, and 5.17 feet high. It carries a mark-stone at the bottom, another 2 feet higher, and a third at the top.

XXVI. Mendki Hill Station, lat.  $24^{\circ} 38'$ , long.  $74^{\circ} 56'$ , is situated in the dominions of the Rái á of Udaipur, on the southern edge of the same extensive flat range as Nimthúr H.S.,



Rámpúra H. S. and Nanka Huáro H. S. The town of Jawud Neemuch lies in the plain below the station towards the S.W. at a distance of 3 miles.

The pillar is solid, and 3·5 feet in height. It has a mark-stone at bottom, and another at top.

XXVII. Barra Sádri Hill Station, lat.  $24^{\circ} 23'$ , long.  $74^{\circ} 32'$ , is situated in the territories of the Ráná of Udaipúr, on a high and extensive group of hills lying to the east of the Araballa range. The ascent to the station commences at the town of Barra Sádri, distant in a direct line about 2 miles.

The pillar is solid, and 2 feet high. It has a mark-stone at top, and another at bottom.

XXVIII. Sánd Hill Station, lat.  $24^{\circ} 43'$ , long.  $74^{\circ} 35'$ , is on a irregular cluster of high hills in the Nimdhera district, appertaining to the Nawab of Tonk. The village from which the station derives its name is distant  $1\frac{1}{2}$  miles to the N.E.

The pillar is solid, and 3 feet high. It has three mark-stones—one at top, another at bottom, and a third 2 feet above the latter.

XXIX. Tána Hill Station, lat.  $24^{\circ} 43'$ , long.  $74^{\circ} 14'$ , is situated on the highest point of a well-known isolated hill, at the foot of which to the south lies the large village of Tána. It is in the pargana of Tána, in the Udaipúr territories.

The pillar is solid, and 2·5 feet high. It carries three mark-stones—one at top, another at level of foundation, and a third 2 feet above the latter.

XXX. Borikalor Hill Station, lat.  $24^{\circ} 21'$ , long.  $74^{\circ} 15'$ , is situated in the Vallícha pargana of the Udaipúr territories, in a wild and thinly populated tract of hilly country, forming the eastern outskirts of the Araballa range. The large town of Kanaór is distant about 8 miles to the north, and the large village of Vallícha about 2 miles east by south. The well-known Dehbar lake lies about 15 miles west by south.

The pillar is solid, and 4·0 feet high. It carries three mark-stones, one at level of foundation, the next 3 feet above, and the last at its surface.

XXXI. Bharak Hill Station, lat.  $25^{\circ} 8'$ , long.  $74^{\circ} 19'$ , is on the highest of a group of pointed hills rising from the extensive plain that lies to the east of the Araballa range. A temple dedicated to the goddess Bharka adjoins it on the south side. The station is in the Sanda pargana of the Udaipúr territories. The small village of Bharak lies at the foot of the hill, and the large town of Poatla is distant about 4 miles to the S.W.

The pillar is solid, and 2·9 feet high. It has a mark-stone at bottom, another 2 feet higher, and a third at top.

XXXII. Lakarwas Hill Station, lat.  $24^{\circ} 32'$ , long.  $73^{\circ} 52'$ , is situated on the range of high hills forming the eastern defence of the city of Udaipúr. The large village of Lakarwas is distant about half a mile from the foot of the hill to the westward.

The pillar is solid, and 2·8 feet high. It bears three mark-stones, one at bottom, another at top, and the third 1 foot below the latter.

XXXIII. Tiki Hill Station, lat.  $24^{\circ} 56'$ , long.  $73^{\circ} 53'$ , is fixed upon the highest of an irregular cluster of low hills, in pargana Nathdwára, territory Udaipúr. The large town of Nathdwára, celebrated for its sanctity, is east of the station.

The pillar is solid, and 3 feet high. It has three mark-stones inserted in it, one at top, another at bottom, and the third 2 feet above the latter.

XXXIV. Ter Hill Station, lat.  $24^{\circ} 47'$ , long.  $73^{\circ} 39'$ , stands upon the highest point of one of the ridges which rise from the plateau of the Araballas, in the Chalpakí pargana of the Udaipúr territories. The large town of Gogunda is distant 5.680 miles to the S.S.W., and the village of Búballá lies to the N.W. at 1.623 miles.

The pillar is solid, and 3 feet high. It has three mark-stones inserted in it, one at bottom, another 2 feet higher, and a third at top.

XXXV. Marwar Hill Station, lat.  $24^{\circ} 26'$ , long.  $73^{\circ} 35'$ , is situated upon a high ridge of the Araballa range, in the midst of a wild tract called the Bhílwára, from its being inhabited exclusively by Bhíls. The village of Jharol is distant about 3 miles to the west.

The pillar is solid, and 2.6 feet high. It has one mark-stone at surface, another 1 foot below, and a third at level of foundation.

XXXVI. Mál Niver Hill Station, lat.  $24^{\circ} 59'$ , long.  $73^{\circ} 39'$ , is situated in the Nallá pargana of the Udaipúr territories, on one of the clusters of hills rising from the plateau of the Araballas. It derives its name from Niver, the hill on which it stands, and Mál, a small village lying to the S.E. The large village of Samicha is distant about 4 miles to the N., and that of Atrumba is about 2 miles off in the same direction.

The pillar is solid, and 3 feet high. Mark-stones were placed, one at top, another at bottom, and a third 2 feet above the latter.

XXXVII. Zelio Hill Station, lat.  $24^{\circ} 34'$ , long.  $73^{\circ} 22'$ , is situated on the summit of one of the highest peaks of the Araballa range, in the midst of Bhílwára, in pargana Mírpúr of the Udaipúr dominions. The small town of Obgad lies about 2 miles S., and that of Júrah about 6 miles S.W. A small rude temple, built of loose stones, adjoins the S.E. corner of the platform.

The pillar is solid, and 3 feet high. It has one mark-stone at top, another at bottom, and a third 2 feet above the latter.

XXXVIII. Kánnagar Hill Station, lat.  $24^{\circ} 58'$ , long.  $73^{\circ} 21'$ , is fixed on a peak standing on the western flank of the Araballa range of mountains in the Jodhpúr territory. The cantonment of Ernipoora is distant about 19 miles to the S.E., Bijapúr is N.W. at about 7 miles.

The pillar is solid, and 3 feet high. It has a mark-stone at bottom, another 2 feet higher, and a third at top.

XXXIX. Belka Hill Station, lat.  $24^{\circ} 47'$ , long.  $73^{\circ} 12'$ , is situated on a high hill of the Araballa range in pargana Rohai of the Sarohi state, and is distant 24 miles from Mount Aboo.

The pillar is solid, and 5.6 feet high. A mark-stone was placed at bottom, another 2 feet higher, and a third at top.

XL. Márd Hill Station, lat.  $24^{\circ} 24'$ , long.  $73^{\circ} 0'$ , is in the Possína district of the Idar state, on a group of high hills forming a portion of the southern face of the Araballa range. The ascent to the station from the town of Possína is long and tedious.

The pillar is solid, and 3.75 feet high. A mark-stone was placed at top, a second at bottom, and a third 2 feet above the latter.

XLI. Bonik Hill Station, lat.  $25^{\circ} 4'$ , long.  $72^{\circ} 54'$ , is situated in the Sarohi territory, on the most prominent peak of a group of hills which lie about 25 miles north of Mount Aboo. These hills are unconnected with the Araballa range.

The pillar is solid, and 3 feet high. It has one mark-stone at surface, another 1 foot below, and a third at level of foundation.

XLII. Gúrú Sikkar Hill Station, lat.  $24^{\circ} 39'$ , long.  $72^{\circ} 49'$ , is situated on the highest pinnacle of Mount Aboo, in the territories of the Ráo of Sarohi, in Rajpootana. The small rock temple of the Gúrú Sikkar, a resort of pilgrims from all parts of India, adjoins the station platform towards the S.W.

The pillar is solid, and 3.5 feet high. It has a mark-stone at surface, and another engraved on the rock *in situ*.

XLIII. Jeráj Hill Station, lat.  $24^{\circ} 25'$ , long.  $72^{\circ} 32'$ , is situated on the summit of a high and extensive hill lying between Mount Aboo and Deesa. The hill is named after a deity said to reside at its foot. It stands upon the boundary between the Sarohi and Palhanpúr states, and is thus a fertile source of dissension among them.

No pillar could be built. The station mark is defined by a circle and dot engraved on a large rock forming the summit of the hill.

XLIV. Súnda Hill Station, lat.  $24^{\circ} 47'$ , long.  $72^{\circ} 28'$ , is situated in the Jallor district of the Jodhpúr dominions, upon the northern portion of an isolated group of high hills, about 24 miles west by north of Mount Aboo. The ascent to the station commences at the small village of Usmat, lying on the eastern side of the hill.

The pillar is solid, and 3.2 feet high. It has one mark-stone at top, another at level of foundation, and a third 2 feet above.

XLV. Bargáon Hill Station, lat.  $24^{\circ} 40'$ , long.  $72^{\circ} 17'$ , is situated in the Jodhpúr territory, on the highest point of a conspicuous isolated hill, about 2 miles S.W. of the town of Bargáon.

No pillar could be built. The station mark is defined by a circle and dot engraved on the naked rock.

XLVI. Birona Station, lat.  $24^{\circ} 27'$ , long.  $72^{\circ} 16'$ , is situated in the dominions of the Nawab of Palhanpúr, on the summit of a gentle swell of ground, about 1 mile from the village of Birona.

The pillar is 9 feet high. It has four mark-stones, one at bottom, the others 5, 8, and 9 feet respectively above it.

XLVII. Samáro Hill Station, lat.  $24^{\circ} 49'$ , long.  $72^{\circ} 16'$ , is situated in the Jodhpúr dominions, on the highest point of the easternmost of two irregular ranges of low hills. The large village of Malwára lies about 4 miles towards the east, and that of Marí is distant about 3 miles to the west.

The pillar is solid, and 2 feet high. It has two mark-stones, one at top, the other at the bottom.

XLVIII. Sitora Station, lat.  $24^{\circ} 31'$ , long.  $72^{\circ} 9'$ , is situated in the territories of the Nawab of Palhanpúr, on a high bank of sand, after which it is called. The circumjacent villages are as follows:—Rampúra, about  $1\frac{1}{2}$  miles N.; Vorú, about  $\frac{3}{4}$  miles W. by N.; Wadir, about 1 mile S., and the town of Dhanala, about 5 miles to the west.

The pillar is 6 feet high, having three mark-stones, one at top, another at bottom, and a third 5 above the latter.

XLIX. Atithol Station, lat.  $24^{\circ} 42'$ , long.  $72^{\circ} 6'$ , is situated in the territory of the Nawab of Palhanpúr, on a high bank or ridge of sand, about  $1\frac{1}{2}$  miles N.E. of the large village of Yeta.

The pillar is solid, and 3.3 feet high. A mark-stone was imbedded at surface, another at bottom, and a third 2 feet above the latter.

L. Thalli Station, lat.  $24^{\circ} 53'$ , long.  $72^{\circ} 4'$ , is situated on a swell of sand, in the Sachor pargana of the Jodhpúr dominions. The village of Gondao lies 6 miles off to the south, and that of Kurra 8 miles to the east.

The pillar is solid, and 5 feet high. It has two mark-stones, one at top, another at bottom.

LI. Khankharia Station, lat.  $24^{\circ} 37'$ , long.  $71^{\circ} 56'$ , is situated on a low swell of sand of the same name. The large village of Ninawa lies about  $3\frac{1}{2}$  miles to the N.E., and Baja village is distant about  $2\frac{1}{4}$  miles.

The pillar is 8 feet high. It carries five mark-stones, one at its base, and the others 2, 6, 7 and 8 feet respectively above it.

LII. Kosia Station, lat.  $24^{\circ} 47'$ , long.  $71^{\circ} 56'$ , is situated in the Sachor pargana of the Jodhpúr territories, on a low swell of sand. The village of Pairí is distant about 2 miles to the N., and the town Sachor lies about 9 miles off.

The pillar is 6 feet high. It has four mark-stones, one at top, another at bottom, and the other two at 2 and 5 feet respectively above the latter.

LIII. Gulásan Tower Station, lat.  $24^{\circ} 41'$ , long.  $71^{\circ} 46'$ , is situated in the Jodhpúr territory. The village of Gulásan is distant about 1 mile to the west, and the town of Sachor about 5 miles to the N.E.

The platform is 14.7 feet high. Five mark-stones were imbedded in the usual masonry pillar as follows: One at level of foundation, three others at 2, 8 and 14 feet successively above this level, and the fifth at the surface of pillar.

LIV. Waladhar Station, lat.  $24^{\circ} 32'$ , long.  $71^{\circ} 48'$ , is situated in the Palhanpúr territory on a knoll about 2 miles west by south of the village of Waladhar. The adjacent villages

are as follows:—Kahilgáon about 4 miles to the north, and Sohana about the same distance to the north-east.

The pillar is solid, and 12 feet high. It has four mark-stones, one at the bottom, the others at 5, 10, and 12 feet respectively above it.

LV. Dáwal Station, lat.  $24^{\circ} 51'$ , long.  $71^{\circ} 45'$ , is situated in the Sachor pargana of the Jodhpúr territories on a swell of sand, after which it is named. Dáwal village lies N.N.E. at 0.6 miles; Palrí S. at 2.0 miles; and Amlí S.S.W. at 2.4 miles.

The pillar is 6 feet high, and bears four mark-stones, one at bottom, the others at 2, 5, and 6 feet respectively above it.

LVI. Rajúra Tower Station, lat.  $24^{\circ} 35'$ , long.  $71^{\circ} 35'$ , is situated in the territories of the Nawab of Palhanpúr, on the site of the ancient village of Rajúra. The village of Saráo lies about 6 miles to the south.

The pillar is solid, and 25 feet high. It has eight mark-stones, one at the level of foundation, the others at 5, 10, 14, 15, 20, 24, and 25 feet respectively above it.

LVII. Sarla Station, lat.  $24^{\circ} 47'$ , long.  $71^{\circ} 37'$ , is situated in the Jodhpúr territory on a slightly elevated knoll, about 2 miles S.E. of Jámí.

The pillar is solid, and 2.17 feet high. A mark-stone was placed at top, and another at bottom.

LVIII. Dhingpúra Station, lat.  $24^{\circ} 44'$ , long.  $71^{\circ} 28'$ , is situated on a swell of sand in the Sachor pargana of the Jodhpúr territories. The village of Dhingpúra lies about 2 miles to the west.

The pillar is 14.25 feet high. It has seven mark-stones buried as follows:—One on a level with the bottom of the foundation, the others 3, 5, 10, 12, 13, and 14.25 feet respectively above it.

LIX. Honitáli Station, lat.  $24^{\circ} 35'$ , long.  $71^{\circ} 26'$ , is situated in the territories of the Nawab of Palhanpúr, on a low swell of sand, after which it is named. The village of Bannotri is about 2 miles to the south, and the eastern border of the desert is distant some 10 miles to the west.

The pillar is 1.25 feet high. It has two mark-stones, one at surface, the other below.

LX. Támpi Hill Station, lat.  $24^{\circ} 53'$ , long.  $71^{\circ} 30'$ , is situated on a low sandhill which stands on the eastern border of the Tharr, or Little-desert, and is in the Sachor pargana of the Jodhpúr territories. The village of Támpi lies to the S.E., distant about two miles.

The pillar is solid, and 6 feet high. It has a mark-stone at the level of the foundation, and others at 2, 5, and 6 feet respectively above it.

LXI. Akoria Station, lat.  $24^{\circ} 41'$ , long.  $71^{\circ} 19'$ , is situated in the Jodhpúr dominions upon a little mound, on the northern border of the Runn of Cutch. It takes its name after a village that formerly stood near its site. The large village of Khijriati is about 6 miles distant.

The pillar is 8 feet high. It has a mark-stone at the level of the foundation, and others at 1, 3, 7, and 8 feet respectively above it.

LXII. Didáwa Hill Station, lat.  $24^{\circ} 51'$ , long.  $71^{\circ} 21'$ , is on a sandhill in the Tharr, or Little-desert, and distant from the hamlet of Didáwa  $\frac{1}{4}$  of a mile. It is in the Jodhpúr territories.

The pillar is solid, and 2 feet high. A mark-stone was placed at the bottom of the foundation, two others at 1 and 2 feet respectively above it.

LXIII. Sohági Hill Station, lat.  $24^{\circ} 48'$ , long.  $71^{\circ} 10'$ , is situated in the Jodhpúr territories, on a sandhill in the Tharr, or Little-desert. The well-known town of Bakesar is distant about  $3\frac{1}{2}$  miles, and the village of Sohági is some  $\frac{1}{4}$  of a mile from the station.

The pillar is solid. It contains four mark-stones, one at bottom, another at top, and two others at 1 and 2 feet above the former.

LXIV. Bhilgáon Hill Station, lat.  $24^{\circ} 42'$ , long.  $71^{\circ} 7'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The village of Sammari, bearing  $16^{\circ}$  east of the ray to Jhund Station, is about 2 miles distant.

The pillar is solid, and 4 feet high. It carries four mark-stones, one at top, another at bottom, and the others 2 and 3 feet respectively above the latter.

LXV. Gangasára Hill Station, lat.  $24^{\circ} 59'$ , long.  $71^{\circ} 14'$ , is fixed on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The village of Gangasára is distant 2 or 3 miles towards the N.E., and Faglia village is about  $2\frac{1}{2}$  miles away.

The pillar is solid. It has a mark-stone at the level of its foundation, another at its upper surface, and a third 2 feet above the former.

LXVI. Jhund Hill Station, lat.  $24^{\circ} 48'$ , long.  $71^{\circ} 1'$ , is fixed on a sandhill in that part of the Tharr, or Little-desert, which appertains to Bhúj. The village of Jhund is distant about 2 miles.

The pillar is solid, and 3 feet high. It has three mark-stones, one at top, another at the bottom, and the third 2 feet above the latter.

LXVII. Virária Hill Station, lat.  $24^{\circ} 57'$ , long.  $71^{\circ} 5'$ , stands on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The large village of Jharpá is distant about 3 miles.

The pillar is solid, and 3 feet high. Three mark-stones are imbedded in it, one at the surface, another at the bottom, and the third 2 feet above the latter.

LXVIII. Alam-shahar Hill Station, lat.  $24^{\circ} 52'$ , long.  $70^{\circ} 53'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The azimuths and distances of circumjacent villages are as follows:—Lonía,  $312^{\circ} 56'$ ; miles, 2.5. Herar,  $93^{\circ} 46'$ ; miles, 6. Aoramar,  $178^{\circ} 26'$ ; miles, 4. Karúro,  $291^{\circ} 16'$ ; miles, 8.

The pillar is solid, and 3 feet high. It has one mark-stone at top, another at bottom, and a third 2 feet above the latter.

LXIX. Káribhit Hill Station, lat.  $25^{\circ} 0'$ , long.  $70^{\circ} 51'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The village of Basarnia is distant about 2·5 miles to the east.

The pillar is solid, and 3 feet high. Three mark-stones are placed in it, one at bottom, another at top, and a third at 1 foot below the latter.

LXX. Tugúsar Hill Station, lat.  $24^{\circ} 50'$ , long.  $70^{\circ} 39'$ , stands on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The azimuths and distances of circumjacent villages are as follows:—Dhobar,  $59^{\circ} 34'$ ; miles, 1·5. Thagasind,  $175^{\circ} 34'$ ; miles, 6. Kírar,  $251^{\circ} 24'$ ; miles, 7·5. Matteria,  $302^{\circ} 44'$ ; miles, 2. Tugúsar,  $29^{\circ} 44'$ ; miles, 0·5.

The pillar is solid, and 3 feet high. A mark-stone was placed at top, another at level of foundation, and the third 2 feet above the latter.

LXXI. Lúnki Hill Station, lat.  $24^{\circ} 58'$ , long.  $70^{\circ} 42'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The village of Dadia is S.E. at about 2 miles, and that of Janjí-ká-kúa N.W. at about 1·7 miles.

The pillar is solid, and 3 feet high. It bears three mark-stones, one at top, another at bottom, and a third 2 feet above the latter.

LXXII. Pakka Kothi Hill Station, lat.  $24^{\circ} 50'$ , long.  $70^{\circ} 27'$ , is on a sandbank in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The village of Bakria is distant about 4 miles to the S.E.

The pillar is solid, and 3 feet high. Three mark-stones were placed in it, one at bottom, another at top, and a third 1 foot below the latter.

LXXIII. Dhárindera Hill Station, lat.  $25^{\circ} 0'$ , long.  $70^{\circ} 27'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, appertaining to Bhúj. Dhárindera village is distant about  $\frac{3}{4}$  miles, at an azimuth of  $290^{\circ}$ .

The pillar is solid, and 9 feet high. Six mark-stones were imbedded in it as follows:—One at level of foundation, and the others 2, 4, 6, 8, and 9 feet respectively above it.

LXXIV. Arniála Hill Station, lat.  $24^{\circ} 48'$ , long.  $70^{\circ} 13'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The azimuths and distances of circumjacent villages are as follows:—Arniála,  $209^{\circ}$ ; miles, 1·5. Sonalba,  $277^{\circ}$ ; miles, 5. Akká Ráthar,  $81^{\circ}$ ; miles, 5. Badiar,  $165^{\circ}$ ; miles, 7.

The pillar is solid, and 6 feet high. It has four mark-stones, one at surface, another at bottom, and the others at 2 and 5 feet above the latter.

LXXV. Rojhra Hill Station, lat.  $24^{\circ} 57'$ , long.  $70^{\circ} 17'$ , is situated on a sandhill in that part of the Tharr, or Little-desert, appertaining to Bhúj. The village of Paríára is distant about  $3\frac{1}{2}$  miles to the N.N.W.

The pillar is solid, and 3 feet high. It contains three mark-stones, one at top, another at bottom, and a third 1 foot below the former.

LXXVI. Fulrár Hill Station, lat.  $24^{\circ} 53'$ , long.  $70^{\circ} 6'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The village of Fulrár is distant about 1 mile, at an azimuth of  $150^{\circ}$ .

The pillar is solid, and 3 feet high. It has three mark-stones, one at level of foundation, another 2 feet higher, and a third at upper surface.

LXXVII. Drábi Hill Station, lat.  $24^{\circ} 44'$ , long.  $70^{\circ} 6'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The following are the azimuths and distances of the circumjacent villages:—Islámkot (a town),  $285^{\circ}$ ; miles, 5. Kamra,  $175^{\circ}$ ; miles, 2.3. Dipiar,  $35^{\circ}$ , miles 2.5.

The pillar is solid, and 3 feet high. It carries three mark-stones, one at top, another at bottom, and a third 1 foot below the former.

LXXVIII. Sandohar Hill Station, lat.  $25^{\circ} 3'$ , long.  $70^{\circ} 1'$ , is situated on a sandhill in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The following are the azimuths and distances of circumjacent villages:—Sandohar,  $280^{\circ}$ ; miles, 0.5; and Arnará,  $155^{\circ}$ , miles 1.

The pillar is solid, and 3 feet high. It has three mark-stones, one at level of foundation, another 2 feet higher, and a third at upper surface.

LXXIX. Kíl Hill Station, lat.  $24^{\circ} 47'$ , long.  $69^{\circ} 50'$ , is situated on a sandhill so named in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The town of Mittí is distant about  $2\frac{1}{2}$  miles S.

The pillar is solid, and 3 feet high. It has three mark-stones, one at top, another at bottom, and a third at 2 feet above the latter.

LXXX. Chánga Hill Station, lat.  $24^{\circ} 59'$ , long.  $69^{\circ} 54'$ , is situated on a sandhill bearing that name in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The town of Chelar lies to the east at about  $3\frac{1}{2}$  miles.

The pillar is solid, and 3 feet high. Mark-stones were imbedded at top and bottom, and at 2 feet above the latter.

LXXXI. Búgia Hill Station, lat.  $24^{\circ} 56'$ , long.  $69^{\circ} 37'$ , is fixed on a sandhill so named in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The village of Haida is distant about  $1\frac{1}{2}$  miles W.

The pillar is solid, and 3 feet high. It carries three mark-stones, one at top, another at bottom, and a third 2 feet above the latter.

LXXXII. Pádria Hill Station, lat.  $24^{\circ} 44'$ , long.  $69^{\circ} 33'$ , is situated on a sandhill in that part of the Tharr, or Little-desert, which appertains to Bhúj. The following are circumjacent villages with their azimuths and distances:—Ladia,  $160^{\circ}$ ; miles, 1.0. Nabísar,  $242^{\circ}$ ; miles, 3.0. Kalián,  $357^{\circ}$ ; miles, 2.

The pillar is solid, and 3 feet high, and has three mark-stones, one at top, another at bottom, and a third 2 feet above the latter.



LXXXIII. Sodáchar Hill Station, lat.  $25^{\circ} 6'$ , long.  $69^{\circ} 45'$ , is situated on a sandhill, from which it derives its name, in that portion of the Tharr, or Little-desert, appertaining to Bhúj.

The pillar is solid, and 3 feet high. It has three mark-stones, one at the top, another at the bottom, and the third 2 feet above the latter.

LXXXIV. Manjákar Tower Station, lat.  $25^{\circ} 7'$ , long.  $69^{\circ} 30'$ , is situated in the Hyderabad Collectorate of Scinde. The azimuths and distances of circumjacent villages are as follows: Manjákar,  $192^{\circ}$ ; miles, 0.7. Shahokathar,  $264^{\circ}$ ; miles, 4. Kakúbíro,  $299^{\circ}$ ; miles, 3.

The pillar is 20 feet high, and has six mark-stones placed as follows:—One at level of foundation, the others 6, 12, 18, 19, and 20 feet above it.

LXXXV. Mairáb-ka-Shahar Tower Station, lat.  $24^{\circ} 50'$ , long.  $69^{\circ} 23'$ , is situated in the Hyderabad Collectorate of Scinde. The village of Mairáb-ká-Shahar is distant about 2 miles.

The pillar is 20 feet high. Six mark-stones were imbedded as follows:—One at level of foundation, the rest at 6, 12, 18, 19, and 20 feet above it.

LXXXVI. Amírsha Tower Station, lat.  $25^{\circ} 0'$ , long.  $69^{\circ} 23'$ , is situated in the Hyderabad Collectorate of Scinde. The village of Amírsha is only 70 yards away.

The pillar is 24 feet high, and carries six mark-stones, one at level of foundation, the others at 6, 12, 18, 23, and 24 feet above it.

LXXXVII. Farráha Tower Station, lat.  $24^{\circ} 56'$ , long.  $69^{\circ} 14'$ , is situated in the Hyderabad Collectorate of Scinde. The village of Farráha is distant 0.3 miles, azimuth  $120^{\circ}$ , and that of Sawun 0.8 miles, azimuth  $340^{\circ}$ .

The pillar is 15 feet in height. Mark-stones were placed as follows:—One at level of foundation, and the others at 6, 12, 14, and 15 feet respectively above it.

LXXXVIII. Pangra Tower Station, lat.  $24^{\circ} 46'$ , long.  $69^{\circ} 14'$ , is situated in the Hyderabad Collectorate of Scinde. The azimuths and distances of circumjacent villages are as follows: Pangra,  $342^{\circ}$ ; miles, 0.4. Khanghar,  $69^{\circ}$ ; miles, 2. Máhamad Alí Sand,  $153^{\circ} 22'$ ; miles, 2. Nurpower,  $217^{\circ} 52'$ ; miles, 2.5.

The pillar is 20 feet high. Mark-stones were placed in it as follows:—One at level of foundation, other five at 6, 12, 18, 19, and 20 feet respectively above it.

LXXXIX. Ján Mahamad Tower Station, lat.  $25^{\circ} 4'$ , long.  $69^{\circ} 15'$ , is situated in the centre of the village of that name in the Hyderabad Collectorate of Scinde.

The pillar is 10 feet high, and has four mark-stones, one at level of foundation, and the others at 6, 9, and 10 feet above it.

XC. Adúri Tower Station, lat.  $24^{\circ} 50'$ , long.  $69^{\circ} 6'$ , is situated in the Hyderabad Collectorate of Scinde. The nearest of several small villages bearing that name is distant about 1.5 miles N.N.E.

The pillar is 20 feet high, and carries six mark-stones, one at level of foundation, the others 6, 12, 18, 19, and 20 feet above it.

XCI. Khori Tower Station, lat.  $25^{\circ} 1'$ , long.  $69^{\circ} 6'$ , is situated in the Hyderabad Collectorate of Scinde at about 1 mile from the largest of the three villages after which it is named. The village of Kariana is distant  $2\frac{1}{4}$  miles, at an azimuth of  $350^{\circ}$ , and that of Raen 1.3 miles nearly due N.

The pillar is 15 feet high, and has five mark-stones imbedded in it, one at level of foundation, the others at 6, 12, 14, and 15 feet respectively above it.

XCII. Dang-ka-basti Tower Station, lat.  $24^{\circ} 55'$ , long.  $68^{\circ} 56'$ , is built in the centre of the village of that name, in the Hyderabad Collectorate of Scinde. Seidpúr village is distant about  $\frac{1}{2}$  mile N.W.

The pillar is 24 feet high, and has six mark-stones inserted as follows:—One at level of foundation, the others at 6, 12, 18, 23, and 24 feet above it.

XCIII. Shá Turel Tower Station, lat.  $24^{\circ} 46'$ , long.  $68^{\circ} 56'$ , is situated in the centre of the village of that name, and in the Hyderabad Collectorate of Scinde.

The pillar is 12 feet high, and carries four mark-stones, one at level of foundation, the others at 6, 11, and 12 feet respectively above it.

XCIV. Nidamáni Tower Station, lat.  $25^{\circ} 4'$ , long.  $68^{\circ} 54'$ , is situated in the Hyderabad Collectorate of Scinde, on the ruins of an ancient town, distant about 0.4 miles from the village of Nidamáni. Golám Alí Tandá (a town) is distant 2 miles N.N.E.

The pillar is 15 feet high, and has five mark-stones, one at level of foundation, the others at 6, 12, 14, and 15 feet above it.

XCV. Alam Khán Tower Station, lat.  $24^{\circ} 50'$ , long.  $68^{\circ} 46'$ , is situated in the Hyderabad Collectorate of Scinde. Alam Khán Sigari village is distant about 0.15 miles.

The pillar is 32 feet high, and carries eight mark-stones as follows:—One at level of foundation, the others 2, 8, 14, 20, 26, 31, and 32 feet respectively above it.

XCVI. Hakimáni Tower Station, lat.  $24^{\circ} 59'$ , long.  $68^{\circ} 45'$ , is situated in the Hyderabad Collectorate of Scinde. The adjacent villages are—Bilasand, distant about 0.6 miles, and Alipúr, at about 1.5 miles.

The pillar is 38 feet high. Mark-stones were imbedded as follows:—One at level of foundation, 8 others at 2, 8, 14, 20, 26, 32, 37, and 38 feet respectively above it.

XCVII. Kát-báman Tower Station, lat.  $24^{\circ} 53'$ , long.  $68^{\circ} 37'$ , stands on a high mound, the site of the ancient city of that name, in the Hyderabad Collectorate of Scinde. An old masjid stands at about 40 feet from the tower to the S.

The pillar is 18 feet high, and contains six mark-stones, one at level of foundation, the others at 2, 8, 14, 17, and 18 feet respectively above it.

XCVIII. Kakeja Tower Station, lat.  $24^{\circ} 43'$ , long.  $68^{\circ} 37'$ , is built 0.3 of a mile to the S.W. of the village so called, in the Hyderabad Collectorate of Scinde.

The pillar is 20 feet high. It carries six mark-stones, inserted as follows:—One at level of foundation, the others at 2, 8, 14, 19, and 20 feet above it.

**XCIX.** Nága-Sha Tower Station, lat.  $25^{\circ} 1'$ , long.  $68^{\circ} 37'$ , is situated 0.4 miles from the village of the same name in the Hyderabad Collectorate of Scinde.

The pillar is 37 feet high, and carries nine mark-stones, one at level of foundation, the others at 2, 8, 14, 20, 26, 32, 36, and 37 feet above it.

**C.** Chútli Tower Station, lat.  $24^{\circ} 46'$ , long.  $68^{\circ} 26'$ , is situated about  $1\frac{1}{2}$  miles N.W. of the village of Khorwa, in the Hyderabad Collectorate of Scinde.

The pillar is 44 feet high. It carries ten mark-stones, imbedded as follows:—One at bottom, and the others at 6, 12, 18, 24, 30, 36, 40, 43, and 44 feet above it.

**CI.** Kanád Tower Station, lat.  $24^{\circ} 56'$ , long.  $68^{\circ} 25'$ , is built close to and W. of the village of the same name in the Hyderabad Collectorate of Scinde. The following are circumjacent villages with their azimuths and distances:—Lairaní,  $295^{\circ}$ ; miles, 2.5. Dádu,  $125^{\circ}$ ; miles, 1. Dandí,  $170^{\circ}$ ; miles, 4.5.

The pillar is 42 feet high. Mark-stones were buried as follows:—One at level of foundation, and the others at 2, 8, 14, 20, 26, 32, 38, 41, and 42 feet respectively above it.

**CII.** Hilaiia Hill Station, lat.  $24^{\circ} 52'$ , long.  $68^{\circ} 5'$ , is about 1 mile from the west bank of the Indus, and within 200 yards of the main road running from Jherak to Taka. The village after which the station is named is about 4 miles.

The pillar is 3 feet high. It has three mark-stones, one at top, another at bottom, and a third 2 feet above the latter.

**CIII.** Dadúri Hill Station, lat.  $25^{\circ} 0'$ , long.  $68^{\circ} 13'$ , is situated about 300 yards from the west bank of the Indus, and 2 miles south-west of the large village of Súnda. It derives its name from a hunting preserve distant about  $\frac{1}{2}$  mile to the south.

The pillar is 3 feet high. It carries three mark-stones, one at top, another at bottom, and a third 2 feet above the latter.

**CIV.** Károthol Hill Station, lat.  $24^{\circ} 54'$ , long.  $67^{\circ} 56'$ , is situated in the Karáchí Collectorate of Scinde, on the highest part of a hill of the same name.

The pillar is 3 feet high. It has three mark-stones, one at top, another at bottom, and a third one foot below the former.

**CV.** Ghatána Hill Station, lat.  $25^{\circ} 4'$ , long.  $68^{\circ} 1'$ , is situated on the highest point of a long low isolated range about  $1\frac{1}{2}$  miles in length, and is distant 0.8 of a mile from the village after which it is called.

The pillar is 3 feet high. It carries three mark-stones, one at top, another at bottom, and the third 2 feet above the latter.

**CVI.** Kára Hill Station, lat.  $25^{\circ} 2'$ , long.  $67^{\circ} 42'$ , is situated on the southern of two points on the high hill so called

The pillar is 3 feet high. It carries three mark-stones, one at top, another at bottom, and the third 2 feet above the latter.

**CVII.** Sáhiji Hill Station, lat.  $24^{\circ} 51'$ , long.  $67^{\circ} 38'$ , is situated on a small mound on

the northern edge of a long flat range of hills, after which it is named. The well-known temple of Kanpitiání is about a mile and a-half to the north.

The pillar is 3 feet high. It has three mark-stones imbedded, one at top, another at bottom, and a third at 2 feet above the latter.

CVIII. Kúni Hill Station, lat.  $25^{\circ} 11'$ , long.  $67^{\circ} 48'$ , is situated on the highest part of the hill so called.

The pillar is 3 feet high. It has three mark-stones placed as usual, at top, bottom, and 2 feet above latter.

CIX. Sáwaji Hill Station, lat.  $25^{\circ} 14'$ , long.  $67^{\circ} 33'$ , is situated on the highest point of a high rocky hill of that name. No villages can be seen from the station.

The pillar is 3 feet high. It has three mark-stones, one at top, another at bottom, and the third at 1 foot below the former.

(XXV). Bolálio Hill Station (*for description, see base-line figures*).

(XXIII). Bol Hill Station (*for description, see base-line figures*).

(XXI). North End Base Tower Station (*for description, see base-line figures*).

(XXIV). Maio Hill Station (*for description, see base-line figures*).

(XX). South End Base Tower Station (*for description, see base-line figures*).

(XXII). Magar Pir Hill Station (*for description, see base-line figures*).



ADDENDUM TO DESCRIPTION OF STATIONS.

21\*—B.

NOTE.—Consequent on modern alterations of district and other boundaries, the sites occupied by the stations are now included in civil divisions of territory which differ frequently from the district, pargana or village, recorded in the preceding descriptions of stations: a suitably modified statement of the sub-divisions in question is accordingly given in the following table and is derived chiefly from the annual reports, up to 1873, made by the Civil Officials to whose care the stations have been committed.

It has become customary in modern times to erect a square protecting pillar at Principal Stations over the circular pillar on which the large theodolite stood and which carries the true mark-stone; the square pillar bears a sufficiently accurate mark for Topographical and Revenue Survey purposes, so that it is generally unnecessary to refer to the true mark-stone which thus remains concealed and protected. The stations which are protected in the manner described are indicated by ‡

| No.           | Local name           | District                        | Pargana &c. | Village                 | Remark                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|----------------------|---------------------------------|-------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (III) ‡       | Súrantál             | Sironj                          | Sironj      | Gopálpur                | Visited by Lt. C. Strahan, R.E., of the Topographical Survey in 1870, and reported by him to be in good order.<br>Platform repaired by Lt. C. Strahan, R.E., in 1870.<br>Lt. C. Strahan, R.E., on visiting these stations in 1870 found the isolated pillars and mark-stones had been removed, but the platforms were in fair order. He repaired the latter and inserted mark-stones in their centres which are probably within 1 foot of the true positions.<br>Lt. C. Strahan, R.E., in 1870 found this station almost completely obliterated. A small portion of the platform remained from which the position of the mark was estimated and a mark-stone placed there, probably within 1 or 2 feet of the true spot.<br>Visited by Mr. H. Bolst of the Topographical Survey in 1871 and reported by him to be in good order.<br>Mr. H. Bolst on visiting this station in 1871 found the mark-stones had been removed. He rebuilt the platform and inserted a mark-stone in it.<br>Found in good order by Lt. C. Strahan, R.E., in 1870.<br>Found in good order by Mr. H. Bolst in 1872. |
| (IV) ‡<br>I ‡ | Khámkhera<br>Losalli | "<br>"                          | "<br>"      | Imláni<br>Barra Losalli |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| II ‡          | Agar                 | "                               | "           | Tenoli                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| III ‡<br>IV ‡ | Tinsia<br>...        | "<br>Scindia                    | "<br>...    | Tinsia<br>Rámpur        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| V             | ...                  | "                               | ...         | Salot                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| VI            | Dand                 | Narsinagarh or<br>Rájgarh state | Nápánára    | Nápánára                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| VII ‡         | ...                  | Scindia                         | ...         | ...                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| VIII          | ...                  | "                               | ...         | ...                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| No.   | Local name | District                     | Pargana &c.              | Village       | Remark                                                                                                                                                                                                                                                                               |
|-------|------------|------------------------------|--------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IX    | ...        | Scindia                      | ...                      | ...           | Mr. H. Bolst in 1872 found the mark-stones removed. He repaired the station and left a mark-stone as nearly in position as he could estimate.                                                                                                                                        |
| X     | ...        | Narsinagarh or Rájgarh state | ...                      | ...           | Visited by Capt. J. R. Wilmer of the Topographical Survey in 1872. He found no isolated pillar, but only a platform with a hole in the centre from which the mark-stone had been removed. He built a pillar and placed a mark-stone in it corresponding to the hole above mentioned. |
| XI    | ...        | Jhálrápátan                  | ...                      | ...           | Mr. H. Bolst in 1872 found the mark-stones had been removed. He repaired the station and left a mark as nearly in position as he could estimate.                                                                                                                                     |
| XII   | Rangáon    | Narsinagarh or Rájgarh state | Chapera                  | Rangáon       | Capt. J. R. Wilmer of the Topographical Survey visited this station in 1873 and found the upper mark-stone had been removed. The station was otherwise in good order.                                                                                                                |
| XIII  | ...        | Jhálrápátan                  | ...                      | Kusálpura     | Mr. H. Bolst in 1872 found this station partially destroyed and repaired it.                                                                                                                                                                                                         |
| XIV   | ...        | "                            | ...                      | Bánskati      | Found in good order by Mr. H. Bolst in 1872.                                                                                                                                                                                                                                         |
| XV    | ...        | Tonk                         | ...                      | ...           | Found in good order by Lt. E. Leach, R.E., in 1873.                                                                                                                                                                                                                                  |
| XVI   | ...        | Holkar state                 | Sunail                   | Gurária       | Lt. E. Leach, R.E., on visiting this station in 1873 found the upper mark-stone removed and the platform dismantled.                                                                                                                                                                 |
| XVII  | ...        | "                            | Pargana Sathkhera Táluka | Khajúri Panth | Found in good order by Lt. E. Leach, R.E., in 1873.                                                                                                                                                                                                                                  |
| XVIII | ...        | "                            | Khásgi Bhánpura          | Ratanpur      | Lt. E. Leach, R.E., on visiting this station in 1873 found the upper mark-stone had been removed.                                                                                                                                                                                    |
| XIX   | ...        | "                            | Chandwása                | Dhamnár       | The precise position of this station was not recognised by Lt. E. Leach, R.E., who visited the hill in 1873, another station imilar to a principal station having been built in the neighbourhood.                                                                                   |

ADDENDUM TO DESCRIPTION OF STATIONS.

23\*—B.

| No.     | Local name       | District          | Pargana &c.           | Village                     | Remark                                                          |
|---------|------------------|-------------------|-----------------------|-----------------------------|-----------------------------------------------------------------|
| XX      | ...              | Holkar state      | Rámpura               | Rámpura                     | Found in good order by<br>Lt. E. Leach, R.E., in 1873.          |
| XXI     | ...              | "                 | Naráingarh            | Búda                        |                                                                 |
| XXII    | Hinglásgarh Stn. | "                 | Bhánpura              | Hinglásgarh                 |                                                                 |
| XXIII † | ...              | Gwalior Territory | Nímach (Nee-<br>much) | Aramlia                     |                                                                 |
| XXIV †  | ...              | Scindia           | ...                   | Bálagarra                   |                                                                 |
| XXV     | ...              | "                 | ...                   | Gopálpura                   |                                                                 |
| XXVI    | ...              | Udaipur           | ...                   | Mendki                      |                                                                 |
| XXVII   | ...              | "                 | ...                   | Sánd                        |                                                                 |
| XXVIII  | ...              | "                 | ...                   | Tána                        |                                                                 |
| XXIX    | ...              | "                 | ...                   | Vallicha                    |                                                                 |
| XXX     | ...              | "                 | Sanda                 | Bharak                      |                                                                 |
| XXXI    | ...              | "                 | ...                   | Lakarwas                    |                                                                 |
| XXXII   | ...              | "                 | Náthdwára             | ...                         |                                                                 |
| XXXIII  | ...              | "                 | Chalpaki              | ...                         |                                                                 |
| XXXIV   | ...              | "                 | ...                   | ...                         |                                                                 |
| XXXV    | ...              | "                 | Nalla                 | Mál                         |                                                                 |
| XXXVI   | ...              | "                 | Mírpur                | ...                         |                                                                 |
| XXXVII  | ...              | "                 | Godwár                | Khánnagar                   |                                                                 |
| XXXVIII | ...              | Jodhpur           | ...                   | ...                         |                                                                 |
| XXXIX   | ...              | Sirohi            | ...                   | ...                         |                                                                 |
| XL      | Mad              | Mahí kánta        | Edar                  | Posína                      | Protected by Mr. W. C.<br>Price of the G. T. Survey<br>in 1873. |
| XLI †   | ...              | Sirohi            | Kharoli               | Bán                         |                                                                 |
| XLII    | ...              | "                 | ...                   | ...                         |                                                                 |
| XLIII   | ...              | Pálanpur          | Dantewarra            | On the top of Jasor<br>hill |                                                                 |
| XLIV †  | ...              | Jodhpur           | Jalor                 | Usmat                       | Protected by Mr. W. C. Price<br>of the G. T. Survey in 1873.    |
| XLV     | ...              | "                 | "                     | Bargáon                     |                                                                 |
| XLVI    | ...              | Pálanpur          | Dísa                  | Birona                      |                                                                 |
| XLVII   | ...              | Jodhpur           | Jalor                 | Samáro                      |                                                                 |
| XLVIII  | ...              | Pálanpur          | Dhanera               | Woda                        |                                                                 |
| XLIX    | ...              | "                 | "                     | Yeta                        |                                                                 |
| L       | ...              | Jodhpur           | Sachor                | Thalli                      |                                                                 |
| LI      | ...              | Pálanpur          | Dhanera               | Ninowa                      |                                                                 |
| LII     | ...              | Jodhpur           | Sachor                | Kosia                       |                                                                 |
| LIII    | ...              | "                 | "                     | Gulásan                     | Tower in bad repair.                                            |
| LIV     | ...              | Pálanpur          | Tharád                | Waladhar                    |                                                                 |
| LV      | ...              | Jodhpur           | Sachor                | Dáwal                       | Tower in bad repair.                                            |
| LVI     | ...              | Pálanpur          | Tharád                | Rájkot                      |                                                                 |
| LVII    | ...              | Jodhpur           | Sachor                | Sarla                       |                                                                 |
| LVIII   | ...              | "                 | "                     | Dhingpura                   |                                                                 |
| LIX     | ...              | Pálanpur          | Wáo                   | Bálútri                     | Tower in bad repair.                                            |
| LX      | ...              | Jodhpur           | Sachor                | Támpi                       |                                                                 |
| LXI     | ...              | "                 | Baoatra               | Akoria                      |                                                                 |
| LXII    | ...              | "                 | Sachor                | Didáwa                      |                                                                 |
| LXIII   | ...              | "                 | "                     | Sohági                      |                                                                 |
| LXIV    | Dadraíwári Stn.  | Thar              | Táluka Nagar          | Dadrai                      |                                                                 |
| LXV     | ...              | Jodhpur           | Thánah Halla          | Gangasára                   |                                                                 |
| LXVI    | Jhund            | Thar              | Táluka Nagar          | Jhund of Gurgajes           |                                                                 |
|         |                  |                   | Thanah Halla          |                             |                                                                 |

| No.      | Local name                                       | District         | Pargana &c.                          | Village           | Remark                                                              |
|----------|--------------------------------------------------|------------------|--------------------------------------|-------------------|---------------------------------------------------------------------|
| LXVII    | ...                                              | Jodhpur          | Sachor                               | Virária           |                                                                     |
| LXVIII   | Dari between Tar<br>Lunia and Tar<br>Pabina Hill | Thar             | Táluka Nagar<br>Thánah Mittria       | Lunia, Sháhu Sánd |                                                                     |
| LXIX     | Káribhit                                         | "                | Táluka Nagar<br>Thánah Sati<br>Dhera | Labbárni          |                                                                     |
| LXX      | Tugúsar                                          | "                | Táluka Nagar<br>Thánah Pílu          | Tugúsar           |                                                                     |
| LXXI     | Lúnki                                            | "                | Táluka Chachera                      | Tar Dádio         |                                                                     |
| LXXII    | Pakka Kothi                                      | "                | " Mitti                              | Jáda-ka Tar       |                                                                     |
| LXXIII   | Dharindro                                        | "                | " Chachera                           | Dhárindra         |                                                                     |
| LXXIV    | Erniára                                          | "                | " "                                  | Erniára           |                                                                     |
| LXXV     | Rohro                                            | "                | " "                                  | Rohráro           |                                                                     |
| LXXVI    | Fulrábah                                         | "                | " "                                  | Fulrábah          |                                                                     |
| LXXVII   | Dabba Vari Dari                                  | "                | " Mitti                              | Dinárjo Kot       |                                                                     |
| LXXVIII  | Sadúhar                                          | "                | " Chachera                           | Aklo              |                                                                     |
| LXXIX    | Kíl                                              | "                | " Mitti                              | Jagario           |                                                                     |
| LXXX     | Chánga                                           | "                | " Chachera                           | Chelar            | Found entirely destroyed<br>in 1873 (district officer's<br>report). |
| LXXXI    | Búgia                                            | "                | " Umarmot                            | ...               |                                                                     |
| LXXXII   | Pádria                                           | "                | " Dípla                              | Pádria            | Found entirely destroyed<br>in 1873 (district officer's<br>report). |
| LXXXIII  | Sodáchar                                         | "                | " Umarmot                            | ...               |                                                                     |
| LXXXIV   | Manjákar                                         | "                | " "                                  | ...               |                                                                     |
| LXXXV    | ...                                              | Haidrabad (Sind) | ...                                  | Mairáb-ká-shahr   |                                                                     |
| LXXXVI   | ...                                              | "                | ...                                  | Amírsháh          |                                                                     |
| LXXXVII  | Pháráho                                          | "                | Khairpur                             | Pháráho           |                                                                     |
| LXXXVIII | Bhawra                                           | "                | Pungrio                              | Phiári            |                                                                     |
| LXXXIX   | Ján Muhammad                                     | "                | Gújo                                 | Garbar            |                                                                     |
| XC       | Adúri                                            | "                | Somro Kalloi                         | Adúri             |                                                                     |
| XCI      | Chanesar Kalloi                                  | "                | Sarmást Lagari                       | Kariano           |                                                                     |
| XCII     | Vassi                                            | "                | Kurram Khán<br>Jamáli                | Sayidpur          |                                                                     |
| XCIII    | Sháh Turel                                       | "                | Khádo                                | Durmáno           |                                                                     |
| XCIV     | Ali Bux Nizámáni                                 | "                | Háji Saurin                          | Thari             |                                                                     |
| XCv      | Dauki                                            | "                | Tappa Jamo<br>Jakhrio                | Dauki             |                                                                     |
| XCVI     | Dábgari                                          | "                | " "                                  | Dábgari           |                                                                     |
| XCvII    | Kathbambhan                                      | "                | Tappa Tándá<br>Ghulám Haidar         | Kathbambhan       |                                                                     |
| XCvIII   | Kekeja                                           | "                | Agri                                 | Kekeja            |                                                                     |
| XCIX     | Nangu Sháh                                       | "                | Tappa Tándá<br>Ghulám Haidar         | Doderá            |                                                                     |
| C        | Chútri                                           | "                | Khorwa                               | Lakhi             |                                                                     |
| CI       | Kanádáni                                         | "                | Bulri                                | Kanádáni          |                                                                     |
| CII      | Hiláyánjo Thul                                   | Karáchi          | Division Jerak<br>Táluka Tatta       | Deh Hiláya        | Reported in good condi-<br>tion in 1871.                            |
| CIII     | Dadúrijo Thul                                    | "                | " "                                  | Deh Súnda         |                                                                     |
| CIV      | Károthul                                         | "                | " "                                  | Suf Shoro         |                                                                     |
| CV       | Ghalanjo Thul                                    | "                | " "                                  | Khudái            |                                                                     |
| CVI      | ...                                              | "                | ...                                  | ...               |                                                                     |
| CVII     | ...                                              | "                | ...                                  | ...               |                                                                     |



ADDENDUM TO DESCRIPTION OF STATIONS.

25\*—B.

| No.     | Local name        | District | Pargana &c.    | Village                              | Remark |
|---------|-------------------|----------|----------------|--------------------------------------|--------|
| CVIII   | Koni Thulo        | Karáchi  | Kohistán       | Kulhejo Khur                         |        |
| CIX     | Thulo Jubul Sháh- | "        | "              | Pud Kani                             |        |
| (XXIII) | wajji<br>Bor      | "        | Táluka Karáchi | Mallir Makán                         |        |
| (XXV)   | Bolári            | "        | " "            | Darsáno Chúto<br>Hubb Makán<br>Thudo |        |



## KARACHI LONGITUDINAL SERIES.

## OBSERVED ANGLES.



| At (III)                                                                                                         |                                              |                |                |                |                |                |                |                |                                                                                       |                                                                                             |
|------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <i>February 1849, observed by Captains T. Renny and A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                |                |                |                |                |                |                |                                                                                       |                                                                                             |
| Angle between                                                                                                    | Circle readings, telescope being set on (IV) |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |                                                                                             |
|                                                                                                                  | 0° 1'                                        | 180° 1'        | 9° 17'         | 189° 17'       | 18° 33'        | 198° 33'       | 27° 49'        | 207° 49'       |                                                                                       |                                                                                             |
| (IV) & I                                                                                                         | "                                            | "              | "              | "              | "              | "              | "              | "              | "                                                                                     | <i>M</i> = 1''·31<br><i>w</i> = 4·50<br>$\frac{1}{w}$ = 0·22<br><i>C</i> = 49° 10' 1''·32   |
|                                                                                                                  | <i>h</i> 60'96                               | <i>l</i> 58'80 | <i>l</i> 60'60 | <i>l</i> 61'20 | <i>l</i> 61'42 | <i>l</i> 60'06 | <i>l</i> 60'52 | <i>l</i> 62'34 | <i>l</i> 63'36                                                                        |                                                                                             |
|                                                                                                                  | <i>h</i> 61'06                               | <i>l</i> 58'70 | <i>l</i> 60'68 | <i>l</i> 61'66 | <i>l</i> 63'06 | <i>l</i> 61'36 | <i>l</i> 62'96 | <i>l</i> 63'36 | <i>l</i> 63'36                                                                        |                                                                                             |
|                                                                                                                  | <i>h</i> 61'02                               | <i>l</i> 58'30 | <i>l</i> 61'70 | <i>h</i> 61'32 | <i>l</i> 63'08 | <i>l</i> 62'40 | <i>l</i> 62'28 | <i>l</i> 62'08 | <i>l</i> 63'12                                                                        |                                                                                             |
|                                                                                                                  | 61'01                                        | 58'60          | 60'99          | 61'39          | 62'67          | 61'27          | 61'92          | 62'59          |                                                                                       |                                                                                             |
| I & IV                                                                                                           | <i>h</i> 22'46                               | <i>l</i> 22'34 | <i>l</i> 23'30 | <i>l</i> 24'48 | <i>l</i> 25'24 | <i>l</i> 23'48 | <i>l</i> 22'20 | <i>l</i> 22'22 | <i>l</i> 21'88                                                                        | <i>M</i> = 22''·86<br><i>w</i> = 8·67<br>$\frac{1}{w}$ = 0·12<br><i>C</i> = 63° 38' 22''·88 |
|                                                                                                                  | <i>h</i> 22'48                               | <i>l</i> 22'74 | <i>l</i> 23'86 | <i>l</i> 24'88 | <i>l</i> 25'04 | <i>l</i> 21'72 | <i>l</i> 21'74 | <i>l</i> 21'88 | <i>l</i> 21'02                                                                        |                                                                                             |
|                                                                                                                  | <i>l</i> 24'60                               | <i>l</i> 23'06 | <i>l</i> 24'46 | <i>h</i> 21'62 | <i>l</i> 22'74 | <i>l</i> 22'20 | <i>l</i> 22'04 | <i>l</i> 21'02 | <i>l</i> 21'02                                                                        |                                                                                             |
|                                                                                                                  | <i>l</i> 22'92                               |                |                | <i>h</i> 21'16 | <i>l</i> 22'88 |                |                |                |                                                                                       |                                                                                             |
|                                                                                                                  | 23'12                                        | 22'71          | 23'87          | 23'04          | 23'98          | 22'47          | 21'99          | 21'71          |                                                                                       |                                                                                             |

NOTE.—(III) and (IV) appertain to base-line figures.

| At (IV)                                                                                                         |                       |          |          |          |          |          |          |          |                                                                                                 |                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------|-----------------------|----------|----------|----------|----------|----------|----------|----------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <i>January 1849, observed by Captains T. Renny and A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                       |          |          |          |          |          |          |          |                                                                                                 |                                                                                                 |
| Angle between                                                                                                   | Lesser Circle-reading |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle           |                                                                                                 |
|                                                                                                                 | 0° 2'                 | 180° 2'  | 9° 2'    | 189° 3'  | 18° 4'   | 196° 3'  | 27° 2'   | 207° 2'  |                                                                                                 |                                                                                                 |
| II & I                                                                                                          | "                     | "        | "        | "        | "        | "        | "        | "        | "                                                                                               | <i>M</i> = 55''·03<br><br><i>w</i> = 11·48<br>$\frac{1}{w}$ = 0·09<br><i>C</i> = 45° 4' 55''·23 |
|                                                                                                                 | h 52'58               | l 53'36  | h 53'56  | l 58'28  | l 55'46  | h 54'26  | h 53'00  | l 57'54  |                                                                                                 |                                                                                                 |
|                                                                                                                 | h 55'18               | h 53'94  | h 54'54  | l 56'18  | l 55'34  | l 56'56  | l 56'16  | l 56'48  |                                                                                                 |                                                                                                 |
|                                                                                                                 | h 55'02               | h 53'94  | h 53'54  | l 55'04  | l 54'14  | l 55'50  | l 54'86  | l 56'22  |                                                                                                 |                                                                                                 |
|                                                                                                                 | 54'26                 | 53'75    | 53'88    | 56'50    | 54'98    | 55'44    | 54'67    | 56'75    |                                                                                                 |                                                                                                 |
| Lesser Circle-reading                                                                                           | 286° 7'               | 106° 7'  | 295° 14' | 115° 14' | 304° 3'  | 124° 9'  | 313° 10' | 133° 10' |                                                                                                 |                                                                                                 |
| II & I                                                                                                          | h 57'04               | l 53'28  | h 54'12  | h 58'66  | h 53'98  | h 53'72  | l 55'82  | l 55'96  | <i>M</i> = 55''·39<br><br><i>w</i> = 15·85<br>$\frac{1}{w}$ = 0·06<br><i>C</i> = 45° 32' 9''·17 |                                                                                                 |
|                                                                                                                 | h 55'36               | l 54'60  | h 54'70  | l 58'10  | l 56'46  | h 54'32  | l 56'36  | l 53'84  |                                                                                                 |                                                                                                 |
|                                                                                                                 | l 56'56               | l 54'68  | h 56'70  | l 54'82  | l 56'02  | h 54'68  | l 54'90  | l 56'16  |                                                                                                 |                                                                                                 |
|                                                                                                                 |                       |          | l 56'72  |          |          | h 53'74  | l 54'70  |          |                                                                                                 |                                                                                                 |
|                                                                                                                 | 56'32                 | 54'19    | 55'17    | 57'08    | 55'49    | 54'12    | 55'45    | 55'32    |                                                                                                 |                                                                                                 |
| Lesser Circle-reading                                                                                           | 45° 7'                | 225° 7'  | 54° 7'   | 234° 8'  | 63° 9'   | 243° 10' | 72° 7'   | 252° 7'  |                                                                                                 |                                                                                                 |
| I & (III)                                                                                                       | h 11'66               | h 10'34  | h 11'80  | l 7'74   | l 10'00  | h 11'54  | h 11'08  | h 9'20   | <i>M</i> = 10''·19<br><br><i>w</i> = 15·85<br>$\frac{1}{w}$ = 0·06<br><i>C</i> = 45° 32' 9''·17 |                                                                                                 |
|                                                                                                                 | h 10'48               | l 11'40  | h 12'00  | l 8'70   | l 8'22   | h 10'18  | h 9'96   | h 9'78   |                                                                                                 |                                                                                                 |
|                                                                                                                 | h 10'42               | l 9'70   | h 11'62  | l 9'14   | l 11'56  | h 10'12  | h 9'68   | l 8'16   |                                                                                                 |                                                                                                 |
|                                                                                                                 | 10'85                 | 10'48    | 11'81    | 8'53     | 9'93     | 10'61    | 10'24    | 9'05     |                                                                                                 |                                                                                                 |
| Lesser Circle-reading                                                                                           | 331° 12'              | 151° 12' | 340° 15' | 160° 19' | 349° 14' | 169° 14' | 358° 15' | 178° 15' |                                                                                                 |                                                                                                 |
| I & (III)                                                                                                       | h 9'64                | l 7'40   | h 10'16  | h 8'12   | h 9'42   | h 10'98  | l 6'76   | l 7'32   | <i>M</i> = 8''·48<br><br><i>w</i> = 15·85<br>$\frac{1}{w}$ = 0·06<br><i>C</i> = 45° 32' 9''·17  |                                                                                                 |
|                                                                                                                 | h 8'18                | l 7'90   | h 8'50   | l 8'04   | l 7'44   | h 8'20   | l 7'48   | l 8'62   |                                                                                                 |                                                                                                 |
|                                                                                                                 | l 10'04               | l 8'86   | h 8'20   | l 9'74   | l 9'60   | h 7'48   | l 6'18   | l 6'42   |                                                                                                 |                                                                                                 |
|                                                                                                                 |                       |          | l 9'78   |          |          | h 9'34   | l 9'10   |          |                                                                                                 |                                                                                                 |
|                                                                                                                 | 9'29                  | 8'05     | 8'95     | 8'92     | 8'82     | 9'00     | 7'38     | 7'45     |                                                                                                 |                                                                                                 |

NOTE.—(III) and (IV) appertain to base-line figures.

## OBSERVED ANGLES.

23—B.

| At I                                                                                                                  |                                                                          |                                                       |                                                                          |                                                       |                                                       |                                                       |                                                       |                                                                          |                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| January and February 1849, observed by Captains T. Renny and A. Strange with Troughton and Simms' 36-inch Theodolite. |                                                                          |                                                       |                                                                          |                                                       |                                                       |                                                       |                                                       |                                                                          |                                                                                           |
| Angle between                                                                                                         | Circle readings, telescope being set on R M                              |                                                       |                                                                          |                                                       |                                                       |                                                       |                                                       |                                                                          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                                       | 0° 1'                                                                    | 180° 1'                                               | 9° 17'                                                                   | 189° 17'                                              | 18° 33'                                               | 198° 33'                                              | 27° 50'                                               | 207° 50'                                                                 |                                                                                           |
| R M & (III)                                                                                                           | "                                                                        | "                                                     | "                                                                        | "                                                     | "                                                     | "                                                     | "                                                     | "                                                                        | <i>M</i> = 29° 88<br><i>w</i> = 4 19<br>$\frac{1}{w}$ = 0 24<br><i>C</i> = 39° 5' 29° 88  |
|                                                                                                                       | <i>h</i> 29° 10<br><i>l</i> 31° 80<br><i>d</i> 29° 53<br><i>h</i> 30° 68 | <i>h</i> 27° 32<br><i>h</i> 26° 54<br><i>h</i> 28° 52 | <i>l</i> 28° 94<br><i>l</i> 28° 68<br><i>l</i> 28° 66<br><i>l</i> 29° 48 | <i>h</i> 28° 76<br><i>l</i> 31° 52<br><i>l</i> 28° 98 | <i>l</i> 30° 42<br><i>l</i> 30° 46<br><i>l</i> 31° 52 | <i>l</i> 30° 26<br><i>l</i> 29° 70<br><i>l</i> 28° 08 | <i>l</i> 30° 78<br><i>l</i> 31° 14<br><i>l</i> 30° 62 | <i>d</i> 31° 51<br><i>l</i> 32° 44<br><i>l</i> 31° 24<br><i>l</i> 31° 24 |                                                                                           |
| (III) & (IV)                                                                                                          | <i>h</i> 49° 76<br><i>l</i> 45° 44<br><i>d</i> 47° 79<br><i>h</i> 51° 18 | <i>h</i> 52° 40<br><i>h</i> 52° 26<br><i>h</i> 50° 10 | <i>l</i> 48° 76<br><i>l</i> 48° 68<br><i>l</i> 48° 96                    | <i>d</i> 48° 53<br><i>l</i> 48° 06<br><i>l</i> 48° 74 | <i>l</i> 47° 16<br><i>l</i> 46° 66<br><i>l</i> 47° 82 | <i>l</i> 49° 42<br><i>l</i> 47° 90<br><i>l</i> 50° 70 | <i>l</i> 48° 28<br><i>l</i> 48° 26<br><i>l</i> 48° 08 | <i>d</i> 47° 98<br><i>l</i> 49° 10<br><i>l</i> 46° 78<br><i>l</i> 48° 44 | <i>M</i> = 48° 78<br><i>w</i> = 3 90<br>$\frac{1}{w}$ = 0 26<br><i>C</i> = 85° 17' 48° 77 |
|                                                                                                                       | 48° 54                                                                   | 51° 59                                                | 48° 80                                                                   | 48° 44                                                | 47° 21                                                | 49° 34                                                | 48° 21                                                | 48° 08                                                                   |                                                                                           |
| (IV) & II                                                                                                             | <i>l</i> 35° 34<br><i>l</i> 34° 58<br><i>h</i> 34° 10                    | <i>h</i> 32° 52<br><i>d</i> 33° 59<br><i>d</i> 33° 67 | <i>l</i> 35° 26<br><i>l</i> 35° 48<br><i>l</i> 35° 34                    | <i>l</i> 35° 74<br><i>d</i> 33° 51<br><i>d</i> 34° 05 | <i>l</i> 37° 22<br><i>l</i> 38° 10<br><i>l</i> 35° 30 | <i>l</i> 34° 66<br><i>l</i> 38° 12<br><i>l</i> 35° 30 | <i>l</i> 34° 96<br><i>l</i> 35° 30<br><i>l</i> 35° 74 | <i>l</i> 34° 24<br><i>l</i> 36° 98<br><i>l</i> 35° 06                    | <i>M</i> = 35° 17<br><i>w</i> = 5 52<br>$\frac{1}{w}$ = 0 18<br><i>C</i> = 93° 21' 35° 17 |
|                                                                                                                       | 34° 67                                                                   | 33° 26                                                | 35° 36                                                                   | 34° 43                                                | 36° 87                                                | 36° 03                                                | 35° 33                                                | 35° 43                                                                   |                                                                                           |
| II & III                                                                                                              | <i>l</i> 48° 64<br><i>l</i> 47° 60<br><i>d</i> 44° 93                    | <i>d</i> 46° 49<br><i>d</i> 46° 61<br><i>d</i> 47° 03 | <i>l</i> 46° 84<br><i>l</i> 46° 52<br><i>l</i> 45° 52                    | <i>l</i> 45° 12<br><i>d</i> 46° 41<br><i>d</i> 46° 55 | <i>l</i> 43° 38<br><i>l</i> 45° 70<br><i>l</i> 46° 34 | <i>l</i> 46° 74<br><i>l</i> 44° 54<br><i>l</i> 45° 92 | <i>l</i> 47° 12<br><i>l</i> 48° 10<br><i>l</i> 46° 64 | <i>l</i> 48° 32<br><i>d</i> 47° 02<br><i>d</i> 47° 56<br><i>l</i> 48° 42 | <i>M</i> = 46° 52<br><i>w</i> = 7 67<br>$\frac{1}{w}$ = 0 13<br><i>C</i> = 51° 25' 46° 53 |
|                                                                                                                       | 47° 06                                                                   | 46° 71                                                | 46° 29                                                                   | 46° 03                                                | 45° 14                                                | 45° 77                                                | 47° 29                                                | 47° 86                                                                   |                                                                                           |

NOTE.—(III) and (IV) appertain to base-line figures.

| At I—(Continued.)                                                                                                                         |                                             |                 |                 |                 |                 |                 |                 |                 |                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------------------------------------------------------------------------------|
| <i>January and February 1849, observed by Captains T. Renny and A. Strange with Troughton and Simms' 36-inch Theodolite.</i>              |                                             |                 |                 |                 |                 |                 |                 |                 |                                                                                            |
| Angle between                                                                                                                             | Circle readings, telescope being set on IV  |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                                           | 327° 37'                                    | 147° 37'        | 336° 54'        | 156° 53'        | 346° 10'        | 166° 10'        | 355° 26'        | 175° 25'        |                                                                                            |
| IV & R M                                                                                                                                  | "                                           | "               | "               | "               | "               | "               | "               | "               |                                                                                            |
|                                                                                                                                           | <i>h</i> 47° 92                             | <i>h</i> 46° 54 | <i>h</i> 48° 86 | <i>h</i> 46° 00 | <i>h</i> 46° 12 | <i>h</i> 46° 66 | <i>h</i> 45° 46 | <i>h</i> 46° 04 | <i>M</i> = 46° 78<br><i>w</i> = 12 07<br>$\frac{1}{w}$ = 0 08<br><i>C</i> = 32° 23' 46" 77 |
|                                                                                                                                           | <i>h</i> 46° 68                             | <i>h</i> 45° 28 | <i>h</i> 47° 58 | <i>h</i> 44° 72 | <i>h</i> 46° 42 | <i>h</i> 47° 74 | <i>h</i> 46° 08 | <i>h</i> 45° 94 |                                                                                            |
| <i>h</i> 47° 38                                                                                                                           | <i>h</i> 47° 68                             | <i>h</i> 47° 80 | <i>h</i> 46° 72 | <i>h</i> 47° 38 | <i>h</i> 47° 18 | <i>h</i> 45° 80 | <i>h</i> 47° 28 |                 |                                                                                            |
|                                                                                                                                           |                                             |                 | <i>h</i> 47° 12 | <i>h</i> 46° 96 |                 |                 |                 |                 |                                                                                            |
|                                                                                                                                           | 47° 33                                      | 46° 50          | 48° 08          | 46° 30          | 46° 64          | 47° 19          | 45° 78          | 46° 42          |                                                                                            |
| At II                                                                                                                                     |                                             |                 |                 |                 |                 |                 |                 |                 |                                                                                            |
| <i>February 1849, observed by Captains T. Renny and A. Strange and Lieutenant H. Rivers with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                 |                 |                 |                 |                 |                 |                 |                                                                                            |
| Angle between                                                                                                                             | Circle readings, telescope being set on III |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                                           | 0° 0'                                       | 180° 0'         | 9° 17'          | 189° 17'        | 18° 33'         | 198° 33'        | 27° 49'         | 207° 49'        |                                                                                            |
| III & I                                                                                                                                   | "                                           | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 36° 54<br><i>w</i> = 15 12<br>$\frac{1}{w}$ = 0 07<br><i>C</i> = 71° 31' 36" 54 |
|                                                                                                                                           | <i>l</i> 35° 96                             | <i>l</i> 36° 30 | <i>l</i> 36° 40 | <i>l</i> 36° 50 | <i>l</i> 37° 98 | <i>l</i> 38° 02 | <i>l</i> 35° 80 | <i>l</i> 34° 62 |                                                                                            |
|                                                                                                                                           | <i>l</i> 37° 30                             | <i>l</i> 35° 80 | <i>l</i> 36° 78 | <i>l</i> 36° 24 | <i>l</i> 37° 30 | <i>l</i> 37° 24 | <i>l</i> 36° 82 | <i>l</i> 36° 70 |                                                                                            |
|                                                                                                                                           | <i>l</i> 36° 96                             | <i>l</i> 36° 60 | <i>l</i> 35° 52 | <i>l</i> 35° 22 | <i>l</i> 37° 32 | <i>l</i> 37° 02 | <i>l</i> 36° 78 | <i>l</i> 35° 80 |                                                                                            |
|                                                                                                                                           | 36° 74                                      | 36° 23          | 36° 23          | 35° 99          | 37° 53          | 37° 43          | 36° 47          | 35° 71          |                                                                                            |
| I & (IV)                                                                                                                                  | <i>l</i> 34° 32                             | <i>l</i> 31° 66 | <i>l</i> 33° 26 | <i>l</i> 29° 70 | <i>l</i> 32° 86 | <i>l</i> 30° 96 | <i>l</i> 33° 28 | <i>h</i> 33° 16 | <i>M</i> = 32° 05<br><i>w</i> = 6 26<br>$\frac{1}{w}$ = 0 16<br><i>C</i> = 41° 33' 32" 05  |
|                                                                                                                                           | <i>l</i> 33° 52                             | <i>l</i> 30° 90 | <i>l</i> 33° 20 | <i>l</i> 30° 18 | <i>l</i> 32° 30 | <i>l</i> 30° 58 | <i>h</i> 32° 26 | <i>h</i> 32° 82 |                                                                                            |
|                                                                                                                                           | <i>l</i> 32° 08                             | <i>l</i> 31° 58 | <i>l</i> 32° 50 | <i>l</i> 31° 06 | <i>l</i> 32° 18 | <i>l</i> 31° 08 | <i>h</i> 30° 82 | <i>h</i> 32° 66 |                                                                                            |
|                                                                                                                                           |                                             |                 |                 |                 |                 | <i>h</i> 32° 30 |                 |                 |                                                                                            |
|                                                                                                                                           | 33° 31                                      | 31° 38          | 32° 99          | 30° 31          | 32° 45          | 30° 87          | 32° 17          | 32° 88          |                                                                                            |

NOTE.—(III) and (IV) appertain to base-line figures.

## OBSERVED ANGLES.

25—B.

| At III                                                                                                                                                           |                                            |                                          |                                          |                               |                                          |                                          |                               |                               |                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|-------------------------------|------------------------------------------|------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------------------------------------------------------|
| <i>February and March 1849, observed by Captains T. Renny and A. Strange, Lieutenant H. Rivers and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                            |                                          |                                          |                               |                                          |                                          |                               |                               |                                                                                                |
| Angle between                                                                                                                                                    | Circle readings, telescope being set on VI |                                          |                                          |                               |                                          |                                          |                               |                               | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle          |
|                                                                                                                                                                  | 0° 2'                                      | 180° 2'                                  | 9° 17'                                   | 189° 17'                      | 18° 33'                                  | 198° 33'                                 | 27° 49'                       | 207° 49'                      |                                                                                                |
| VI & V                                                                                                                                                           | "                                          | "                                        | "                                        | "                             | "                                        | "                                        | "                             | "                             | <i>M</i> = 39''96<br><br><i>w</i> = 10.40<br>$\frac{1}{w}$ = 0.10<br><i>C</i> = 81° 12' 39''95 |
|                                                                                                                                                                  | l 41'38<br>l 41'22<br>l 41'10              | l 39'84<br>l 39'76<br>l 40'52            | l 39'78<br>l 38'96<br>l 40'00<br>l 38'82 | l 41'62<br>l 38'92<br>l 40'78 | h 40'34<br>h 40'54<br>l 41'00<br>l 40'12 | l 39'48<br>l 36'98<br>l 38'50<br>l 40'00 | l 39'90<br>l 38'32<br>l 40'12 | l 38'90<br>l 40'08<br>l 40'76 |                                                                                                |
|                                                                                                                                                                  | 41'23                                      | 40'04                                    | 39'39                                    | 40'44                         | 40'50                                    | 38'74                                    | 39'45                         | 39'91                         |                                                                                                |
| V & IV                                                                                                                                                           | l 53'72<br>l 54'40<br>l 53'94              | l 53'80<br>h 52'94<br>h 53'06<br>l 52'64 | l 55'60<br>l 53'92<br>l 53'64            | l 52'86<br>h 53'44<br>h 52'92 | h 51'88<br>h 53'16<br>h 53'50            | l 55'58<br>l 54'60<br>l 54'76<br>l 52'90 | l 55'06<br>l 54'32<br>l 52'90 | h 53'40<br>h 52'38<br>h 53'28 | <i>M</i> = 53''63<br><br><i>w</i> = 13.10<br>$\frac{1}{w}$ = 0.08<br><i>C</i> = 50° 53' 53''63 |
|                                                                                                                                                                  |                                            | 54'02                                    | 53'11                                    | 54'39                         | 53'07                                    | 52'85                                    | 54'46                         | 54'09                         |                                                                                                |
| IV & I                                                                                                                                                           | l 11'16<br>l 9'70<br>l 10'06               | l 12'72<br>l 13'92<br>l 12'30            | l 10'92<br>l 11'58<br>l 14'72<br>l 12'84 | l 13'24<br>l 12'16<br>l 10'62 | l 12'00<br>l 12'84<br>l 11'52            | l 12'04<br>l 14'24<br>l 12'68            | l 10'18<br>l 10'74<br>l 11'48 | l 12'04<br>l 12'52<br>h 11'96 | <i>M</i> = 11''99<br><br><i>w</i> = 6.69<br>$\frac{1}{w}$ = 0.15<br><i>C</i> = 60° 25' 11''99  |
|                                                                                                                                                                  |                                            | 10'31                                    | 12'98                                    | 12'52                         | 12'01                                    | 12'12                                    | 12'99                         | 10'80                         |                                                                                                |
| I & II                                                                                                                                                           | l 39'56<br>l 40'44<br>l 40'48              | l 38'40<br>l 38'12<br>l 38'14            | l 37'24<br>l 36'76<br>l 37'28<br>l 36'40 | l 39'56<br>l 40'44<br>l 38'48 | l 39'60<br>l 38'84<br>l 38'82            | l 37'32<br>l 38'20<br>l 38'98            | l 40'56<br>l 39'30<br>l 38'64 | l 37'92<br>l 39'32<br>l 38'30 | <i>M</i> = 38''76<br><br><i>w</i> = 7.06<br>$\frac{1}{w}$ = 0.14<br><i>C</i> = 57° 2' 38''75   |
|                                                                                                                                                                  |                                            | 40'16                                    | 38'22                                    | 36'92                         | 39'49                                    | 39'09                                    | 38'17                         | 39'50                         |                                                                                                |

## KARACHI LONGITUDINAL SERIES.

| At IV                                                                                                                                               |                                               |         |         |          |         |          |         |          |                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------|---------|----------|---------|----------|---------|----------|----------------------------------------------------------------------------------------------------|
| <i>March 1849, observed by Captains T. Renny and A. Strange, Mr. C. Lane and Lieutenant H. Rivers with Troughton and Simms' 36-inch Theodolite.</i> |                                               |         |         |          |         |          |         |          |                                                                                                    |
| Angle between                                                                                                                                       | Circle readings, telescope being set on (III) |         |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle              |
|                                                                                                                                                     | 0° 2'                                         | 180° 2' | 9° 18'  | 189° 18' | 18° 34' | 198° 34' | 27° 48' | 207° 48' |                                                                                                    |
| (III) & I                                                                                                                                           | "                                             | "       | "       | "        | "       | "        | "       | "        | <i>M</i> = 21''·74<br><br><i>w</i> = 22 ·32<br>$\frac{1}{w}$ = 0 ·04<br><i>C</i> = 44° 52' 21''·74 |
|                                                                                                                                                     | h 21'86                                       | l 20'04 | l 20'80 | l 21'04  | l 22'26 | l 22'16  | l 22'26 | l 23'16  |                                                                                                    |
|                                                                                                                                                     | h 21'08                                       | l 20'42 | l 22'56 | l 21'96  | l 22'68 | l 22'14  | l 22'30 | l 22'08  |                                                                                                    |
|                                                                                                                                                     | h 21'22                                       | l 21'00 | l 21'14 | l 20'50  | l 22'46 | l 22'44  | l 21'72 | l 22'36  |                                                                                                    |
|                                                                                                                                                     |                                               |         |         |          |         |          |         | l 22'50  |                                                                                                    |
|                                                                                                                                                     | 21'39                                         | 20'49   | 21'50   | 21'17    | 22'47   | 22'25    | 22'09   | 22'53    |                                                                                                    |
| I & III                                                                                                                                             | h 18'70                                       | l 17'88 | l 17'98 | l 18'36  | l 16'92 | l 16'62  | l 16'32 | l 17'44  | <i>M</i> = 17''·55<br><br><i>w</i> = 9 ·48<br>$\frac{1}{w}$ = 0 ·11<br><i>C</i> = 61° 9' 17''·55   |
|                                                                                                                                                     | h 19'92                                       | l 18'10 | l 17'42 | l 17'50  | l 18'32 | l 16'48  | l 16'04 | l 16'74  |                                                                                                    |
|                                                                                                                                                     | h 18'90                                       | l 17'24 | l 17'86 | l 17'18  | l 19'20 | l 16'16  | l 16'82 | l 16'88  |                                                                                                    |
|                                                                                                                                                     |                                               |         |         |          | l 17'48 | l 17'42  |         |          |                                                                                                    |
|                                                                                                                                                     | 19'17                                         | 17'74   | 17'75   | 17'68    | 17'98   | 16'67    | 16'39   | 17'02    |                                                                                                    |
| III & V                                                                                                                                             | h 48'92                                       | l 50'24 | l 49'62 | l 47'76  | l 49'70 | l 50'02  | l 50'88 | l 50'64  | <i>M</i> = 49''·90<br><br><i>w</i> = 12 ·06<br>$\frac{1}{w}$ = 0 ·08<br><i>C</i> = 42° 59' 49''·90 |
|                                                                                                                                                     | h 47'92                                       | l 49'98 | l 49'38 | l 48'98  | l 49'64 | l 50'78  | l 51'16 | l 50'92  |                                                                                                    |
|                                                                                                                                                     | h 49'26                                       | l 49'72 | l 50'32 | l 50'68  | l 49'24 | l 51'00  | l 49'48 | l 51'34  |                                                                                                    |
|                                                                                                                                                     |                                               |         |         | l 49'58  |         | l 49'98  |         |          |                                                                                                    |
|                                                                                                                                                     | 48'70                                         | 49'98   | 49'77   | 49'25    | 49'53   | 50'45    | 50'51   | 50'97    |                                                                                                    |
| V & VII                                                                                                                                             | h 57'18                                       | l 58'36 | l 59'56 | l 60'22  | l 59'80 | l 59'64  | l 59'28 | l 57'36  | <i>M</i> = 58''·97<br><br><i>w</i> = 12 ·82<br>$\frac{1}{w}$ = 0 ·08<br><i>C</i> = 66° 9' 58''·97  |
|                                                                                                                                                     | h 57'88                                       | l 58'56 | l 58'60 | l 60'72  | l 58'30 | l 59'20  | l 59'96 | l 58'84  |                                                                                                    |
|                                                                                                                                                     | h 58'22                                       | l 59'36 | l 58'60 | l 58'00  | l 58'20 | l 59'58  | l 60'84 | l 59'62  |                                                                                                    |
|                                                                                                                                                     |                                               |         |         | l 58'66  |         |          |         |          |                                                                                                    |
|                                                                                                                                                     | 57'76                                         | 58'76   | 58'92   | 59'40    | 58'77   | 59'47    | 60'03   | 58'61    |                                                                                                    |

NOTE.—(III) appertains to base-line figures.



## OBSERVED ANGLES.

27—3.

At V

March 1849, observed by Captains T. Renny and A. Strange and Lieutenant H. Rivers with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on R M |          |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle            |
|---------------|---------------------------------------------|----------|---------|----------|---------|----------|---------|----------|--------------------------------------------------------------------------------------------------|
|               | 259° 56'                                    | 179° 56' | 9° 18'  | 189° 18' | 18° 34' | 198° 34' | 27° 52' | 207° 52' |                                                                                                  |
| R M & VII     | h 24'48                                     | l 23'86  | l 22'04 | l 22'90  | l 22'38 | l 22'22  | l 22'08 | l 24'46  | <i>M</i> = 23''07<br><br><i>w</i> = 10 '22<br>$\frac{1}{w}$ = 0 '10<br><i>C</i> = 0° 21' 23''08  |
|               | l 22'46                                     | l 22'80  | l 21'32 | l 23'56  | l 25'32 | l 22'60  | l 22'68 | l 23'78  |                                                                                                  |
|               | l 23'38                                     | l 21'98  | l 22'04 | l 22'50  | l 25'54 | h 23'18  | l 23'14 | l 23'18  |                                                                                                  |
|               | 23'44                                       | 22'88    | 21'80   | 22'99    | 24'31   | 22'67    | 22'63   | 23'81    |                                                                                                  |
| VII & IV      | h 18'58                                     | l 17'82  | l 20'58 | l 20'46  | l 21'46 | h 19'44  | l 20'48 | l 18'86  | <i>M</i> = 19''70<br><br><i>w</i> = 12 '61<br>$\frac{1}{w}$ = 0 '08<br><i>C</i> = 77° 9' 19''69  |
|               | l 19'16                                     | l 19'34  | l 18'80 | l 18'32  | l 18'70 | h 20'56  | l 21'12 | l 20'70  |                                                                                                  |
|               | l 19'56                                     | l 19'54  | l 19'72 | l 18'88  | l 18'12 | h 20'50  | l 20'72 | l 21'26  |                                                                                                  |
|               |                                             | l 19'10  |         |          |         |          |         |          |                                                                                                  |
|               | 19'10                                       | 18'95    | 19'70   | 19'22    | 19'43   | 20'17    | 20'77   | 20'27    |                                                                                                  |
| IV & III      | h 16'24                                     | l 16'30  | l 15'62 | l 18'02  | l 17'20 | h 17'20  | l 15'58 | l 17'38  | <i>M</i> = 16''89<br><br><i>w</i> = 17 '24<br>$\frac{1}{w}$ = 0 '06<br><i>C</i> = 86° 6' 16''88  |
|               | h 16'18                                     | l 17'26  | l 18'32 | l 16'84  | l 17'14 | h 16'80  | l 16'56 | l 15'86  |                                                                                                  |
|               | l 17'48                                     | l 15'24  | l 17'34 | l 19'26  | l 16'14 | h 15'98  | l 18'18 | l 16'26  |                                                                                                  |
|               | l 16'78                                     | l 17'38  |         |          |         |          |         |          |                                                                                                  |
|               | 16'67                                       | 16'55    | 17'09   | 18'04    | 16'83   | 16'66    | 16'77   | 16'50    |                                                                                                  |
| III & VI      | h 50'76                                     | l 49'30  | l 52'02 | l 47'56  | l 48'88 | l 48'28  | l 51'00 | l 50'18  | <i>M</i> = 49''97<br><br><i>w</i> = 14 '45<br>$\frac{1}{w}$ = 0 '07<br><i>C</i> = 57° 57' 49''96 |
|               | h 49'24                                     | l 50'50  | l 50'10 | l 49'86  | l 49'50 | l 49'12  | l 50'62 | l 50'26  |                                                                                                  |
|               | l 50'26                                     | l 50'22  | l 51'12 | l 49'78  | l 50'36 | h 49'76  | l 49'28 | l 50'32  |                                                                                                  |
|               |                                             |          |         |          | h 50'36 |          |         |          |                                                                                                  |
|               | 50'09                                       | 50'01    | 51'08   | 49'07    | 49'58   | 49'38    | 50'30   | 50'25    |                                                                                                  |

| <i>At V—(Continued.)</i>                                                                                                               |                                             |                |                |                |                |                |                |                |                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------------------------------------------------------------------------------|
| <i>March 1849, observed by Captains T. Renny and A. Strange and Lieutenant H. Rivers with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                                                                                              |
| Angle between                                                                                                                          | Circle readings, telescope being set on R M |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                                        | 359° 56'                                    | 179° 56'       | 9° 18'         | 189° 18'       | 18° 34'        | 198° 34'       | 27° 52'        | 207° 52'       |                                                                                              |
| VI & VIII                                                                                                                              | "                                           | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 13".35<br><i>w</i> = 16 .22<br>$\frac{1}{w}$ = 0 .06<br><i>C</i> = 79° 49' 13".36 |
|                                                                                                                                        | <i>h</i> 12.74                              | <i>l</i> 14.98 | <i>l</i> 12.80 | <i>l</i> 14.60 | <i>l</i> 13.46 | <i>l</i> 12.40 | <i>l</i> 13.50 | <i>l</i> 12.80 |                                                                                              |
|                                                                                                                                        | <i>h</i> 14.92                              | <i>l</i> 12.54 | <i>l</i> 13.48 | <i>l</i> 14.60 | <i>l</i> 13.38 | <i>l</i> 13.44 | <i>l</i> 13.30 | <i>l</i> 11.98 |                                                                                              |
|                                                                                                                                        | <i>l</i> 15.32                              | <i>l</i> 13.66 | <i>l</i> 12.14 | <i>l</i> 12.52 | <i>l</i> 13.94 | <i>l</i> 13.22 | <i>l</i> 12.30 | <i>l</i> 13.06 |                                                                                              |
|                                                                                                                                        | 14.13                                       | 13.73          | 12.81          | 13.91          | 13.59          | 13.02          | 13.03          | 12.61          |                                                                                              |
| VIII & VII                                                                                                                             | <i>h</i> 21.68                              | <i>l</i> 21.60 | <i>l</i> 18.98 | <i>l</i> 19.36 | <i>l</i> 19.00 | <i>l</i> 21.16 | <i>l</i> 19.44 | <i>l</i> 20.78 | <i>M</i> = 20".04<br><i>w</i> = 13 .51<br>$\frac{1}{w}$ = 0 .07<br><i>C</i> = 58° 57' 20".05 |
|                                                                                                                                        | <i>l</i> 18.48                              | <i>l</i> 20.36 | <i>l</i> 19.30 | <i>l</i> 20.38 | <i>l</i> 21.28 | <i>l</i> 19.14 | <i>l</i> 18.40 | <i>l</i> 20.18 |                                                                                              |
|                                                                                                                                        | <i>l</i> 19.88                              | <i>l</i> 21.34 | <i>l</i> 19.68 | <i>l</i> 19.56 | <i>l</i> 21.44 | <i>h</i> 21.08 | <i>l</i> 19.52 | <i>l</i> 19.46 |                                                                                              |
|                                                                                                                                        |                                             | <i>l</i> 20.48 |                |                |                |                |                |                |                                                                                              |
|                                                                                                                                        | 20.01                                       | 20.95          | 19.32          | 19.77          | 20.57          | 20.46          | 19.12          | 20.14          |                                                                                              |
| <i>At VI</i>                                                                                                                           |                                             |                |                |                |                |                |                |                |                                                                                              |
| <i>March 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i>          |                                             |                |                |                |                |                |                |                |                                                                                              |
| Angle between                                                                                                                          | Circle readings, telescope being set on X   |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                                        | 163° 19'                                    | 343° 19'       | 172° 35'       | 352° 35'       | 181° 52'       | 1° 52'         | 191° 7'        | 11° 7'         |                                                                                              |
| X & IX                                                                                                                                 | "                                           | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 37".19<br><i>w</i> = 24 .30<br>$\frac{1}{w}$ = 0 .04<br><i>C</i> = 49° 30' 37".19 |
|                                                                                                                                        | <i>h</i> 37.28                              | <i>h</i> 36.86 | <i>l</i> 37.80 | <i>l</i> 37.12 | <i>h</i> 37.58 | <i>l</i> 37.12 | <i>l</i> 35.06 | <i>l</i> 37.48 |                                                                                              |
|                                                                                                                                        | <i>h</i> 38.46                              | <i>h</i> 35.98 | <i>l</i> 37.34 | <i>l</i> 37.42 | <i>l</i> 37.12 | <i>l</i> 35.64 | <i>l</i> 37.58 | <i>l</i> 36.54 |                                                                                              |
|                                                                                                                                        | <i>h</i> 37.08                              | <i>h</i> 36.96 | <i>l</i> 37.40 | <i>l</i> 36.48 | <i>l</i> 38.70 | <i>l</i> 37.04 | <i>l</i> 37.66 | <i>l</i> 37.76 |                                                                                              |
|                                                                                                                                        | <i>h</i> 37.86                              | <i>h</i> 37.70 |                |                |                |                |                |                |                                                                                              |
|                                                                                                                                        | 37.67                                       | 36.88          | 37.51          | 37.01          | 37.80          | 36.60          | 36.77          | 37.26          |                                                                                              |

## OBSERVED ANGLES.

29—B.

| At VI—(Continued.)                                                                                                            |                                            |                |                |                |                |                |                |                |                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------------------------------------------------------------------------------------|
| <i>March 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                            |                |                |                |                |                |                |                |                                                                                                |
| Angle between                                                                                                                 | Circle readings, telescope being set on X  |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle          |
|                                                                                                                               | 163° 19'                                   | 343° 19'       | 172° 35'       | 352° 35'       | 181° 52'       | 1° 52'         | 191° 7'        | 11° 7'         |                                                                                                |
| IX & VIII                                                                                                                     | "                                          | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 34''·24<br><i>w</i> = 12 ·16<br>$\frac{1}{w}$ = 0 ·08<br><i>C</i> = 49° 29' 34''·24 |
|                                                                                                                               | <i>l</i> 35'86                             | <i>l</i> 33'10 | <i>l</i> 33'40 | <i>l</i> 34'42 | <i>h</i> 33'46 | <i>l</i> 36'28 | <i>l</i> 34'06 | <i>l</i> 35'00 |                                                                                                |
|                                                                                                                               | <i>l</i> 34'96                             | <i>l</i> 33'92 | <i>l</i> 33'32 | <i>l</i> 32'50 | <i>l</i> 33'80 | <i>l</i> 34'76 | <i>l</i> 33'80 | <i>l</i> 32'38 |                                                                                                |
|                                                                                                                               | <i>l</i> 34'84                             | <i>l</i> 35'92 | <i>l</i> 33'50 | <i>l</i> 35'00 | <i>l</i> 33'74 | <i>l</i> 34'78 | <i>l</i> 34'62 | <i>l</i> 34'24 |                                                                                                |
|                                                                                                                               | 35'22                                      | 34'31          | 33'41          | 33'97          | 33'67          | 35'27          | 34'16          | 33'87          |                                                                                                |
| VIII & V                                                                                                                      | <i>l</i> 17'46                             | <i>l</i> 16'76 | <i>l</i> 14'44 | <i>h</i> 16'22 | <i>l</i> 15'66 | <i>l</i> 17'20 | <i>h</i> 15'52 | <i>h</i> 14'86 | <i>M</i> = 16''·12<br><i>w</i> = 14 ·87<br>$\frac{1}{w}$ = 0 ·07<br><i>C</i> = 56° 52' 16''·12 |
|                                                                                                                               | <i>l</i> 15'86                             | <i>l</i> 16'58 | <i>l</i> 16'90 | <i>l</i> 16'02 | <i>l</i> 15'50 | <i>h</i> 16'84 | <i>h</i> 15'68 | <i>h</i> 14'86 |                                                                                                |
|                                                                                                                               | <i>l</i> 17'12                             | <i>l</i> 16'62 | <i>l</i> 16'72 | <i>l</i> 16'82 | <i>l</i> 15'54 | <i>h</i> 16'16 | <i>h</i> 15'24 | <i>h</i> 15'44 |                                                                                                |
|                                                                                                                               |                                            |                | <i>l</i> 17'24 |                |                |                |                |                |                                                                                                |
|                                                                                                                               | 16'81                                      | 16'65          | 16'33          | 16'35          | 15'57          | 16'73          | 15'48          | 15'05          |                                                                                                |
| V & III                                                                                                                       | <i>l</i> 28'96                             | <i>l</i> 31'12 | <i>l</i> 30'24 | <i>h</i> 30'10 | <i>l</i> 30'74 | <i>l</i> 29'38 | <i>h</i> 30'92 | <i>h</i> 29'62 | <i>M</i> = 30''·06<br><i>w</i> = 7 ·84<br>$\frac{1}{w}$ = 0 ·13<br><i>C</i> = 40° 49' 30''·06  |
|                                                                                                                               | <i>l</i> 27'80                             | <i>l</i> 29'96 | <i>l</i> 31'30 | <i>l</i> 30'84 | <i>l</i> 30'02 | <i>h</i> 30'04 | <i>h</i> 30'46 | <i>h</i> 29'60 |                                                                                                |
|                                                                                                                               | <i>l</i> 26'96                             | <i>l</i> 30'50 | <i>l</i> 31'74 | <i>l</i> 30'70 | <i>l</i> 30'58 | <i>h</i> 30'00 | <i>h</i> 30'02 | <i>h</i> 29'86 |                                                                                                |
|                                                                                                                               | 27'91                                      | 30'53          | 31'09          | 30'55          | 30'45          | 29'81          | 30'47          | 29'69          |                                                                                                |
| At VII                                                                                                                        |                                            |                |                |                |                |                |                |                |                                                                                                |
| <i>March 1849, observed by Captains T. Renny and A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                 |                                            |                |                |                |                |                |                |                |                                                                                                |
| Angle between                                                                                                                 | Circle readings, telescope being set on IV |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle          |
|                                                                                                                               | 0° 2'                                      | 180° 2'        | 9° 17'         | 189° 17'       | 18° 33'        | 198° 33'       | 27° 50'        | 207° 50'       |                                                                                                |
| IV & V                                                                                                                        | "                                          | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 43''·18<br><i>w</i> = 10 ·56<br>$\frac{1}{w}$ = 0 ·09<br><i>C</i> = 36° 40' 43''·18 |
|                                                                                                                               | <i>l</i> 44'14                             | <i>l</i> 42'38 | <i>l</i> 40'02 | <i>h</i> 43'28 | <i>l</i> 44'60 | <i>l</i> 44'16 | <i>l</i> 42'60 | <i>l</i> 43'78 |                                                                                                |
|                                                                                                                               | <i>l</i> 43'68                             | <i>l</i> 41'82 | <i>l</i> 43'06 | <i>h</i> 42'38 | <i>l</i> 42'94 | <i>l</i> 42'70 | <i>l</i> 43'94 | <i>l</i> 44'50 |                                                                                                |
|                                                                                                                               | <i>l</i> 44'22                             | <i>l</i> 42'32 | <i>h</i> 43'52 | <i>h</i> 42'82 | <i>l</i> 44'14 | <i>l</i> 42'04 | <i>l</i> 44'10 | <i>l</i> 43'20 |                                                                                                |
|                                                                                                                               | 44'01                                      | 42'17          | 42'20          | 42'83          | 43'89          | 42'97          | 43'55          | 43'83          |                                                                                                |

| At VII—(Continued.)                                                                                                                     |                                             |                |                |                |                |                |                |                |                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------------------------------------------------------------------------------|
| <i>March 1849, observed by Captains T. Renny and A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                           |                                             |                |                |                |                |                |                |                |                                                                                                  |
| Angle between                                                                                                                           | Circle readings, telescope being set on IV  |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle            |
|                                                                                                                                         | 0° 2'                                       | 180° 2'        | 9° 17'         | 189° 17'       | 18° 33'        | 198° 33'       | 27° 50'        | 207° 50'       |                                                                                                  |
| V & VIII                                                                                                                                | "                                           | "              | "              | "              | "              | "              | "              | "              | "                                                                                                |
|                                                                                                                                         | <i>l</i> 46°80                              | <i>l</i> 45°74 | <i>l</i> 48°06 | <i>h</i> 44°94 | <i>l</i> 45°40 | <i>l</i> 47°24 | <i>l</i> 48°12 | <i>l</i> 47°24 | <i>M</i> = 46''·70<br><br><i>w</i> = 13·83<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 63° 25' 46''·70 |
|                                                                                                                                         | <i>l</i> 46°20                              | <i>l</i> 46°46 | <i>l</i> 46°84 | <i>h</i> 45°86 | <i>l</i> 45°74 | <i>l</i> 47°14 | <i>l</i> 46°44 | <i>l</i> 46°98 |                                                                                                  |
| <i>l</i> 46°68                                                                                                                          | <i>l</i> 46°82                              | <i>h</i> 47°52 | <i>h</i> 46°24 | <i>l</i> 46°40 | <i>l</i> 46°94 | <i>l</i> 48°14 | <i>l</i> 46°76 |                |                                                                                                  |
|                                                                                                                                         |                                             | <i>h</i> 47°54 |                |                |                |                |                |                |                                                                                                  |
|                                                                                                                                         | 46°56                                       | 46°34          | 47°49          | 45°68          | 45°85          | 47°11          | 47°57          | 46°99          |                                                                                                  |
| At VIII                                                                                                                                 |                                             |                |                |                |                |                |                |                |                                                                                                  |
| <i>March and April 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                                                                                                  |
| Angle between                                                                                                                           | Circle readings, telescope being set on VII |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle            |
|                                                                                                                                         | 0° 1'                                       | 180° 1'        | 9° 17'         | 189° 17'       | 18° 33'        | 198° 33'       | 27° 49'        | 207° 48'       |                                                                                                  |
| VII & V                                                                                                                                 | "                                           | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 55''·29<br><br><i>w</i> = 36·85<br>$\frac{1}{w}$ = 0·03<br><i>C</i> = 57° 36' 55''·30 |
|                                                                                                                                         | <i>l</i> 55°42                              | <i>l</i> 55°20 | <i>l</i> 55°88 | <i>l</i> 54°76 | <i>l</i> 54°72 | <i>l</i> 55°24 | <i>l</i> 56°32 | <i>l</i> 54°70 |                                                                                                  |
|                                                                                                                                         | <i>l</i> 54°86                              | <i>l</i> 55°22 | <i>l</i> 54°68 | <i>l</i> 55°66 | <i>l</i> 55°24 | <i>l</i> 55°08 | <i>l</i> 55°54 | <i>l</i> 56°58 |                                                                                                  |
|                                                                                                                                         | <i>l</i> 55°86                              | <i>l</i> 55°04 | <i>l</i> 53°76 | <i>l</i> 55°80 | <i>l</i> 54°54 | <i>l</i> 55°52 | <i>l</i> 55°78 | <i>l</i> 55°48 |                                                                                                  |
|                                                                                                                                         |                                             |                |                |                |                |                | <i>h</i> 56°00 |                |                                                                                                  |
|                                                                                                                                         | 55°38                                       | 55°15          | 54°77          | 55°41          | 54°83          | 55°28          | 55°91          | 55°59          |                                                                                                  |
| V & VI                                                                                                                                  | <i>l</i> 32°94                              | <i>l</i> 31°98 | <i>l</i> 32°32 | <i>l</i> 35°36 | <i>l</i> 34°50 | <i>l</i> 33°24 | <i>l</i> 32°54 | <i>l</i> 33°14 | <i>M</i> = 33''·23<br><br><i>w</i> = 13·36<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 43° 18' 33''·23 |
|                                                                                                                                         | <i>l</i> 35°00                              | <i>l</i> 31°80 | <i>l</i> 33°84 | <i>l</i> 33°42 | <i>l</i> 33°28 | <i>l</i> 33°70 | <i>l</i> 31°98 | <i>l</i> 32°96 |                                                                                                  |
|                                                                                                                                         | <i>l</i> 33°48                              | <i>l</i> 32°62 | <i>l</i> 34°42 | <i>l</i> 32°74 | <i>l</i> 33°80 | <i>l</i> 33°12 | <i>h</i> 32°92 | <i>l</i> 32°40 |                                                                                                  |
|                                                                                                                                         | 33°81                                       | 32°13          | 33°53          | 33°84          | 33°86          | 33°35          | 32°48          | 32°83          |                                                                                                  |

## At VIII—(Continued.)

March and April 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.

| Angle between                                                                                                          | Circle readings, telescope being set on VII |         |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------|---------|----------|---------|----------|---------|----------|----------------------------------------------------------------------------------------------|
|                                                                                                                        | 0° 1'                                       | 180° 1' | 9° 17'  | 189° 17' | 18° 33' | 198° 33' | 27° 49' | 207° 48' |                                                                                              |
| VI & IX                                                                                                                | "                                           | "       | "       | "        | "       | "        | "       | "        | <i>M</i> = 36''84<br><i>w</i> = 11 '96<br>$\frac{1}{w}$ = 0 '08<br><i>C</i> = 87° 47' 36''83 |
|                                                                                                                        | l 37'40                                     | l 34'40 | l 36'94 | l 34'86  | l 35'84 | l 37'22  | l 36'28 | l 38'66  |                                                                                              |
|                                                                                                                        | l 38'54                                     | l 36'72 | l 38'34 | l 36'42  | l 38'22 | l 36'64  | l 36'72 | l 38'02  |                                                                                              |
|                                                                                                                        | l 34'96                                     | l 36'98 | l 36'44 | l 37'74  | l 36'28 | l 36'72  | l 37'38 | l 37'26  |                                                                                              |
|                                                                                                                        |                                             |         |         | l 35'58  |         |          |         |          |                                                                                              |
|                                                                                                                        | 36'97                                       | 36'03   | 37'24   | 36'34    | 36'48   | 36'86    | 36'79   | 37'98    |                                                                                              |
| IX & XI                                                                                                                | l 34'94                                     | l 35'74 | l 36'00 | l 35'86  | l 34'54 | l 34'38  | l 33'66 | l 33'60  | <i>M</i> = 34''93<br><i>w</i> = 20 '00<br>$\frac{1}{w}$ = 0 '05<br><i>C</i> = 43° 15' 34''93 |
|                                                                                                                        | l 35'82                                     | l 34'48 | l 34'78 | l 33'46  | l 35'54 | l 34'16  | l 35'62 | l 35'46  |                                                                                              |
|                                                                                                                        | l 36'72                                     | l 35'16 | l 34'96 | l 34'04  | l 35'22 | l 34'82  | l 35'02 | l 34'40  |                                                                                              |
|                                                                                                                        | 35'83                                       | 35'13   | 35'25   | 34'45    | 35'10   | 34'45    | 34'77   | 34'49    |                                                                                              |
| At IX                                                                                                                  |                                             |         |         |          |         |          |         |          |                                                                                              |
| April 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite. |                                             |         |         |          |         |          |         |          |                                                                                              |
| Angle between                                                                                                          | Circle readings, telescope being set on R M |         |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                        | 0° 0'                                       | 180° 0' | 9° 16'  | 189° 16' | 18° 33' | 198° 33' | 27° 49' | 207° 49' |                                                                                              |
| R M & XI                                                                                                               | "                                           | "       | "       | "        | "       | "        | "       | "        | <i>M</i> = 32''82<br><i>w</i> = 20 '48<br>$\frac{1}{w}$ = 0 '05<br><i>C</i> = 25° 39' 32''82 |
|                                                                                                                        | l 32'42                                     | h 32'11 | l 33'42 | l 31'74  | l 32'92 | l 33'17  | h 33'48 | h 33'33  |                                                                                              |
|                                                                                                                        | l 32'60                                     | l 32'31 | l 32'64 | l 32'39  | l 33'19 | l 32'89  | h 33'49 | l 33'13  |                                                                                              |
|                                                                                                                        | l 31'49                                     | l 33'60 | l 32'98 | l 31'31  | l 33'23 | l 33'13  | h 33'81 | l 33'01  |                                                                                              |
|                                                                                                                        | 32'17                                       | 32'67   | 33'01   | 31'81    | 33'11   | 33'06    | 33'59   | 33'16    |                                                                                              |

KARACHI LONGITUDINAL SERIES.

| At IX—(Continued.)                                                                                                     |                                              |         |         |          |         |          |         |          |                                                                                              |
|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------|---------|----------|---------|----------|---------|----------|----------------------------------------------------------------------------------------------|
| April 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite. |                                              |         |         |          |         |          |         |          |                                                                                              |
| Angle between                                                                                                          | Circle readings, telescope being set on R. M |         |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                        | 0° 0'                                        | 180° 0' | 9° 16'  | 189° 16' | 18° 33' | 198° 33' | 27° 49' | 207° 49' |                                                                                              |
| XI & VIII                                                                                                              | "                                            | "       | "       | "        | "       | "        | "       | "        | <i>M</i> = 43''00<br><i>w</i> = 15 '15<br>$\frac{1}{w}$ = 0 '07<br><i>C</i> = 66° 19' 43''00 |
|                                                                                                                        | l 44'05                                      | l 42'29 | l 43'01 | l 43'79  | d 43'85 | d 41'94  | d 44'04 | d 42'07  |                                                                                              |
|                                                                                                                        | l 43'75                                      | d 41'78 | l 43'31 | l 42'20  | d 43'36 | d 42'49  | d 43'85 | d 42'68  |                                                                                              |
|                                                                                                                        | l 43'08                                      | d 42'07 | l 42'67 | l 43'14  | d 43'98 | d 42'17  | d 43'63 | d 42'71  |                                                                                              |
|                                                                                                                        | 43'63                                        | 42'05   | 43'00   | 43'03    | 43'73   | 42'20    | 43'84   | 42'49    |                                                                                              |
| VIII & VI                                                                                                              | d 51'00                                      | d 50'91 | d 50'34 | d 51'43  | d 49'84 | d 50'90  | d 49'85 | d 52'38  | <i>M</i> = 50''91<br><i>w</i> = 4 '81<br>$\frac{1}{w}$ = 0 '21<br><i>C</i> = 42° 42' 50''91  |
|                                                                                                                        | d 50'92                                      | d 50'77 | d 51'16 | d 52'72  | d 49'33 | d 51'13  | d 48'00 | d 52'82  |                                                                                              |
|                                                                                                                        | d 50'64                                      | d 51'00 | d 50'24 | d 53'05  | d 49'18 | d 51'94  | d 49'44 | d 52'31  |                                                                                              |
|                                                                                                                        | 50'85                                        | 50'89   | 50'58   | 52'61    | 49'45   | 51'32    | 49'10   | 52'50    |                                                                                              |
| VI & X                                                                                                                 | h 17'47                                      | d 19'50 | d 16'46 | d 17'16  | h 17'41 | h 19'02  | l 16'44 | d 15'93  | <i>M</i> = 17''35<br><i>w</i> = 5 '21<br>$\frac{1}{w}$ = 0 '19<br><i>C</i> = 69° 7' 17''35   |
|                                                                                                                        | h 17'61                                      | d 19'26 | d 15'84 | d 16'79  | h 18'24 | h 17'79  | l 18'63 | d 14'89  |                                                                                              |
|                                                                                                                        | h 16'99                                      | d 18'47 | d 16'01 | d 17'21  | d 18'09 | h 19'02  | l 17'31 | d 15'17  |                                                                                              |
|                                                                                                                        | 17'36                                        | 18'95   | 16'10   | 17'05    | 17'91   | 18'61    | 17'46   | 15'33    |                                                                                              |
| X & XII                                                                                                                | h 50'12                                      | d 48'31 | d 50'52 | l 49'03  | h 49'72 | h 48'25  | l 48'98 | l 49'04  | <i>M</i> = 49''14<br><i>w</i> = 14 '00<br>$\frac{1}{w}$ = 0 '07<br><i>C</i> = 33° 4' 49''14  |
|                                                                                                                        | h 49'86                                      | d 48'36 | d 50'14 | l 49'42  | h 49'55 | h 48'98  | l 48'31 | l 49'46  |                                                                                              |
|                                                                                                                        | h 49'78                                      | d 48'10 | d 50'16 | d 48'63  | h 49'32 | h 47'71  | l 48'55 | l 49'10  |                                                                                              |
|                                                                                                                        | 49'92                                        | 48'26   | 50'27   | 49'03    | 49'53   | 48'31    | 48'61   | 49'20    |                                                                                              |
| XII & XIII                                                                                                             | d 58'38                                      | d 59'8c | d 59'89 | l 58'24  | d 58'97 | d 59'05  | d 59'59 | d 59'84  | <i>M</i> = 59''26<br><i>w</i> = 19 '52<br>$\frac{1}{w}$ = 0 '05<br><i>C</i> = 69° 24' 59''26 |
|                                                                                                                        | d 58'06                                      | d 58'87 | d 59'47 | l 58'33  | d 58'94 | d 58'85  | d 59'97 | d 59'42  |                                                                                              |
|                                                                                                                        | d 59'55                                      | d 60'18 | d 60'33 | d 58'47  | d 58'70 | d 59'13  | d 60'08 | d 60'16  |                                                                                              |
|                                                                                                                        | 58'66                                        | 59'62   | 59'90   | 58'35    | 58'87   | 59'01    | 59'88   | 59'81    |                                                                                              |

| At X                                                                                                                          |                                              |         |          |          |          |          |          |          |                                                                                            |                                                                                            |                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------|----------|----------|----------|----------|----------|----------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <i>April 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                              |         |          |          |          |          |          |          |                                                                                            |                                                                                            |                                                                                           |
| Angle between                                                                                                                 | Circle readings, telescope being set on XII  |         |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |                                                                                            |                                                                                           |
|                                                                                                                               | 0° 1'                                        | 180° 1' | 9° 17'   | 189° 17' | 18° 34'  | 198° 34' | 27° 48'  | 207° 48' |                                                                                            |                                                                                            |                                                                                           |
| XII & IX                                                                                                                      | "                                            | "       | "        | "        | "        | "        | "        | "        | "                                                                                          | <i>M</i> = 50"·62<br><i>w</i> = 8·11<br>$\frac{1}{w}$ = 0·12<br><i>C</i> = 67° 5' 50"·62   |                                                                                           |
|                                                                                                                               | h 51'60                                      | l 49'58 | l 48'98  | h 51'00  | l 53'12  | l 52'20  | h 50'80  | h 49'96  |                                                                                            |                                                                                            |                                                                                           |
|                                                                                                                               | h 50'08                                      | l 49'62 | l 50'24  | h 49'38  | l 51'04  | l 52'18  | h 50'88  | h 50'42  |                                                                                            |                                                                                            |                                                                                           |
|                                                                                                                               | h 50'76                                      | l 48'88 | l 49'92  | l 50'06  | l 52'10  | l 51'00  | h 50'80  | h 50'38  |                                                                                            |                                                                                            |                                                                                           |
|                                                                                                                               | 50'81                                        | 49'36   | 49'71    | 50'15    | 52'04    | 51'79    | 50'83    | 50'25    |                                                                                            |                                                                                            |                                                                                           |
| IX & VI                                                                                                                       | h 11'50                                      | l 11'70 | l 12'60  | l 12'60  | l 8'72   | l 11'84  | h 9'72   | h 10'26  | <i>M</i> = 10"·72<br><i>w</i> = 11·83<br>$\frac{1}{w}$ = 0·08<br><i>C</i> = 61° 22' 10"·71 |                                                                                            |                                                                                           |
|                                                                                                                               | h 11'40                                      | l 10'04 | l 11'62  | l 11'40  | l 10'32  | l 10'18  | h 10'12  | h 9'90   |                                                                                            |                                                                                            |                                                                                           |
|                                                                                                                               | h 11'08                                      | l 11'50 | l 10'18  | l 9'78   | l 9'80   | l 11'12  | h 10'14  | h 9'80   |                                                                                            |                                                                                            |                                                                                           |
|                                                                                                                               |                                              |         |          | l 9'54   |          |          |          |          |                                                                                            |                                                                                            |                                                                                           |
|                                                                                                                               | 11'33                                        | 11'08   | 11'47    | 11'26    | 9'60     | 11'05    | 9'99     | 9'99     |                                                                                            |                                                                                            |                                                                                           |
| At XI                                                                                                                         |                                              |         |          |          |          |          |          |          |                                                                                            |                                                                                            |                                                                                           |
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                            |                                              |         |          |          |          |          |          |          |                                                                                            |                                                                                            |                                                                                           |
| Angle between                                                                                                                 | Circle readings, telescope being set on VIII |         |          |          |          |          |          |          |                                                                                            | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |                                                                                           |
|                                                                                                                               | 187° 17'                                     | 7° 17'  | 194° 29' | 14° 29'  | 201° 40' | 21° 40'  | 208° 52' | 28° 52'  | 216° 9'                                                                                    |                                                                                            | 36° 9'                                                                                    |
| VIII & IX                                                                                                                     | "                                            | "       | "        | "        | "        | "        | "        | "        | "                                                                                          | <i>M</i> = 45"·91<br><i>w</i> = 20·00<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 70° 24' 45"·91 |                                                                                           |
|                                                                                                                               | l 43'94                                      | l 45'20 | h 45'46  | l 45'82  | h 45'78  | h 45'16  | h 45'22  | h 47'34  | h 46'76                                                                                    |                                                                                            | h 46'60                                                                                   |
|                                                                                                                               | l 46'40                                      | l 46'18 | h 45'64  | l 46'02  | h 46'10  | h 45'36  | h 45'70  | h 46'58  | h 46'94                                                                                    |                                                                                            | h 45'90                                                                                   |
|                                                                                                                               | 45'17                                        | 45'69   | 45'55    | 45'92    | 45'94    | 45'26    | 45'46    | 46'96    | 46'85                                                                                      | 46'35                                                                                      |                                                                                           |
| IX & XIII                                                                                                                     | h 12'24                                      | h 14'86 | h 13'28  | h 12'96  | h 14'06  | h 10'98  | l 13'04  | l 10'78  | l 15'28                                                                                    | l 10'44                                                                                    | <i>M</i> = 12"·61<br><i>w</i> = 4·20<br>$\frac{1}{w}$ = 0·24<br><i>C</i> = 50° 41' 12"·61 |
|                                                                                                                               | h 12'30                                      | h 13'02 | h 12'26  | h 13'42  | h 12'96  | h 12'40  | l 12'54  | l 10'04  | l 15'06                                                                                    | l 10'22                                                                                    |                                                                                           |
|                                                                                                                               | 12'27                                        | 13'94   | 12'77    | 13'19    | 13'51    | 11'69    | 12'79    | 10'41    | 15'17                                                                                      | 10'33                                                                                      |                                                                                           |

| At XI—(Continued.)                                                                                                                              |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------------------------------------------------------------------|
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                                              |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| Angle between                                                                                                                                   | Circle readings, telescope being set on VIII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                                                 | 187° 17'                                     | 7° 17'          | 194° 29'        | 14° 29'         | 201° 40'        | 21° 40'         | 208° 52'        | 28° 52'         | 216° 9'         | 86° 9'          |                                                                                              |
| XIII & XIV                                                                                                                                      | "                                            | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 55''·80                                                                           |
|                                                                                                                                                 | <i>h</i> 56'·12                              | <i>h</i> 55'·82 | <i>h</i> 54'·80 | <i>h</i> 54'·34 | <i>h</i> 54'·86 | <i>h</i> 56'·14 | <i>l</i> 54'·80 | <i>l</i> 57'·68 | <i>l</i> 55'·52 | <i>l</i> 57'·84 | <i>w</i> = 9·60                                                                              |
|                                                                                                                                                 | <i>h</i> 55'·70                              | <i>h</i> 55'·86 | <i>h</i> 55'·00 | <i>h</i> 55'·54 | <i>h</i> 55'·80 | <i>h</i> 54'·76 | <i>l</i> 56'·62 | <i>l</i> 56'·50 | <i>l</i> 54'·52 | <i>l</i> 57'·70 | $\frac{1}{w}$ = 0·10                                                                         |
|                                                                                                                                                 | 55'·91                                       | 55'·84          | 54'·90          | 54'·94          | 55'·33          | 55'·45          | 55'·71          | 57'·09          | 55'·02          | 57'·77          | <i>C</i> = 51° 37' 55''·80                                                                   |
| At XII                                                                                                                                          |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| <i>April, May and December 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| Angle between                                                                                                                                   | Circle readings, telescope being set on XV   |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                                                 | 306° 27'                                     | 126° 27'        | 318° 38'        | 133° 39'        | 320° 51'        | 140° 51'        | 328° 2'         | 148° 2'         | 335° 15'        | 155° 15'        |                                                                                              |
| XV & XIII                                                                                                                                       | "                                            | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 40''·58                                                                           |
|                                                                                                                                                 | <i>h</i> 40'·44                              | <i>h</i> 40'·60 | <i>h</i> 42'·04 | <i>h</i> 40'·90 | <i>h</i> 41'·44 | <i>l</i> 39'·14 | <i>l</i> 39'·12 | <i>l</i> 40'·44 | <i>l</i> 41'·06 | <i>l</i> 39'·00 | <i>w</i> = 8·80                                                                              |
|                                                                                                                                                 | <i>h</i> 40'·28                              | <i>h</i> 41'·46 | <i>h</i> 42'·64 | <i>h</i> 41'·38 | <i>l</i> 41'·26 | <i>l</i> 40'·24 | <i>l</i> 38'·36 | <i>l</i> 40'·98 | <i>l</i> 40'·66 | <i>l</i> 40'·10 | $\frac{1}{w}$ = 0·11                                                                         |
|                                                                                                                                                 | 40'·36                                       | 41'·03          | 42'·34          | 41'·14          | 41'·35          | 39'·69          | 38'·74          | 40'·71          | 40'·86          | 39'·55          | <i>C</i> = 53° 33' 40''·58                                                                   |
| Lesser Circle-reading                                                                                                                           | 239° 46'                                     | 59° 45'         | 249° 1'         | 69° 1'          | 258° 18'        | 78° 18'         | 267° 33'        | 87° 33'         |                 |                 | <i>M</i> = 13''·43<br><i>w</i> = 15·12<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 40° 26' 13''·43 |
| XIII & IX                                                                                                                                       | <i>h</i> 13'·40                              | <i>l</i> 12'·96 | <i>l</i> 14'·60 | <i>l</i> 13'·16 | <i>l</i> 13'·68 | <i>h</i> 12'·58 | <i>l</i> 13'·12 | <i>l</i> 12'·06 |                 |                 |                                                                                              |
|                                                                                                                                                 | <i>h</i> 13'·68                              | <i>l</i> 14'·34 | <i>l</i> 12'·36 | <i>l</i> 14'·26 | <i>h</i> 14'·26 | <i>h</i> 13'·64 | <i>l</i> 13'·24 | <i>l</i> 11'·18 |                 |                 |                                                                                              |
|                                                                                                                                                 | <i>h</i> 13'·68                              | <i>l</i> 14'·16 | <i>l</i> 13'·50 | <i>l</i> 14'·78 | <i>h</i> 13'·66 | <i>h</i> 12'·88 | <i>l</i> 14'·16 | <i>l</i> 12'·90 |                 |                 |                                                                                              |
|                                                                                                                                                 | 13'·59                                       | 13'·82          | 13'·49          | 14'·07          | 13'·87          | 13'·03          | 13'·51          | 12'·05          |                 |                 |                                                                                              |



| <i>At XII—(Continued.)</i>                                                                                                                      |                                              |                |                |                |                |                |                |                |                                                                                       |                                                                                                    |                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <i>April, May and December 1849, observed by Captains T. Renny and A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                |                |                |                |                |                |                |                                                                                       |                                                                                                    |                                                                                                  |
| Angle between                                                                                                                                   | Circle readings, telescope being set on XIII |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |                                                                                                    |                                                                                                  |
|                                                                                                                                                 | 239° 46'                                     | 59° 45'        | 249° 1'        | 69° 1'         | 258° 18'       | 78 18'         | 267° 33'       | 87° 33'        |                                                                                       |                                                                                                    |                                                                                                  |
| IX & X                                                                                                                                          | "                                            | "              | "              | "              | "              | "              | "              | "              | "                                                                                     | <i>M</i> = 22''·78<br><br><i>w</i> = 10 ·52<br>$\frac{1}{w}$ = 0 ·10<br><i>C</i> = 79° 49' 22''·76 |                                                                                                  |
|                                                                                                                                                 | <i>h</i> 21'42                               | <i>l</i> 24'86 | <i>l</i> 23'66 | <i>l</i> 25'24 | <i>l</i> 20'64 | <i>h</i> 23'46 | <i>l</i> 20'08 | <i>l</i> 21'94 |                                                                                       |                                                                                                    |                                                                                                  |
|                                                                                                                                                 | <i>h</i> 23'02                               | <i>l</i> 23'74 | <i>l</i> 23'40 | <i>l</i> 23'28 | <i>h</i> 22'24 | <i>h</i> 22'56 | <i>l</i> 23'58 | <i>l</i> 23'96 |                                                                                       |                                                                                                    |                                                                                                  |
|                                                                                                                                                 | <i>h</i> 22'96                               | <i>l</i> 22'76 | <i>l</i> 22'40 | <i>l</i> 22'10 | <i>h</i> 22'12 | <i>h</i> 22'12 | <i>l</i> 21'24 | <i>l</i> 23'32 |                                                                                       |                                                                                                    |                                                                                                  |
|                                                                                                                                                 |                                              |                | <i>l</i> 22'84 | <i>h</i> 22'08 |                |                | <i>l</i> 22'58 |                |                                                                                       |                                                                                                    |                                                                                                  |
|                                                                                                                                                 | 22'47                                        | 23'79          | 23'15          | 23'37          | 21'77          | 22'71          | 21'87          | 23'07          |                                                                                       |                                                                                                    |                                                                                                  |
| <i>At XIII</i>                                                                                                                                  |                                              |                |                |                |                |                |                |                |                                                                                       |                                                                                                    |                                                                                                  |
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                                              |                                              |                |                |                |                |                |                |                |                                                                                       |                                                                                                    |                                                                                                  |
| Angle between                                                                                                                                   | Circle readings, telescope being set on IX   |                |                |                |                |                |                |                |                                                                                       | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle              |                                                                                                  |
|                                                                                                                                                 | 0° 1'                                        | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 49'                                                                               |                                                                                                    | 208° 49'                                                                                         |
| IX & XII                                                                                                                                        | "                                            | "              | "              | "              | "              | "              | "              | "              | "                                                                                     | <i>M</i> = 51''·84<br><br><i>w</i> = 5 ·70<br>$\frac{1}{w}$ = 0 ·18<br><i>C</i> = 70° 8' 51''·84   |                                                                                                  |
|                                                                                                                                                 | <i>h</i> 51'00                               | <i>h</i> 50'80 | <i>l</i> 52'22 | <i>l</i> 52'04 | <i>l</i> 50'40 | <i>l</i> 52'66 | <i>l</i> 53'48 | <i>l</i> 50'16 | <i>l</i> 53'64                                                                        |                                                                                                    | <i>l</i> 52'92                                                                                   |
|                                                                                                                                                 | <i>h</i> 51'84                               | <i>l</i> 48'72 | <i>l</i> 53'26 | <i>l</i> 51'00 | <i>l</i> 51'30 | <i>l</i> 51'26 | <i>l</i> 53'08 | <i>l</i> 50'96 | <i>l</i> 51'96                                                                        |                                                                                                    | <i>l</i> 54'16                                                                                   |
|                                                                                                                                                 | 51'42                                        | 49'76          | 52'74          | 51'52          | 50'85          | 51'96          | 53'28          | 50'56          | 52'80                                                                                 | 53'54                                                                                              |                                                                                                  |
| XII & XV                                                                                                                                        | <i>h</i> 8'64                                | <i>l</i> 5'94  | <i>l</i> 6'28  | <i>l</i> 6'22  | <i>l</i> 9'12  | <i>l</i> 5'42  | <i>l</i> 6'20  | <i>l</i> 8'30  | <i>l</i> 5'36                                                                         | <i>l</i> 4'82                                                                                      | <i>M</i> = 6''·51<br><br><i>w</i> = 5 ·70<br>$\frac{1}{w}$ = 0 ·18<br><i>C</i> = 72° 50' 6''·51  |
|                                                                                                                                                 | <i>h</i> 6'24                                | <i>l</i> 7'38  | <i>l</i> 7'02  | <i>l</i> 7'98  | <i>l</i> 8'00  | <i>l</i> 5'06  | <i>l</i> 6'42  | <i>l</i> 6'56  | <i>l</i> 4'98                                                                         | <i>l</i> 4'24                                                                                      |                                                                                                  |
|                                                                                                                                                 | 7'44                                         | 6'66           | 6'65           | 7'10           | 8'56           | 5'24           | 6'31           | 7'43           | 5'17                                                                                  | 4'53                                                                                               |                                                                                                  |
| XV & XVI                                                                                                                                        | <i>h</i> 48'46                               | <i>l</i> 49'24 | <i>l</i> 50'46 | <i>l</i> 50'06 | <i>l</i> 49'36 | <i>l</i> 52'44 | <i>l</i> 48'90 | <i>l</i> 49'60 | <i>h</i> 52'18                                                                        | <i>l</i> 50'50                                                                                     | <i>M</i> = 50''·2<br><br><i>w</i> = 5 ·10<br>$\frac{1}{w}$ = 0 ·20<br><i>C</i> = 55° 44' 50''·32 |
|                                                                                                                                                 | <i>h</i> 50'40                               | <i>l</i> 48'26 | <i>l</i> 51'72 | <i>l</i> 51'20 | <i>l</i> 48'58 | <i>l</i> 52'92 | <i>l</i> 49'16 | <i>l</i> 50'24 | <i>h</i> 52'24                                                                        | <i>l</i> 50'50                                                                                     |                                                                                                  |
|                                                                                                                                                 | 49'43                                        | 48'75          | 51'09          | 50'63          | 48'97          | 52'68          | 49'03          | 49'92          | 52'21                                                                                 | 50'50                                                                                              |                                                                                                  |

| At XIII—(Continued.)                                                                               |                                            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
|----------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------------------------------------------------------|
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| Angle between                                                                                      | Circle readings, telescope being set on IX |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                    | 0° 1'                                      | 180° 1'         | 7° 12'          | 187° 12'        | 14° 24'         | 194° 24'        | 21° 36'         | 201° 36'        | 28° 48'         | 208° 48'        |                                                                                       |
| XVI & XIV                                                                                          | "                                          | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 44" 42                                                                     |
|                                                                                                    | <i>h</i> 44' 78                            | <i>l</i> 45' 40 | <i>l</i> 42' 56 | <i>l</i> 43' 22 | <i>l</i> 43' 68 | <i>l</i> 46' 30 | <i>l</i> 43' 22 | <i>l</i> 44' 96 | <i>l</i> 44' 72 | <i>l</i> 45' 94 | <i>w</i> = 4 '50                                                                      |
|                                                                                                    | <i>h</i> 42' 98                            | <i>l</i> 45' 12 | <i>l</i> 42' 16 | <i>l</i> 41' 54 | <i>l</i> 45' 58 | <i>l</i> 45' 78 | <i>l</i> 42' 94 | <i>l</i> 46' 28 | <i>l</i> 44' 72 | <i>l</i> 46' 48 | $\frac{1}{w}$ = 0 '22                                                                 |
|                                                                                                    | 43' 88                                     | 45' 26          | 42' 36          | 42' 38          | 44' 63          | 46' 04          | 43' 08          | 45' 62          | 44' 72          | 46' 21          | <i>C</i> = 48° 7' 44" 42                                                              |
| XIV & XI                                                                                           | <i>h</i> 60' 20                            | <i>h</i> 61' 32 | <i>l</i> 60' 08 | <i>l</i> 58' 72 | <i>l</i> 60' 20 | <i>l</i> 57' 78 | <i>l</i> 60' 28 | <i>l</i> 58' 78 | <i>l</i> 60' 42 | <i>l</i> 60' 32 | <i>M</i> = 59" 60                                                                     |
|                                                                                                    | <i>h</i> 59' 14                            | <i>l</i> 59' 88 | <i>l</i> 60' 04 | <i>l</i> 59' 20 | <i>l</i> 60' 98 | <i>l</i> 59' 68 | <i>l</i> 61' 28 | <i>l</i> 57' 08 | <i>l</i> 58' 88 | <i>l</i> 57' 72 | <i>w</i> = 8 '70                                                                      |
|                                                                                                    |                                            |                 |                 |                 |                 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0 '11                                                                 |
|                                                                                                    | 59' 67                                     | 60' 60          | 60' 06          | 58' 96          | 60' 59          | 58' 73          | 60' 78          | 57' 93          | 59' 65          | 59' 02          | <i>C</i> = 63° 9' 59" 60                                                              |
| XI & IX                                                                                            | <i>h</i> 27' 60                            | <i>l</i> 27' 48 | <i>l</i> 28' 14 | <i>l</i> 30' 14 | <i>l</i> 27' 42 | <i>l</i> 26' 70 | <i>l</i> 28' 50 | <i>l</i> 28' 98 | <i>l</i> 27' 44 | <i>l</i> 24' 94 | <i>M</i> = 27" 72                                                                     |
|                                                                                                    | <i>h</i> 29' 04                            | <i>l</i> 27' 18 | <i>l</i> 27' 70 | <i>l</i> 30' 22 | <i>l</i> 25' 92 | <i>l</i> 24' 38 | <i>l</i> 28' 00 | <i>l</i> 28' 88 | <i>l</i> 28' 38 | <i>l</i> 27' 26 | <i>w</i> = 4 '80                                                                      |
|                                                                                                    |                                            |                 |                 |                 |                 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0 '21                                                                 |
|                                                                                                    | 28' 32                                     | 27' 33          | 27' 92          | 30' 18          | 26' 67          | 25' 54          | 28' 25          | 28' 93          | 27' 91          | 26' 10          | <i>C</i> = 49° 58' 27" 72                                                             |
| At XIV                                                                                             |                                            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| Angle between                                                                                      | Circle readings, telescope being set on XI |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                    | 236° 30'                                   | 56° 30'         | 243° 42'        | 63° 41'         | 250° 53'        | 70° 53'         | 258° 5'         | 78° 5'          | 265° 18'        | 85° 18'         |                                                                                       |
| XI & XIII                                                                                          | "                                          | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 7" 91                                                                      |
|                                                                                                    | <i>h</i> 9' 04                             | <i>h</i> 7' 50  | <i>h</i> 8' 12  | <i>h</i> 7' 54  | <i>l</i> 6' 46  | <i>l</i> 7' 94  | <i>l</i> 7' 86  | <i>l</i> 7' 40  | <i>l</i> 7' 22  | <i>l</i> 6' 80  | <i>w</i> = 17 '20                                                                     |
|                                                                                                    | <i>h</i> 9' 36                             | <i>h</i> 7' 22  | <i>h</i> 8' 66  | <i>h</i> 7' 92  | <i>l</i> 6' 90  | <i>l</i> 8' 40  | <i>l</i> 8' 60  | <i>l</i> 9' 18  | <i>l</i> 7' 84  | <i>l</i> 8' 22  | $\frac{1}{w}$ = 0 '06                                                                 |
|                                                                                                    | 9' 20                                      | 7' 36           | 8' 39           | 7' 73           | 6' 68           | 8' 17           | 8' 23           | 8' 29           | 7' 53           | 7' 51           | <i>C</i> = 65° 12' 7" 91                                                              |
| XIII & XVI                                                                                         | <i>h</i> 1' 28                             | <i>h</i> 3' 30  | <i>h</i> 2' 54  | <i>h</i> 2' 54  | <i>l</i> 2' 02  | <i>l</i> 3' 62  | <i>l</i> 1' 28  | <i>l</i> 4' 08  | <i>l</i> 1' 32  | <i>l</i> 2' 80  | <i>M</i> = 2" 47                                                                      |
|                                                                                                    | <i>h</i> 2' 20                             | <i>h</i> 2' 74  | <i>h</i> 2' 86  | <i>h</i> 2' 08  | <i>l</i> 0' 92  | <i>l</i> 4' 34  | <i>l</i> 1' 78  | <i>l</i> 3' 94  | <i>l</i> 1' 46  | <i>l</i> 2' 24  | <i>w</i> = 9 '90                                                                      |
|                                                                                                    |                                            |                 |                 |                 |                 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0 '10                                                                 |
|                                                                                                    | 1' 74                                      | 3' 02           | 2' 70           | 2' 31           | 1' 47           | 3' 98           | 1' 53           | 4' 01           | 1' 39           | 2' 52           | <i>C</i> = 58° 19' 2" 47                                                              |

## OBSERVED ANGLES.

37—B.

| At XV                                                                                                           |                                              |          |          |          |          |          |          |          |          |          |                                                                  |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|------------------------------------------------------------------|
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>              |                                              |          |          |          |          |          |          |          |          |          |                                                                  |
| Angle<br>between                                                                                                | Circle readings, telescope being set on XVII |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                                 | 0° 1'                                        | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                  |
| XVII &<br>XVIII                                                                                                 | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 49''·35                                                      |
|                                                                                                                 | h 48° 72                                     | h 49° 08 | l 48° 24 | l 49° 56 | l 49° 62 | l 50° 46 | l 49° 70 | l 48° 62 | l 50° 24 | l 49° 52 | w = 18 ·90                                                       |
|                                                                                                                 | h 48° 90                                     | h 48° 66 | l 48° 30 | l 49° 64 | l 50° 28 | l 49° 60 | l 49° 46 | l 48° 90 | l 48° 48 | l 51° 10 | $\frac{1}{w} = 0 \cdot 05$                                       |
|                                                                                                                 | 48° 81                                       | 48° 87   | 48° 27   | 49° 60   | 49° 95   | 50° 03   | 49° 58   | 48° 76   | 49° 36   | 50° 31   | C = 42° 51' 49''·35                                              |
| XVIII &<br>XVI                                                                                                  | h 15° 58                                     | h 15° 74 | l 16° 66 | l 16° 80 | l 16° 34 | l 15° 24 | l 17° 60 | l 14° 80 | l 16° 48 | l 14° 84 | M = 16''·16                                                      |
|                                                                                                                 | h 15° 78                                     | h 15° 50 | l 17° 90 | l 16° 68 | l 16° 82 | l 16° 48 | l 17° 46 | l 15° 16 | l 16° 26 | l 15° 08 | w = 11 ·90                                                       |
|                                                                                                                 | 15° 68                                       | 15° 62   | 17° 28   | 16° 74   | 16° 58   | 15° 86   | 17° 53   | 14° 98   | 16° 37   | 14° 96   | $\frac{1}{w} = 0 \cdot 08$                                       |
|                                                                                                                 |                                              |          |          |          |          |          |          |          |          |          | C = 42° 8' 16''·16                                               |
| XVI &<br>XIII                                                                                                   | h 52° 04                                     | h 51° 12 | l 51° 36 | l 50° 52 | l 51° 20 | l 52° 90 | l 50° 92 | l 53° 40 | l 51° 66 | l 53° 00 | M = 51''·53                                                      |
|                                                                                                                 | h 51° 20                                     | h 51° 72 | l 49° 96 | l 50° 86 | l 51° 38 | l 51° 62 | l 50° 42 | l 52° 70 | l 51° 62 | l 50° 94 | w = 13 ·90                                                       |
|                                                                                                                 | 51° 62                                       | 51° 42   | 50° 66   | 50° 69   | 51° 29   | 52° 26   | 50° 67   | 53° 05   | 51° 64   | 51° 97   | $\frac{1}{w} = 0 \cdot 07$                                       |
|                                                                                                                 |                                              |          |          |          |          |          |          |          |          |          | C = 41° 57' 51''·53                                              |
| XIII & XII                                                                                                      | h 17° 08                                     | h 16° 42 | l 16° 58 | l 15° 14 | l 16° 40 | l 14° 90 | l 16° 02 | l 17° 10 | l 17° 34 | l 16° 82 | M = 16''·42                                                      |
|                                                                                                                 | h 17° 14                                     | h 16° 36 | l 16° 72 | l 15° 70 | l 15° 60 | l 15° 46 | l 16° 58 | l 16° 90 | l 16° 32 | l 17° 90 | w = 17 ·50                                                       |
|                                                                                                                 | 17° 11                                       | 16° 39   | 16° 65   | 15° 42   | 16° 00   | 15° 18   | 16° 30   | 17° 00   | 16° 83   | 17° 36   | $\frac{1}{w} = 0 \cdot 06$                                       |
|                                                                                                                 |                                              |          |          |          |          |          |          |          |          |          | C = 53° 36' 16''·42                                              |
| At XVI                                                                                                          |                                              |          |          |          |          |          |          |          |          |          |                                                                  |
| <i>November and December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |          |          |          |          |          |          |          |          |          |                                                                  |
| Angle<br>between                                                                                                | Circle readings, telescope being set on XIV  |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                                 | 337° 37'                                     | 157° 37' | 344° 48' | 164° 48' | 352° 0'  | 172° 0'  | 359° 12' | 179° 12' | 6° 24'   | 186° 24' |                                                                  |
| XIV &<br>R M                                                                                                    | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 60''·17                                                      |
|                                                                                                                 | h 58° 26                                     | h 60° 24 | h 60° 66 | h 62° 80 | l 60° 40 | h 58° 94 | l 59° 66 | l 61° 00 | l 59° 86 | l 59° 14 | w = 12 ·82                                                       |
|                                                                                                                 | h 59° 62                                     | h 59° 46 | h 61° 06 | h 60° 16 | l 61° 12 | h 60° 94 | l 59° 30 | l 59° 92 | l 60° 54 | l 59° 82 | $\frac{1}{w} = 0 \cdot 08$                                       |
|                                                                                                                 |                                              |          |          |          | d 60° 63 |          |          |          |          |          | C = 22° 23' 60''·17                                              |
|                                                                                                                 | 58° 94                                       | 59° 85   | 60° 86   | 61° 48   | 60° 76   | 60° 17   | 59° 48   | 60° 46   | 60° 20   | 59° 48   |                                                                  |

| At XIII—(Continued.)                                                                               |                                            |                |                |                |                |                |                |                |                |                |                                                                                       |
|----------------------------------------------------------------------------------------------------|--------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------------------------------------------------------------------------|
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                            |                |                |                |                |                |                |                |                |                |                                                                                       |
| Angle between                                                                                      | Circle readings, telescope being set on IX |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                    | 0° 1'                                      | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                       |
| XVI & XIV                                                                                          | "                                          | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 44".42                                                                     |
|                                                                                                    | <i>h</i> 44.78                             | <i>l</i> 45.40 | <i>l</i> 42.56 | <i>l</i> 43.22 | <i>l</i> 43.68 | <i>l</i> 46.30 | <i>l</i> 43.22 | <i>l</i> 44.96 | <i>l</i> 44.72 | <i>l</i> 45.94 | <i>w</i> = 4.50                                                                       |
|                                                                                                    | <i>h</i> 42.98                             | <i>l</i> 45.12 | <i>l</i> 42.16 | <i>l</i> 41.54 | <i>l</i> 45.58 | <i>l</i> 45.78 | <i>l</i> 42.94 | <i>l</i> 46.28 | <i>l</i> 44.72 | <i>l</i> 46.48 | $\frac{1}{w}$ = 0.22                                                                  |
|                                                                                                    | 43.88                                      | 45.26          | 42.36          | 42.38          | 44.63          | 46.04          | 43.08          | 45.62          | 44.72          | 46.21          | <i>C</i> = 48° 7' 44".42                                                              |
| XIV & XI                                                                                           | <i>h</i> 60.20                             | <i>h</i> 61.32 | <i>l</i> 60.08 | <i>l</i> 58.72 | <i>l</i> 60.20 | <i>l</i> 57.78 | <i>l</i> 60.28 | <i>l</i> 58.78 | <i>l</i> 60.42 | <i>l</i> 60.32 | <i>M</i> = 59".60                                                                     |
|                                                                                                    | <i>h</i> 59.14                             | <i>l</i> 59.88 | <i>l</i> 60.04 | <i>l</i> 59.20 | <i>l</i> 60.98 | <i>l</i> 59.68 | <i>l</i> 61.28 | <i>l</i> 57.08 | <i>l</i> 58.88 | <i>l</i> 57.72 | <i>w</i> = 8.70                                                                       |
|                                                                                                    |                                            |                |                |                |                |                |                |                |                |                | $\frac{1}{w}$ = 0.11                                                                  |
|                                                                                                    | 59.67                                      | 60.60          | 60.06          | 58.96          | 60.59          | 58.73          | 60.78          | 57.93          | 59.65          | 59.02          | <i>C</i> = 63° 9' 59".60                                                              |
| XI & IX                                                                                            | <i>h</i> 27.60                             | <i>l</i> 27.48 | <i>l</i> 28.14 | <i>l</i> 30.14 | <i>l</i> 27.42 | <i>l</i> 26.70 | <i>l</i> 28.50 | <i>l</i> 28.98 | <i>l</i> 27.44 | <i>l</i> 24.94 | <i>M</i> = 27".72                                                                     |
|                                                                                                    | <i>h</i> 29.04                             | <i>l</i> 27.18 | <i>l</i> 27.70 | <i>l</i> 30.22 | <i>l</i> 25.92 | <i>l</i> 24.38 | <i>l</i> 28.00 | <i>l</i> 28.88 | <i>l</i> 28.38 | <i>l</i> 27.26 | <i>w</i> = 4.80                                                                       |
|                                                                                                    |                                            |                |                |                |                |                |                |                |                |                | $\frac{1}{w}$ = 0.21                                                                  |
|                                                                                                    | 28.32                                      | 27.33          | 27.92          | 30.18          | 26.67          | 25.54          | 28.25          | 28.93          | 27.91          | 26.10          | <i>C</i> = 49° 58' 27".72                                                             |
| At XIV                                                                                             |                                            |                |                |                |                |                |                |                |                |                |                                                                                       |
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                            |                |                |                |                |                |                |                |                |                |                                                                                       |
| Angle between                                                                                      | Circle readings, telescope being set on XI |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                    | 236° 30'                                   | 56° 30'        | 248° 42'       | 68° 41'        | 250° 53'       | 70° 53'        | 258° 5'        | 78° 5'         | 265° 18'       | 85° 18'        |                                                                                       |
| XI & XIII                                                                                          | "                                          | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 7".91                                                                      |
|                                                                                                    | <i>h</i> 9.04                              | <i>h</i> 7.50  | <i>h</i> 8.12  | <i>h</i> 7.54  | <i>l</i> 6.46  | <i>l</i> 7.94  | <i>l</i> 7.86  | <i>l</i> 7.40  | <i>l</i> 7.22  | <i>l</i> 6.80  | <i>w</i> = 17.20                                                                      |
|                                                                                                    | <i>h</i> 9.36                              | <i>h</i> 7.22  | <i>h</i> 8.66  | <i>h</i> 7.92  | <i>l</i> 6.90  | <i>l</i> 8.40  | <i>l</i> 8.60  | <i>l</i> 9.18  | <i>l</i> 7.84  | <i>l</i> 8.22  | $\frac{1}{w}$ = 0.06                                                                  |
|                                                                                                    | 9.20                                       | 7.36           | 8.39           | 7.73           | 6.68           | 8.17           | 8.23           | 8.29           | 7.53           | 7.51           | <i>C</i> = 65° 12' 7".91                                                              |
| XIII & XVI                                                                                         | <i>h</i> 1.28                              | <i>h</i> 3.30  | <i>h</i> 2.54  | <i>h</i> 2.54  | <i>l</i> 2.02  | <i>l</i> 3.62  | <i>l</i> 1.28  | <i>l</i> 4.08  | <i>l</i> 1.32  | <i>l</i> 2.80  | <i>M</i> = 2".47                                                                      |
|                                                                                                    | <i>h</i> 2.20                              | <i>h</i> 2.74  | <i>h</i> 2.86  | <i>h</i> 2.08  | <i>l</i> 0.92  | <i>l</i> 4.34  | <i>l</i> 1.78  | <i>l</i> 3.94  | <i>l</i> 1.46  | <i>l</i> 2.24  | <i>w</i> = 9.90                                                                       |
|                                                                                                    |                                            |                |                |                |                |                |                |                |                |                | $\frac{1}{w}$ = 0.10                                                                  |
|                                                                                                    | 1.74                                       | 3.02           | 2.70           | 2.31           | 1.47           | 3.98           | 1.53           | 4.01           | 1.39           | 2.52           | <i>C</i> = 58° 19' 2".47                                                              |

| At XV                                                                                                           |                                              |          |          |          |          |          |          |          |          |          |                                                                  |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|------------------------------------------------------------------|
| <i>December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>              |                                              |          |          |          |          |          |          |          |          |          |                                                                  |
| Angle<br>between                                                                                                | Circle readings, telescope being set on XVII |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                                 | 0° 1'                                        | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                  |
| XVII &<br>XVIII                                                                                                 | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 49''·35                                                      |
|                                                                                                                 | h 48° 72                                     | h 49° 08 | l 48° 24 | l 49° 56 | l 49° 62 | l 50° 46 | l 49° 70 | l 48° 62 | l 50° 24 | l 49° 52 | w = 18 ·90                                                       |
| .                                                                                                               | h 48° 90                                     | h 48° 66 | l 48° 30 | l 49° 64 | l 50° 28 | l 49° 60 | l 49° 46 | l 48° 90 | l 48° 48 | l 51° 10 | $\frac{1}{w} = 0 \cdot 05$                                       |
|                                                                                                                 | 48° 81                                       | 48° 87   | 48° 27   | 49° 60   | 49° 95   | 50° 03   | 49° 58   | 48° 76   | 49° 36   | 50° 31   | C = 42° 51' 49''·35                                              |
| XVIII &<br>XVI                                                                                                  | h 15° 58                                     | h 15° 74 | l 16° 66 | l 16° 80 | l 16° 34 | l 15° 24 | l 17° 60 | l 14° 80 | l 16° 48 | l 14° 84 | M = 16''·16                                                      |
|                                                                                                                 | h 15° 78                                     | h 15° 50 | l 17° 90 | l 16° 68 | l 16° 82 | l 16° 48 | l 17° 46 | l 15° 16 | l 16° 26 | l 15° 08 | w = 11 ·90                                                       |
|                                                                                                                 | 15° 68                                       | 15° 62   | 17° 28   | 16° 74   | 16° 58   | 15° 86   | 17° 53   | 14° 98   | 16° 37   | 14° 96   | $\frac{1}{w} = 0 \cdot 08$                                       |
|                                                                                                                 |                                              |          |          |          |          |          |          |          |          |          | C = 42° 8' 16''·16                                               |
| XVI &<br>XIII                                                                                                   | h 52° 04                                     | h 51° 12 | l 51° 36 | l 50° 52 | l 51° 20 | l 52° 90 | l 50° 92 | l 53° 40 | l 51° 66 | l 53° 00 | M = 51''·53                                                      |
|                                                                                                                 | h 51° 20                                     | h 51° 72 | l 49° 96 | l 50° 86 | l 51° 38 | l 51° 62 | l 50° 42 | l 52° 70 | l 51° 62 | l 50° 94 | w = 13 ·90                                                       |
|                                                                                                                 | 51° 62                                       | 51° 42   | 50° 66   | 50° 69   | 51° 29   | 52° 26   | 50° 67   | 53° 05   | 51° 64   | 51° 97   | $\frac{1}{w} = 0 \cdot 07$                                       |
|                                                                                                                 |                                              |          |          |          |          |          |          |          |          |          | C = 41° 57' 51''·53                                              |
| XIII & XII                                                                                                      | h 17° 08                                     | h 16° 42 | l 16° 58 | l 15° 14 | l 16° 40 | l 14° 90 | l 16° 02 | l 17° 10 | l 17° 34 | l 16° 82 | M = 16''·42                                                      |
|                                                                                                                 | h 17° 14                                     | h 16° 36 | l 16° 72 | l 15° 70 | l 15° 60 | l 15° 46 | l 16° 58 | l 16° 90 | l 16° 32 | l 17° 90 | w = 17 ·50                                                       |
|                                                                                                                 | 17° 11                                       | 16° 39   | 16° 65   | 15° 42   | 16° 00   | 15° 18   | 16° 30   | 17° 00   | 16° 83   | 17° 36   | $\frac{1}{w} = 0 \cdot 06$                                       |
|                                                                                                                 |                                              |          |          |          |          |          |          |          |          |          | C = 53° 36' 16''·42                                              |
| At XVI                                                                                                          |                                              |          |          |          |          |          |          |          |          |          |                                                                  |
| <i>November and December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |          |          |          |          |          |          |          |          |          |                                                                  |
| Angle<br>between                                                                                                | Circle readings, telescope being set on XIV  |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                                 | 337° 37'                                     | 157° 37' | 344° 48' | 164° 48' | 352° 0'  | 172° 0'  | 359° 12' | 179° 12' | 6° 24'   | 186° 24' |                                                                  |
| XIV &<br>R M                                                                                                    | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 60''·17                                                      |
|                                                                                                                 | h 58° 26                                     | h 60° 24 | h 60° 66 | h 62° 80 | l 60° 40 | h 58° 94 | l 59° 66 | l 61° 00 | l 59° 86 | l 59° 14 | w = 12 ·82                                                       |
|                                                                                                                 | h 59° 62                                     | h 59° 46 | h 61° 06 | h 60° 16 | l 61° 12 | h 60° 94 | l 59° 30 | l 59° 92 | l 60° 54 | l 59° 82 | $\frac{1}{w} = 0 \cdot 08$                                       |
|                                                                                                                 | 58° 94                                       | 59° 85   | 60° 86   | 61° 48   | 60° 76   | 60° 17   | 59° 48   | 60° 46   | 60° 20   | 59° 48   | C = 22° 23' 60''·17                                              |

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| At XVI—(Continued.)                                                                                                 |                                             |          |          |          |          |          |          |          |         |          |                                                                  |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------|----------|----------|----------|----------|----------|----------|---------|----------|------------------------------------------------------------------|
| <i>November and December 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>     |                                             |          |          |          |          |          |          |          |         |          |                                                                  |
| Angle between                                                                                                       | Circle readings, telescope being set on XIV |          |          |          |          |          |          |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                                     | 887° 37'                                    | 157° 37' | 344° 48' | 164° 48' | 352° 0'  | 172° 0'  | 359° 12' | 179° 12' | 6° 24'  | 186° 24' |                                                                  |
| R M & XIII                                                                                                          | "                                           | "        | "        | "        | "        | "        | "        | "        | "       | "        | M = 14''84<br>w = 7.01<br>1/w = 0.14<br>C = 51° 9' 14''87        |
|                                                                                                                     | h 14'86                                     | h 14'20  | h 14'88  | h 15'24  | l 14'40  | h 16'78  | l 14'90  | l 14'68  | l 14'68 | l 16'10  |                                                                  |
|                                                                                                                     | h 14'56                                     | h 14'04  | h 15'06  | h 15'62  | l 16'04  | h 15'88  | l 13'94  | l 12'74  | l 14'20 | l 10'50  |                                                                  |
|                                                                                                                     | 14'71                                       | 14'12    | 14'97    | 15'43    | 15'22    | 16'63    | 14'42    | 13'71    | 14'44   | 14'72    |                                                                  |
| XIII & XV                                                                                                           | h 22'98                                     | h 19'38  | h 20'58  | h 19'60  | l 21'52  | l 19'78  | l 21'94  | l 20'24  | l 22'30 | d 23'15  | M = 21''15<br>w = 5.60<br>1/w = 0.18<br>C = 82° 17' 21''15       |
|                                                                                                                     | h 22'66                                     | h 20'94  | h 19'86  | h 19'32  | l 20'38  | d 20'69  | l 23'58  | l 21'68  | l 22'22 | d 23'03  |                                                                  |
|                                                                                                                     |                                             |          |          |          |          | d 20'93  |          |          |         | d 18'26  |                                                                  |
|                                                                                                                     | 22'82                                       | 20'16    | 20'22    | 19'46    | 20'95    | 20'47    | 22'76    | 20'96    | 22'26   | 21'48    |                                                                  |
| XV & XVII                                                                                                           | d 50'59                                     | h 55'40  | h 53'30  | h 54'34  | l 55'10  | d 52'52  | l 53'32  | l 52'84  | l 54'88 | l 53'48  | M = 53''04<br>w = 4.80<br>1/w = 0.21<br>C = 37° 16' 53''04       |
|                                                                                                                     | d 50'89                                     | h 52'78  | h 53'48  | h 53'32  | l 53'32  | d 53'04  | l 52'12  | l 54'00  | l 53'48 | d 48'65  |                                                                  |
|                                                                                                                     | 50'74                                       | 54'09    | 53'39    | 53'83    | 54'21    | 52'78    | 52'72    | 53'42    | 54'18   | 51'07    |                                                                  |
| XVII & XVIII                                                                                                        | d 27'92                                     | h 26'02  | h 27'82  | h 26'72  | l 25'62  | d 28'32  | l 25'82  | l 27'78  | l 24'32 | l 27'96  | M = 26''84<br>w = 8.30<br>1/w = 0.12<br>C = 51° 51' 26''84       |
|                                                                                                                     | d 27'76                                     | h 27'22  | h 28'04  | h 26'84  | l 27'00  | d 28'21  | l 25'78  | l 25'96  | l 25'40 | l 26'28  |                                                                  |
|                                                                                                                     | 27'84                                       | 26'62    | 27'93    | 26'78    | 26'31    | 28'27    | 25'80    | 26'87    | 24'86   | 27'12    |                                                                  |
| At XVII                                                                                                             |                                             |          |          |          |          |          |          |          |         |          |                                                                  |
| <i>December 1849 and January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |          |          |          |          |          |          |          |         |          |                                                                  |
| Angle between                                                                                                       | Circle readings, telescope being set on XIX |          |          |          |          |          |          |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                                     | 140° 20'                                    | 320° 20' | 147° 31' | 327° 31' | 154° 43' | 334° 43' | 161° 55' | 341° 55' | 169° 7' | 349° 7'  |                                                                  |
| XIX & XX                                                                                                            | "                                           | "        | "        | "        | "        | "        | "        | "        | "       | "        | M = 56''93<br>w = 4.20<br>1/w = 0.24<br>C = 55° 32' 56''93       |
|                                                                                                                     | h 57'80                                     | h 56'34  | h 57'54  | h 58'32  | h 55'88  | l 59'54  | l 59'54  | h 53'76  | h 55'70 | h 54'94  |                                                                  |
|                                                                                                                     | h 57'24                                     | h 58'00  | h 57'82  | h 57'30  | h 56'58  | l 59'80  | h 54'24  | h 56'10  | h 56'46 | h 55'74  |                                                                  |
|                                                                                                                     | 57'52                                       | 57'17    | 57'68    | 57'81    | 56'23    | 59'67    | 56'89    | 54'93    | 56'08   | 55'34    |                                                                  |

## At XVII—(Continued.)

December 1849 and January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between                                                                                                | Circle readings, telescope being set on XIX |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle     |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------|
|                                                                                                              | 140° 20'                                    | 320° 20' | 147° 31' | 327° 31' | 154° 43' | 334° 43' | 161° 55' | 341° 55' | 169° 7'  | 349° 7'  |                                                                      |
| XX & XVIII                                                                                                   | l 16°16'                                    | l 12°22' | l 12°94' | l 13°36' | h 14°34' | h 15°24' | h 15°22' | h 15°12' | h 13°44' | h 15°60' | M = 14''40<br>w = 7°00<br>$\frac{1}{w}$ = 0°14<br>C = 58° 11' 14''40 |
|                                                                                                              | l 14°60'                                    | l 12°72' | l 14°00' | l 14°74' | h 14°26' | h 14°60' | h 14°64' | h 16°04' | l 12°54' | h 16°24' |                                                                      |
|                                                                                                              | 15°38'                                      | 12°47'   | 13°47'   | 14°05'   | 14°30'   | 14°92'   | 14°93'   | 15°58'   | 12°99'   | 15°92'   |                                                                      |
| XVIII & XVI                                                                                                  | l 8°68'                                     | l 7°92'  | l 5°06'  | l 6°52'  | l 8°24'  | l 6°20'  | h 9°66'  | h 7°88'  | l 8°02'  | h 6°72'  | M = 7''49<br>w = 7°60<br>$\frac{1}{w}$ = 0°13<br>C = 48° 14' 7''49   |
|                                                                                                              | l 8°42'                                     | l 7°08'  | l 7°62'  | l 6°70'  | l 8°12'  | l 5°20'  | h 8°34'  | h 7°26'  | l 8°98'  | h 7°26'  |                                                                      |
|                                                                                                              | 8°55'                                       | 7°50'    | 6°34'    | 6°61'    | 8°18'    | 5°70'    | 9°00'    | 7°57'    | 8°50'    | 6°99'    |                                                                      |
| XVI & XV                                                                                                     | l 62°10'                                    | l 63°64' | l 66°26' | l 64°20' | l 64°10' | l 65°40' | h 61°78' | l 63°22' | l 62°50' | h 63°68' | M = 3''59<br>w = 10°68<br>$\frac{1}{w}$ = 0°09<br>C = 57° 43' 3''60  |
|                                                                                                              | l 62°94'                                    | l 63°76' | l 63°94' | l 63°46' | l 63°08' | l 64°92' | h 63°38' | l 63°06' | l 62°56' | h 63°10' |                                                                      |
|                                                                                                              |                                             |          | l 64°36' |          |          |          | h 64°34' |          |          |          |                                                                      |
|                                                                                                              | 62°52'                                      | 63°70'   | 64°85'   | 63°83'   | 63°59'   | 65°16'   | 63°17'   | 63°14'   | 62°53'   | 63°39'   |                                                                      |
| At XVIII                                                                                                     |                                             |          |          |          |          |          |          |          |          |          |                                                                      |
| November 1849 and January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                             |          |          |          |          |          |          |          |          |          |                                                                      |
| Angle between                                                                                                | Circle readings, telescope being set on XVI |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle     |
|                                                                                                              | 0° 1'                                       | 180° 1'  | 7° 18'   | 187° 18' | 14° 24'  | 194° 25' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                      |
| XVI & XV                                                                                                     | l 23°94'                                    | l 25°56' | l 26°96' | l 26°34' | h 27°44' | l 27°42' | l 26°76' | l 24°88' | l 25°08' | l 27°60' | M = 26''24<br>w = 9°10<br>$\frac{1}{w}$ = 0°11<br>C = 48° 43' 26''24 |
|                                                                                                              | l 25°04'                                    | l 25°94' | l 27°74' | l 25°64' | h 26°24' | l 26°80' | l 26°32' | l 24°82' | l 27°40' | l 26°80' |                                                                      |
|                                                                                                              | 24°49'                                      | 25°75'   | 27°35'   | 25°99'   | 26°84'   | 27°11'   | 26°54'   | 24°85'   | 26°24'   | 27°20'   |                                                                      |
| XV & XVII                                                                                                    | l 62°24'                                    | l 62°46' | l 60°58' | l 60°30' | h 61°90' | l 61°64' | l 63°66' | l 63°14' | l 62°20' | l 60°76' | M = 1''77<br>w = 13°20<br>$\frac{1}{w}$ = 0°08<br>C = 31° 11' 1''77  |
|                                                                                                              | l 61°56'                                    | l 60°36' | l 61°40' | l 60°88' | h 61°68' | l 62°00' | l 62°86' | l 62°48' | l 61°80' | l 61°42' |                                                                      |
|                                                                                                              | 61°90'                                      | 61°41'   | 60°99'   | 60°59'   | 61°79'   | 61°82'   | 63°26'   | 62°81'   | 62°00'   | 61°09'   |                                                                      |

| At XVIII—(Continued.)                                                                                               |                                             |                |                |                |                |                |                |                |                |                |                                                                        |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------------------------------------------------------------|
| <i>November 1849 and January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                |                |                                                                        |
| Angle between                                                                                                       | Circle readings, telescope being set on XVI |                |                |                |                |                |                |                |                |                | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle |
|                                                                                                                     | 0° 1'                                       | 180° 1'        | 7° 18'         | 187° 18'       | 14° 24'        | 194° 25'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                        |
| XVII & XIX                                                                                                          | "                                           | "              | "              | "              | "              | "              | "              | "              | "              | "              | $M = 32''\cdot77$                                                      |
|                                                                                                                     | <i>h</i> 32'74                              | <i>h</i> 33'26 | <i>h</i> 31'62 | <i>h</i> 31'94 | <i>l</i> 31'30 | <i>l</i> 31'82 | <i>l</i> 31'20 | <i>l</i> 33'06 | <i>l</i> 34'44 | <i>l</i> 35'52 | $w = 7\cdot40$                                                         |
|                                                                                                                     | <i>h</i> 33'32                              | <i>h</i> 33'60 | <i>h</i> 33'36 | <i>l</i> 31'72 | <i>l</i> 32'04 | <i>l</i> 33'02 | <i>l</i> 31'86 | <i>l</i> 32'20 | <i>l</i> 32'36 | <i>l</i> 34'96 | $\frac{1}{w} = 0\cdot14$                                               |
|                                                                                                                     | 33'03                                       | 33'43          | 32'49          | 31'83          | 31'67          | 32'42          | 31'53          | 32'63          | 33'40          | 35'24          | $C = 26^{\circ}24'32''\cdot77$                                         |
| XIX & XX                                                                                                            | <i>h</i> 40'92                              | <i>h</i> 44'32 | <i>h</i> 44'60 | <i>l</i> 44'88 | <i>l</i> 45'72 | <i>l</i> 46'04 | <i>l</i> 44'48 | <i>l</i> 44'78 | <i>l</i> 43'80 | <i>l</i> 43'12 | $M = 44''\cdot53$                                                      |
|                                                                                                                     | <i>h</i> 41'74                              | <i>h</i> 44'20 | <i>h</i> 45'50 | <i>l</i> 45'44 | <i>l</i> 45'54 | <i>l</i> 44'96 | <i>l</i> 46'24 | <i>l</i> 45'54 | <i>l</i> 45'74 | <i>l</i> 43'02 | $w = 5\cdot10$                                                         |
|                                                                                                                     |                                             |                |                |                |                |                |                |                |                |                | $\frac{1}{w} = 0\cdot20$                                               |
|                                                                                                                     | 41'33                                       | 44'26          | 45'05          | 45'16          | 45'63          | 45'50          | 45'36          | 45'16          | 44'77          | 43'07          | $C = 41^{\circ}54'44''\cdot53$                                         |
| At XIX                                                                                                              |                                             |                |                |                |                |                |                |                |                |                |                                                                        |
| <i>January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                   |                                             |                |                |                |                |                |                |                |                |                |                                                                        |
| Angle between                                                                                                       | Circle readings, telescope being set on XXI |                |                |                |                |                |                |                |                |                | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle |
|                                                                                                                     | 199° 23'                                    | 19° 23'        | 200° 35'       | 26° 35'        | 213° 46'       | 33° 46'        | 220° 58'       | 40° 58'        | 228° 10'       | 48° 10'        |                                                                        |
| XXI & XXII                                                                                                          | "                                           | "              | "              | "              | "              | "              | "              | "              | "              | "              | $M = 7''\cdot87$                                                       |
|                                                                                                                     | <i>h</i> 6'88                               | <i>h</i> 9'40  | <i>l</i> 9'14  | <i>l</i> 7'60  | <i>l</i> 7'92  | <i>h</i> 5'76  | <i>h</i> 5'80  | <i>h</i> 7'08  | <i>h</i> 7'76  | <i>l</i> 8'42  | $w = 6\cdot80$                                                         |
|                                                                                                                     | <i>h</i> 9'12                               | <i>h</i> 9'18  | <i>l</i> 9'26  | <i>l</i> 7'86  | <i>h</i> 9'00  | <i>h</i> 6'64  | <i>h</i> 5'92  | <i>h</i> 7'16  | <i>h</i> 8'58  | <i>l</i> 8'82  | $\frac{1}{w} = 0\cdot15$                                               |
|                                                                                                                     | 8'00                                        | 9'29           | 9'20           | 7'73           | 8'46           | 6'20           | 5'86           | 7'12           | 8'17           | 8'62           | $C = 47^{\circ}34'7''\cdot87$                                          |
| XXII & XX                                                                                                           | <i>l</i> 10'68                              | <i>l</i> 12'18 | <i>l</i> 10'04 | <i>l</i> 10'96 | <i>l</i> 9'88  | <i>h</i> 10'76 | <i>h</i> 10'02 | <i>h</i> 10'54 | <i>h</i> 11'18 | <i>l</i> 11'46 | $M = 10''\cdot63$                                                      |
|                                                                                                                     | <i>l</i> 10'68                              | <i>l</i> 10'92 | <i>l</i> 9'60  | <i>l</i> 11'40 | <i>h</i> 8'54  | <i>h</i> 10'40 | <i>h</i> 10'76 | <i>h</i> 10'64 | <i>h</i> 11'62 | <i>l</i> 10'38 | $w = 16\cdot90$                                                        |
|                                                                                                                     |                                             |                |                |                |                |                |                |                |                |                | $\frac{1}{w} = 0\cdot06$                                               |
|                                                                                                                     | 10'68                                       | 11'55          | 9'82           | 11'18          | 9'21           | 10'58          | 10'39          | 10'59          | 11'40          | 10'92          | $C = 25^{\circ}28'10''\cdot63$                                         |



## At XIX—(Continued.)

January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XXI |           |           |           |           |           |           |           |           |           | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle       |
|---------------|---------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------------------------------------------------|
|               | 199° 23'                                    | 19° 23'   | 206° 35'  | 26° 35'   | 213° 46'  | 33° 46'   | 220° 58'  | 40° 58'   | 228° 10'  | 48° 10'   |                                                                        |
| XX & XVIII    | l 28° 80'                                   | l 29° 38' | l 31° 24' | l 31° 38' | l 31° 78' | h 30° 88' | h 31° 64' | h 30° 88' | h 33° 62' | l 30° 64' | M = 31° 13'<br>w = 8.30<br>$\frac{1}{w}$ = 0.12<br>C = 47° 44' 31" 13  |
|               | l 30° 16'                                   | l 30° 16' | l 31° 84' | l 30° 22' | h 31° 94' | h 30° 62' | h 32° 26' | h 30° 46' | h 32° 06' | l 32° 58' |                                                                        |
|               | 29° 48'                                     | 29° 77'   | 31° 54'   | 30° 80'   | 31° 86'   | 30° 75'   | 31° 95'   | 30° 67'   | 32° 84'   | 31° 61'   |                                                                        |
| XVIII & XVII  | l 19° 76'                                   | l 20° 54' | l 18° 74' | l 17° 56' | l 17° 22' | h 17° 26' | h 18° 44' | h 18° 84' | h 17° 30' | l 18° 36' | M = 18° 34'<br>w = 10.50<br>$\frac{1}{w}$ = 0.10<br>C = 39° 51' 18" 34 |
|               | l 19° 96'                                   | l 18° 88' | l 17° 94' | l 19° 16' | h 18° 16' | h 17° 96' | h 17° 28' | h 19° 02' | h 17° 50' | l 16° 82' |                                                                        |
|               | 19° 86'                                     | 19° 71'   | 18° 34'   | 18° 36'   | 17° 69'   | 17° 61'   | 17° 86'   | 18° 93'   | 17° 40'   | 17° 59'   |                                                                        |

## At XX

November 1849 and January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XVIII |           |           |           |           |           |           |           |           |           | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle      |
|---------------|-----------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------------------------------------------------------------------|
|               | 68° 22'                                       | 248° 22'  | 75° 33'   | 255° 33'  | 82° 45'   | 262° 45'  | 89° 57'   | 269° 57'  | 97° 9'    | 277° 9'   |                                                                       |
| XVIII & XVII  | h 29° 34'                                     | h 31° 18' | l 29° 66' | l 28° 98' | l 28° 40' | l 27° 00' | l 28° 32' | l 27° 20' | l 27° 30' | l 26° 62' | M = 28° 52'<br>w = 6.30<br>$\frac{1}{w}$ = 0.16<br>C = 53° 29' 28" 52 |
|               | h 31° 02'                                     | h 29° 08' | l 29° 98' | l 28° 68' | l 28° 08' | l 27° 80' | l 29° 12' | l 27° 58' | l 27° 40' | l 27° 70' |                                                                       |
|               | 30° 18'                                       | 30° 13'   | 29° 82'   | 28° 83'   | 28° 24'   | 27° 40'   | 28° 72'   | 27° 39'   | 27° 35'   | 27° 16'   |                                                                       |
| XVII & XIX    | d 16° 15'                                     | d 12° 00' | d 17° 64' | d 18° 98' | d 18° 24' | d 19° 76' | d 17° 37' | d 18° 46' | d 18° 66' | d 18° 31' | M = 17° 39'<br>w = 4.32<br>$\frac{1}{w}$ = 0.23<br>C = 36° 51' 17" 38 |
|               | d 16° 65'                                     | d 14° 78' | d 17° 64' | d 17° 40' | d 17° 60' | d 19° 20' | d 16° 87' | d 18° 22' | d 16° 00' | d 16° 39' |                                                                       |
|               | d 15° 74'                                     |           |           |           |           |           |           |           |           |           |                                                                       |
|               | 16° 40'                                       | 14° 17'   | 17° 64'   | 18° 19'   | 17° 92'   | 19° 48'   | 17° 12'   | 18° 34'   | 17° 33'   | 17° 35'   |                                                                       |

| At XX—(Continued.)                                                                                                  |                                              |                |                |                |                |                |                |                |                |                |                                                                                            |
|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------------------------------------------------------------------------|
| <i>November 1849 and January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle between                                                                                                       | Circle readings, telescope being set on XIX  |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                     | 158° 43'                                     | 388° 43'       | 165° 54'       | 345° 54'       | 173° 6'        | 353° 6'        | 180° 18'       | 0° 18'         | 187° 30'       | 7° 30'         |                                                                                            |
| XIX & XXI                                                                                                           | "                                            | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 37''09<br><i>w</i> = 5 30<br>$\frac{1}{w}$ = 0.19<br><i>C</i> = 59° 9' 37''09   |
|                                                                                                                     | <i>d</i> 39'88                               | <i>h</i> 39'84 | <i>l</i> 35'76 | <i>l</i> 35'74 | <i>l</i> 35'52 | <i>l</i> 37'04 | <i>l</i> 35'74 | <i>l</i> 35'20 | <i>l</i> 36'00 | <i>l</i> 35'64 |                                                                                            |
|                                                                                                                     | <i>d</i> 38'94                               | <i>l</i> 38'68 | <i>l</i> 36'68 | <i>l</i> 36'68 | <i>l</i> 36'90 | <i>l</i> 37'06 | <i>l</i> 37'84 | <i>l</i> 37'52 | <i>l</i> 38'60 | <i>l</i> 36'58 |                                                                                            |
|                                                                                                                     | 39'41                                        | 39'26          | 36'22          | 36'21          | 36'21          | 37'05          | 36'79          | 36'36          | 37'30          | 36'11          |                                                                                            |
| XXI & XXII                                                                                                          | <i>d</i> 45'43                               | <i>h</i> 45'40 | <i>l</i> 48'04 | <i>l</i> 47'56 | <i>l</i> 47'64 | <i>l</i> 46'82 | <i>l</i> 47'02 | <i>l</i> 48'80 | <i>l</i> 47'00 | <i>l</i> 46'52 | <i>M</i> = 46''86<br><i>w</i> = 13 08<br>$\frac{1}{w}$ = 0.08<br><i>C</i> = 55° 40' 46''86 |
|                                                                                                                     | <i>d</i> 45'07                               | <i>d</i> 46'39 | <i>l</i> 47'26 | <i>l</i> 48'14 | <i>l</i> 45'52 | <i>l</i> 47'72 | <i>l</i> 46'12 | <i>l</i> 46'84 | <i>l</i> 46'48 | <i>l</i> 46'70 |                                                                                            |
|                                                                                                                     | <i>d</i> 45'85                               | <i>d</i> 47'09 | <i>d</i> 45'49 | <i>d</i> 44'85 | <i>d</i> 46'16 | <i>d</i> 47'68 | <i>d</i> 47'56 | <i>d</i> 48'12 | <i>d</i> 46'61 | <i>d</i> 48'34 |                                                                                            |
|                                                                                                                     | <i>d</i> 46'77                               |                | <i>d</i> 44'91 | <i>d</i> 45'15 | <i>d</i> 46'38 | <i>d</i> 47'36 | <i>d</i> 48'26 | <i>d</i> 49'98 | <i>d</i> 47'43 | <i>d</i> 47'34 |                                                                                            |
|                                                                                                                     | 45'78                                        | 46'29          | 46'43          | 46'43          | 46'43          | 47'40          | 47'24          | 48'44          | 46'88          | 47'23          |                                                                                            |
| At XXI                                                                                                              |                                              |                |                |                |                |                |                |                |                |                |                                                                                            |
| <i>January 1850, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i>   |                                              |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle between                                                                                                       | Circle readings, telescope being set on XXIV |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                     | 0° 1'                                        | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 49'        | 208° 49'       |                                                                                            |
| XXIV & XXIII                                                                                                        | "                                            | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 5''41<br><i>w</i> = 10 30<br>$\frac{1}{w}$ = 0.10<br><i>C</i> = 74° 13' 5''41   |
|                                                                                                                     | <i>h</i> 7'30                                | <i>h</i> 7'14  | <i>h</i> 4'06  | <i>h</i> 5'00  | <i>l</i> 6'28  | <i>h</i> 6'00  | <i>l</i> 5'06  | <i>l</i> 5'08  | <i>h</i> 6'62  | <i>h</i> 5'06  |                                                                                            |
|                                                                                                                     | <i>h</i> 5'62                                | <i>l</i> 6'60  | <i>h</i> 5'12  | <i>l</i> 3'84  | <i>h</i> 6'46  | <i>h</i> 5'26  | <i>l</i> 5'04  | <i>l</i> 4'14  | <i>h</i> 4'22  | <i>h</i> 4'36  |                                                                                            |
|                                                                                                                     | 6'46                                         | 6'87           | 4'59           | 4'42           | 6'37           | 5'63           | 5'05           | 4'61           | 5'42           | 4'71           |                                                                                            |
| XXIII & XXII                                                                                                        | <i>h</i> 3'98                                | <i>h</i> 3'26  | <i>h</i> 4'88  | <i>h</i> 3'58  | <i>l</i> 1'42  | <i>h</i> 4'66  | <i>l</i> 5'12  | <i>l</i> 5'30  | <i>h</i> 2'90  | <i>h</i> 3'54  | <i>M</i> = 4''03<br><i>w</i> = 11 10<br>$\frac{1}{w}$ = 0.09<br><i>C</i> = 55° 37' 4''03   |
|                                                                                                                     | <i>h</i> 3'68                                | <i>l</i> 2'74  | <i>h</i> 2'42  | <i>h</i> 3'16  | <i>h</i> 5'30  | <i>h</i> 5'18  | <i>l</i> 5'52  | <i>l</i> 4'26  | <i>h</i> 3'48  | <i>h</i> 4'68  |                                                                                            |
|                                                                                                                     |                                              |                | <i>l</i> 4'48  |                | <i>h</i> 4'68  |                |                |                |                |                |                                                                                            |
|                                                                                                                     | 3'83                                         | 3'00           | 3'93           | 3'37           | 3'80           | 4'92           | 5'32           | 4'78           | 3'19           | 4'11           |                                                                                            |

At XXI—(Continued.)

January 1850, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XXIV |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|---------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------------------------------|
|               | 0° 1'                                        | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 49'  | 206° 49' |                                                                                              |
| XXII & XX     | h 19° 64                                     | h 20° 08 | h 19° 26 | h 21° 40 | l 22° 66 | h 20° 12 | l 20° 08 | l 18° 78 | h 20° 50 | h 21° 16 | <i>M</i> = 20'' 26<br><i>w</i> = 19 00<br>$\frac{1}{w}$ = 0 05<br><i>C</i> = 31° 23' 20'' 26 |
|               | h 19° 92                                     | l 19° 82 | h 21° 62 | h 21° 10 | h 19° 16 | h 20° 18 | l 19° 84 | l 20° 64 | h 19° 86 | h 20° 64 |                                                                                              |
|               | 19° 78                                       | 19° 95   | 20° 08   | 21° 25   | 20° 65   | 20° 15   | 19° 96   | 19° 71   | 20° 18   | 20° 90   |                                                                                              |
| XX & XIX      | h 5° 88                                      | l 6° 52  | h 6° 68  | l 7° 18  | l 6° 56  | h 6° 50  | l 4° 88  | l 6° 54  | h 6° 96  | h 7° 08  | <i>M</i> = 6'' 68<br><i>w</i> = 35 70<br>$\frac{1}{w}$ = 0 03<br><i>C</i> = 47° 48' 6'' 68   |
|               | h 6° 68                                      | l 6° 16  | h 6° 74  | l 6° 08  | h 7° 20  | h 7° 04  | l 7° 60  | l 6° 36  | h 7° 50  | h 7° 48  |                                                                                              |
|               | 6° 28                                        | 6° 34    | 6° 71    | 6° 63    | 6° 88    | 6° 77    | 6° 24    | 6° 45    | 7° 23    | 7° 28    |                                                                                              |

At XXII

February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XX |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|---------------|--------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------------------------------|
|               | 0° 0'                                      | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 25' | 21° 37'  | 201° 37' | 28° 48'  | 206° 48' |                                                                                              |
| XX & XIX      | h 26° 64                                   | h 24° 84 | l 23° 62 | l 24° 70 | l 25° 22 | l 24° 32 | l 25° 66 | l 25° 14 | l 22° 66 | l 26° 98 | <i>M</i> = 24'' 90<br><i>w</i> = 8 77<br>$\frac{1}{w}$ = 0 11<br><i>C</i> = 39° 41' 24'' 90  |
|               | h 24° 90                                   | h 23° 98 | l 23° 80 | l 22° 78 | l 25° 96 | l 23° 86 | l 25° 90 | l 24° 94 | l 24° 96 | l 25° 78 |                                                                                              |
|               | 25° 77                                     | 24° 41   | 23° 71   | 23° 74   | 25° 59   | 24° 09   | 25° 78   | 25° 04   | 24° 50   | 26° 38   |                                                                                              |
| XIX & XXI     | h 30° 54                                   | h 29° 56 | l 29° 58 | l 28° 54 | l 29° 16 | l 30° 46 | l 29° 32 | l 29° 16 | l 30° 72 | l 29° 22 | <i>M</i> = 29'' 36<br><i>w</i> = 33 30<br>$\frac{1}{w}$ = 0 03<br><i>C</i> = 53° 14' 29'' 36 |
|               | h 29° 56                                   | h 28° 86 | l 29° 50 | l 29° 56 | l 29° 34 | l 29° 20 | l 28° 68 | l 29° 08 | l 28° 90 | l 28° 30 |                                                                                              |
|               | 30° 05                                     | 29° 21   | 29° 54   | 29° 05   | 29° 25   | 29° 83   | 29° 00   | 29° 12   | 29° 81   | 28° 76   |                                                                                              |

At XXII—(Continued.)

February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XX |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|---------------|--------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------------------------------------------------------------|
|               | 0° 0'                                      | 180° 1'         | 7° 13'          | 187° 13'        | 14° 24'         | 194° 25'        | 21° 37'         | 201° 37'        | 28° 48'         | 208° 48'        |                                                                                             |
| XXI & XXIII   | <i>h</i> 46° 66                            | <i>h</i> 47° 98 | <i>l</i> 52° 28 | <i>l</i> 49° 38 | <i>l</i> 48° 04 | <i>l</i> 48° 76 | <i>l</i> 47° 08 | <i>l</i> 47° 54 | <i>l</i> 50° 22 | <i>l</i> 47° 04 | <i>M</i> = 48''·52<br><i>w</i> = 3·90<br>$\frac{1}{w}$ = 0·26<br><i>C</i> = 46° 37' 48''·52 |
|               | <i>h</i> 47° 44                            | <i>h</i> 49° 24 | <i>l</i> 50° 80 | <i>l</i> 49° 16 | <i>l</i> 47° 60 | <i>l</i> 47° 58 | <i>l</i> 45° 90 | <i>l</i> 48° 66 | <i>l</i> 50° 92 | <i>l</i> 48° 12 |                                                                                             |
|               | 47° 05                                     | 48° 61          | 51° 54          | 49° 27          | 47° 82          | 48° 17          | 46° 49          | 48° 10          | 50° 57          | 47° 58          |                                                                                             |
| XXIII & XXVI  | <i>l</i> 14° 74                            | <i>l</i> 13° 78 | <i>l</i> 10° 44 | <i>l</i> 11° 00 | <i>l</i> 12° 96 | <i>l</i> 12° 08 | <i>l</i> 14° 30 | <i>l</i> 14° 84 | <i>l</i> 9° 76  | <i>l</i> 13° 60 | <i>M</i> = 12''·84<br><i>w</i> = 3·00<br>$\frac{1}{w}$ = 0·33<br><i>C</i> = 43° 37' 12''·84 |
|               | <i>l</i> 15° 34                            | <i>l</i> 12° 84 | <i>l</i> 11° 80 | <i>l</i> 11° 88 | <i>l</i> 12° 32 | <i>l</i> 12° 32 | <i>l</i> 15° 46 | <i>l</i> 14° 08 | <i>l</i> 9° 26  | <i>l</i> 13° 96 |                                                                                             |
|               | 15° 04                                     | 13° 31          | 11° 12          | 11° 44          | 12° 64          | 12° 20          | 14° 88          | 14° 46          | 9° 51           | 13° 78          |                                                                                             |

At XXIII

February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XXII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|---------------|----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------------------------------------------------------------|
|               | 0° 1'                                        | 180° 1'         | 7° 13'          | 187° 13'        | 14° 24'         | 194° 24'        | 21° 36'         | 201° 36'        | 28° 48'         | 208° 48'        |                                                                                             |
| R M & XXI     | <i>h</i> 45° 56                              | <i>l</i> 44° 72 | <i>l</i> 45° 38 | <i>h</i> 46° 28 | <i>l</i> 48° 48 | <i>h</i> 47° 30 | <i>l</i> 45° 56 | <i>l</i> 42° 78 | <i>h</i> 45° 12 | <i>h</i> 46° 30 | <i>M</i> = 45''·50<br><i>w</i> = 7·81<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 64° 45' 45''·50 |
|               | <i>h</i> 44° 54                              | <i>l</i> 45° 50 | <i>l</i> 44° 88 | <i>l</i> 45° 72 | <i>h</i> 45° 52 | <i>h</i> 46° 74 | <i>l</i> 47° 64 | <i>l</i> 44° 72 | <i>h</i> 45° 02 | <i>h</i> 43° 86 |                                                                                             |
|               | <i>d</i> 44° 75                              | <i>d</i> 45° 22 | <i>d</i> 44° 54 | <i>d</i> 45° 99 | <i>d</i> 45° 46 |                 | <i>l</i> 46° 70 | <i>d</i> 43° 90 |                 | <i>d</i> 44° 06 |                                                                                             |
|               | 44° 95                                       | 45° 15          | 44° 93          | 46° 00          | 46° 49          | 47° 02          | 46° 84          | 43° 80          | 45° 07          | 44° 74          |                                                                                             |
| XXII & XXI    | <i>h</i> 7° 72                               | <i>l</i> 7° 20  | <i>l</i> 6° 66  | <i>h</i> 7° 28  | <i>l</i> 7° 14  | <i>h</i> 7° 56  | <i>l</i> 7° 00  | <i>l</i> 9° 38  | <i>h</i> 8° 36  | <i>h</i> 9° 54  | <i>M</i> = 7''·79<br><i>w</i> = 9·25<br>$\frac{1}{w}$ = 0·11<br><i>C</i> = 77° 45' 7''·80   |
|               | <i>h</i> 5° 92                               | <i>l</i> 9° 36  | <i>l</i> 6° 72  | <i>l</i> 6° 06  | <i>h</i> 8° 28  | <i>h</i> 8° 02  | <i>l</i> 7° 34  | <i>l</i> 7° 98  | <i>h</i> 8° 90  | <i>h</i> 9° 58  |                                                                                             |
|               | 6° 82                                        | 8° 28           | 6° 69           | 6° 67           | 7° 71           | 7° 79           | 7° 17           | 8° 68           | 8° 63           | 9° 44           |                                                                                             |

At XXIII—(Continued.)

February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on R M |         |         |          |         |          |         |          |         |          |   | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|---------------|---------------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|----------|---|----------------------------------------------------------------------------------------------|
|               | 0° 1'                                       | 180° 1' | 7° 12'  | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |   |                                                                                              |
| XXI & XXIV    | "                                           | "       | "       | "        | "       | "        | "       | "        | "       | "        | " | <i>M</i> = 42''·47<br><i>w</i> = 9·39<br>$\frac{1}{w}$ = 0·11<br><i>C</i> = 42° 9' 42''·46   |
|               | h 44°04                                     | l 43°00 | l 43°82 | h 43°54  | l 41°22 | h 42°20  | l 42°98 | l 39°66  | h 41°32 | h 42°24  |   |                                                                                              |
|               | h 43°82                                     | l 41°82 | l 43°10 | l 42°00  | h 40°70 | h 41°86  | l 43°48 | l 41°98  | h 42°86 | d 41°88  |   |                                                                                              |
|               |                                             |         |         |          |         |          | d 43°56 |          |         |          |   |                                                                                              |
|               | 43°93                                       | 42°41   | 43°46   | 42°77    | 40°96   | 42°03    | 43°23   | 41°73    | 42°09   | 42°06    |   |                                                                                              |
| XXIV & XXV    | h 20°26                                     | l 21°60 | l 23°48 | h 20°62  | l 22°20 | h 22°10  | l 20°26 | l 20°14  | h 23°72 | l 20°80  |   | <i>M</i> = 21''·57<br><i>w</i> = 4·97<br>$\frac{1}{w}$ = 0·20<br><i>C</i> = 51° 18' 21''·56  |
|               | h 20°48                                     | l 22°62 | l 22°90 | l 22°14  | h 24°26 | h 21°90  | l 18°52 | l 18°90  | h 21°92 | l 21°28  |   |                                                                                              |
|               |                                             |         |         |          |         |          | d 22°26 |          | d 20°06 | d 20°86  |   |                                                                                              |
|               | 20°37                                       | 22°11   | 23°19   | 21°38    | 23°23   | 22°00    | 19°39   | 20°43    | 22°82   | 20°75    |   |                                                                                              |
| XXV & XXVI    | h 18°90                                     | l 20°94 | l 16°90 | h 18°66  | l 14°10 | h 17°98  | l 19°94 | l 19°96  | h 16°84 | l 19°34  |   | <i>M</i> = 18''·68<br><i>w</i> = 3·72<br>$\frac{1}{w}$ = 0·27<br><i>C</i> = 101° 52' 18''·67 |
|               | h 19°64                                     | l 20°28 | l 17°70 | l 19°48  | h 14°98 | h 20°08  | l 20°50 | l 19°98  | h 17°46 | l 18°62  |   |                                                                                              |
|               |                                             |         |         | l 17°18  | l 15°72 |          |         |          | d 18°00 | d 18°80  |   |                                                                                              |

| At XXIV                                                                                            |                                               |                |                |                |                |                |                |                |                |                |                                                                                            |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------------------------------------------------------------------------|
| <i>January 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>  |                                               |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle between                                                                                      | Circle readings, telescope being set on XXV   |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                    | 0° 1'                                         | 180° 1'        | 7° 12'         | 187° 13'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 37'       | 28° 48'        | 208° 45'       |                                                                                            |
| XXV & XXIII                                                                                        | "                                             | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 44''30<br><i>w</i> = 23.90<br>$\frac{1}{w}$ = 0.04<br><i>C</i> = 58' 42' 44''30 |
|                                                                                                    | <i>h</i> 43'50                                | <i>h</i> 45'52 | <i>h</i> 44'04 | <i>h</i> 43'58 | <i>l</i> 44'32 | <i>l</i> 45'36 | <i>l</i> 44'50 | <i>l</i> 43'78 | <i>l</i> 44'74 | <i>l</i> 43'92 |                                                                                            |
|                                                                                                    | <i>h</i> 43'68                                | <i>h</i> 43'20 | <i>h</i> 43'10 | <i>h</i> 44'30 | <i>l</i> 44'24 | <i>l</i> 45'62 | <i>l</i> 44'28 | <i>l</i> 45'16 | <i>l</i> 44'74 | <i>l</i> 44'50 |                                                                                            |
|                                                                                                    | 43'59                                         | 44'36          | 43'57          | 43'94          | 44'28          | 45'49          | 44'39          | 44'47          | 44'74          | 44'21          |                                                                                            |
| XXIII & XXI                                                                                        | <i>h</i> 14'48                                | <i>h</i> 13'48 | <i>h</i> 15'02 | <i>h</i> 13'98 | <i>l</i> 14'90 | <i>l</i> 13'70 | <i>l</i> 13'92 | <i>l</i> 15'86 | <i>l</i> 14'38 | <i>l</i> 14'42 | <i>M</i> = 14''40<br><i>w</i> = 20.40<br>$\frac{1}{w}$ = 0.05<br><i>C</i> = 63° 37' 14''40 |
|                                                                                                    | <i>h</i> 13'90                                | <i>h</i> 14'06 | <i>h</i> 15'66 | <i>h</i> 13'36 | <i>l</i> 14'74 | <i>l</i> 14'16 | <i>l</i> 13'90 | <i>l</i> 15'48 | <i>l</i> 14'48 | <i>l</i> 14'16 |                                                                                            |
|                                                                                                    | 14'19                                         | 13'77          | 15'34          | 13'67          | 14'82          | 13'93          | 13'91          | 15'67          | 14'43          | 14'29          |                                                                                            |
| At XXV                                                                                             |                                               |                |                |                |                |                |                |                |                |                |                                                                                            |
| <i>February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle between                                                                                      | Circle readings, telescope being set on XXVII |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                    | 0° 1'                                         | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                            |
| XXVII & XXVIII                                                                                     | "                                             | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 60''10<br><i>w</i> = 8.50<br>$\frac{1}{w}$ = 0.12<br><i>C</i> = 43° 44' 60''10  |
|                                                                                                    | <i>l</i> 59'64                                | <i>l</i> 59'10 | <i>l</i> 59'32 | <i>l</i> 59'06 | <i>l</i> 59'24 | <i>l</i> 59'06 | <i>h</i> 62'10 | <i>h</i> 61'60 | <i>l</i> 60'42 | <i>l</i> 59'48 |                                                                                            |
|                                                                                                    | <i>l</i> 60'40                                | <i>l</i> 60'00 | <i>l</i> 58'62 | <i>l</i> 59'96 | <i>l</i> 58'22 | <i>l</i> 61'18 | <i>h</i> 60'98 | <i>h</i> 60'80 | <i>l</i> 62'32 | <i>l</i> 60'54 |                                                                                            |
|                                                                                                    | 60'02                                         | 59'55          | 58'97          | 59'51          | 58'73          | 60'12          | 61'54          | 61'20          | 61'37          | 60'01          |                                                                                            |
| XXVIII & XXVI                                                                                      | <i>l</i> 12'46                                | <i>l</i> 11'20 | <i>l</i> 13'88 | <i>l</i> 12'16 | <i>l</i> 11'70 | <i>l</i> 11'48 | <i>h</i> 10'44 | <i>h</i> 11'30 | <i>l</i> 12'50 | <i>l</i> 12'38 | <i>M</i> = 11''89<br><i>w</i> = 12.80<br>$\frac{1}{w}$ = 0.08<br><i>C</i> = 42° 0' 11''89  |
|                                                                                                    | <i>l</i> 11'26                                | <i>l</i> 11'48 | <i>l</i> 13'28 | <i>l</i> 11'96 | <i>l</i> 13'08 | <i>l</i> 10'50 | <i>h</i> 11'12 | <i>h</i> 11'46 | <i>l</i> 11'46 | <i>l</i> 12'76 |                                                                                            |
|                                                                                                    | 11'86                                         | 11'34          | 13'58          | 12'06          | 12'39          | 10'99          | 10'78          | 11'38          | 11'98          | 12'57          |                                                                                            |
| XXVI & XXIII                                                                                       | <i>h</i> 10'64                                | <i>h</i> 11'72 | <i>l</i> 10'78 | <i>l</i> 13'16 | <i>l</i> 11'78 | <i>l</i> 11'32 | <i>h</i> 13'10 | <i>h</i> 13'34 | <i>l</i> 11'92 | <i>l</i> 10'80 | <i>M</i> = 11''68<br><i>w</i> = 10.60<br>$\frac{1}{w}$ = 0.09<br><i>C</i> = 40° 18' 11''68 |
|                                                                                                    | <i>h</i> 11'06                                | <i>h</i> 13'50 | <i>l</i> 11'96 | <i>l</i> 10'44 | <i>l</i> 10'82 | <i>l</i> 12'20 | <i>h</i> 12'28 | <i>h</i> 12'58 | <i>l</i> 10'12 | <i>l</i> 10'10 |                                                                                            |
|                                                                                                    | 10'85                                         | 12'61          | 11'37          | 11'83          | 11'30          | 11'76          | 12'69          | 12'96          | 11'02          | 10'45          |                                                                                            |

## At XXV—(Continued.)

February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between                                                                               | Circle readings, telescope being set on XXVII |                |                |                |                |                |                |                |                |                | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                             |
|---------------------------------------------------------------------------------------------|-----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------------------------------------------------------------------------------------|
|                                                                                             | 0° 1'                                         | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                                    |
| XXIII & XXIV                                                                                | "                                             | "              | "              | "              | "              | "              | "              | "              | "              | "              | $M = 56''\cdot36$<br>$w = 10\cdot60$<br>$\frac{1}{w} = 0\cdot09$<br>$C = 69^\circ 58' 56''\cdot36$ |
|                                                                                             | <i>h</i> 56'42                                | <i>h</i> 57'94 | <i>l</i> 57'22 | <i>l</i> 55'54 | <i>l</i> 55'40 | <i>l</i> 56'38 | <i>h</i> 55'42 | <i>h</i> 54'66 | <i>l</i> 56'56 | <i>l</i> 56'82 |                                                                                                    |
|                                                                                             | <i>h</i> 57'64                                | <i>h</i> 55'84 | <i>l</i> 56'28 | <i>l</i> 56'16 | <i>l</i> 56'24 | <i>l</i> 57'08 | <i>h</i> 55'02 | <i>h</i> 54'86 | <i>l</i> 57'98 | <i>l</i> 57'78 |                                                                                                    |
|                                                                                             | 57'03                                         | 56'89          | 56'75          | 55'85          | 55'82          | 56'73          | 55'22          | 54'76          | 57'27          | 57'30          |                                                                                                    |
| At XXVI                                                                                     |                                               |                |                |                |                |                |                |                |                |                |                                                                                                    |
| February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                               |                |                |                |                |                |                |                |                |                |                                                                                                    |
| Angle between                                                                               | Circle readings, telescope being set on XXII  |                |                |                |                |                |                |                |                |                | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                             |
|                                                                                             | 0° 1'                                         | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 37'       | 28° 48'        | 208° 48'       |                                                                                                    |
| XXII & XXIII                                                                                | "                                             | "              | "              | "              | "              | "              | "              | "              | "              | "              | $M = 17''\cdot77$<br>$w = 6\cdot24$<br>$\frac{1}{w} = 0\cdot16$<br>$C = 49^\circ 28' 17''\cdot76$  |
|                                                                                             | <i>l</i> 15'08                                | <i>l</i> 18'14 | <i>l</i> 18'84 | <i>l</i> 18'76 | <i>h</i> 18'20 | <i>h</i> 19'62 | <i>l</i> 16'24 | <i>l</i> 17'44 | <i>l</i> 16'78 | <i>l</i> 19'70 |                                                                                                    |
|                                                                                             | <i>l</i> 17'62                                | <i>l</i> 17'48 | <i>l</i> 18'14 | <i>l</i> 17'34 | <i>h</i> 16'44 | <i>h</i> 17'30 | <i>l</i> 15'28 | <i>l</i> 18'32 | <i>l</i> 18'32 | <i>l</i> 20'22 |                                                                                                    |
|                                                                                             | 16'44                                         | 17'81          | 18'49          | 18'05          | 17'32          | 18'46          | 15'76          | 17'88          | 17'55          | 19'96          |                                                                                                    |
| XXIII & XXV                                                                                 | <i>l</i> 34'22                                | <i>l</i> 30'42 | <i>l</i> 32'38 | <i>l</i> 31'46 | <i>h</i> 33'80 | <i>h</i> 32'92 | <i>l</i> 33'16 | <i>l</i> 31'24 | <i>l</i> 31'26 | <i>l</i> 30'24 | $M = 32''\cdot09$<br>$w = 4\cdot30$<br>$\frac{1}{w} = 0\cdot23$<br>$C = 37^\circ 49' 32''\cdot09$  |
|                                                                                             | <i>l</i> 33'46                                | <i>l</i> 31'44 | <i>l</i> 32'98 | <i>l</i> 31'38 | <i>h</i> 34'40 | <i>h</i> 31'98 | <i>l</i> 34'50 | <i>l</i> 30'02 | <i>l</i> 30'98 | <i>l</i> 29'62 |                                                                                                    |
|                                                                                             | 33'84                                         | 30'93          | 32'68          | 31'42          | 34'10          | 32'45          | 33'83          | 30'63          | 31'12          | 29'93          |                                                                                                    |
| XXV & XXVII                                                                                 | <i>l</i> 53'80                                | <i>l</i> 51'20 | <i>l</i> 51'60 | <i>l</i> 50'82 | <i>h</i> 51'46 | <i>h</i> 51'62 | <i>l</i> 51'06 | <i>l</i> 52'08 | <i>l</i> 52'78 | <i>l</i> 51'66 | $M = 51''\cdot90$<br>$w = 8\cdot60$<br>$\frac{1}{w} = 0\cdot12$<br>$C = 40^\circ 19' 51''\cdot90$  |
|                                                                                             | <i>l</i> 53'84                                | <i>l</i> 51'90 | <i>l</i> 50'68 | <i>l</i> 50'84 | <i>h</i> 51'24 | <i>h</i> 52'16 | <i>l</i> 50'54 | <i>l</i> 52'18 | <i>l</i> 51'72 | <i>l</i> 54'74 |                                                                                                    |
|                                                                                             | 53'82                                         | 51'55          | 51'14          | 50'83          | 51'35          | 51'89          | 50'80          | 52'13          | 52'25          | 53'20          |                                                                                                    |
| XXVII & XXVIII                                                                              | <i>l</i> 2'76                                 | <i>l</i> 4'22  | <i>l</i> 2'72  | <i>l</i> 3'02  | <i>h</i> 2'14  | <i>h</i> 1'80  | <i>l</i> 4'20  | <i>l</i> 4'68  | <i>l</i> 4'82  | <i>l</i> 4'50  | $M = 3''\cdot52$<br>$w = 10\cdot27$<br>$\frac{1}{w} = 0\cdot10$<br>$C = 48^\circ 53' 3''\cdot52$   |
|                                                                                             | <i>l</i> 1'36                                 | <i>l</i> 4'36  | <i>l</i> 5'26  | <i>l</i> 3'00  | <i>h</i> 3'40  | <i>h</i> 3'02  | <i>l</i> 4'10  | <i>l</i> 3'50  | <i>l</i> 4'54  | <i>l</i> 2'96  |                                                                                                    |
|                                                                                             | 2'06                                          | 4'29           | 4'01           | 3'01           | 2'77           | 2'41           | 4'15           | 4'09           | 4'68           | 3'73           |                                                                                                    |

| At XXVII                                                                                                     |                                              |          |          |          |          |          |          |          |         |          |                                                                                            |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|---------|----------|--------------------------------------------------------------------------------------------|
| <i>February and March 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |          |          |          |          |          |          |          |         |          |                                                                                            |
| Angle between                                                                                                | Circle readings, telescope being set on XXX  |          |          |          |          |          |          |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                              | 0° 0'                                        | 180° 0'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 25' | 21° 36'  | 201° 36' | 28° 48' | 208° 48' |                                                                                            |
| XXX & XXIX                                                                                                   | "                                            | "        | "        | "        | "        | "        | "        | "        | "       | "        | <i>M</i> = 56".88<br><i>w</i> = 18.46<br>$\frac{1}{w}$ = 0.05<br><i>C</i> = 59° 24' 56".87 |
|                                                                                                              | l 56.14                                      | l 57.76  | l 56.94  | l 57.28  | l 57.04  | l 57.44  | l 58.72  | l 57.40  | l 58.58 | h 56.72  |                                                                                            |
|                                                                                                              | l 56.04                                      | l 56.06  | l 55.62  | l 56.66  | l 55.40  | l 56.64  | l 57.02  | l 56.98  | l 56.56 | l 56.72  |                                                                                            |
|                                                                                                              | 56.09                                        | 56.91    | 56.19    | 56.97    | 56.22    | 57.04    | 57.87    | 57.19    | 57.57   | 56.72    |                                                                                            |
| XXIX & XXVIII                                                                                                | h 61.66                                      | h 57.82  | l 59.90  | l 61.60  | l 61.10  | l 60.50  | l 61.54  | l 61.68  | l 60.58 | h 58.64  | <i>M</i> = 0".69<br><i>w</i> = 7.25<br>$\frac{1}{w}$ = 0.14<br><i>C</i> = 49° 31' 0".69    |
|                                                                                                              | h 59.58                                      | h 59.58  | l 60.76  | l 60.30  | l 63.00  | l 60.00  | l 61.30  | l 62.86  | l 60.58 | l 61.04  |                                                                                            |
|                                                                                                              |                                              |          | l 59.90  |          |          |          |          |          |         |          |                                                                                            |
|                                                                                                              | 60.62                                        | 58.70    | 60.19    | 60.95    | 62.05    | 60.25    | 61.42    | 62.27    | 60.58   | 59.84    |                                                                                            |
| XXVIII & XXVI                                                                                                | h 19.18                                      | h 20.12  | l 19.58  | l 19.46  | l 19.48  | l 20.00  | l 18.86  | l 19.40  | h 18.50 | h 19.38  | <i>M</i> = 19".53<br><i>w</i> = 21.30<br>$\frac{1}{w}$ = 0.05<br><i>C</i> = 45° 55' 19".53 |
|                                                                                                              | h 19.76                                      | h 20.84  | l 20.12  | l 19.72  | l 19.42  | l 20.20  | l 19.48  | l 17.18  | h 19.84 | h 20.10  |                                                                                            |
|                                                                                                              |                                              |          |          |          |          |          |          |          |         |          |                                                                                            |
|                                                                                                              | 19.47                                        | 20.48    | 19.85    | 19.59    | 19.45    | 20.10    | 19.17    | 18.29    | 19.17   | 19.74    |                                                                                            |
| XXVI & XXV                                                                                                   | h 60.04                                      | h 59.20  | l 59.78  | l 58.02  | l 58.48  | l 57.94  | l 54.94  | l 58.76  | h 59.28 | h 59.16  | <i>M</i> = 58".77<br><i>w</i> = 10.99<br>$\frac{1}{w}$ = 0.09<br><i>C</i> = 53° 54' 58".76 |
|                                                                                                              | h 59.08                                      | h 58.70  | l 59.56  | l 58.64  | l 57.88  | l 58.88  | l 58.36  | l 59.20  | h 58.84 | h 60.12  |                                                                                            |
|                                                                                                              |                                              |          |          |          |          | l 57.52  |          |          |         |          |                                                                                            |
|                                                                                                              | 59.56                                        | 58.95    | 59.67    | 58.33    | 58.18    | 58.41    | 56.94    | 58.98    | 59.06   | 59.64    |                                                                                            |
| At XXVIII                                                                                                    |                                              |          |          |          |          |          |          |          |         |          |                                                                                            |
| <i>February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>           |                                              |          |          |          |          |          |          |          |         |          |                                                                                            |
| Angle between                                                                                                | Circle readings, telescope being set on XXVI |          |          |          |          |          |          |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                              | 110° 18'                                     | 290° 19' | 117° 30' | 297° 30' | 124° 42' | 304° 42' | 131° 54' | 311° 54' | 139° 5' | 319° 5'  |                                                                                            |
| XXVI & XXV                                                                                                   | "                                            | "        | "        | "        | "        | "        | "        | "        | "       | "        | <i>M</i> = 54".13<br><i>w</i> = 5.46<br>$\frac{1}{w}$ = 0.18<br><i>C</i> = 48° 46' 54".12  |
|                                                                                                              | h 55.92                                      | h 54.36  | l 55.48  | l 55.12  | l 52.72  | l 52.42  | d 52.88  | d 55.55  | l 52.54 | h 55.46  |                                                                                            |
|                                                                                                              | h 53.82                                      | h 54.98  | l 55.90  | h 55.80  | d 53.33  | l 51.24  | d 53.34  | d 53.81  | h 54.40 | h 54.72  |                                                                                            |
|                                                                                                              | d 54.31                                      |          |          |          | d 52.48  |          |          |          | d 52.70 |          |                                                                                            |
|                                                                                                              | 54.68                                        | 54.67    | 55.69    | 55.46    | 52.84    | 51.83    | 53.11    | 54.68    | 53.21   | 55.09    |                                                                                            |



## At XXVIII—(Continued.)

February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XXVI |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|---------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|------------------------------------------------------------------|
|               | 110° 18'                                     | 290° 19' | 117° 30' | 297° 30' | 124° 42' | 304° 42' | 131° 54' | 311° 54' | 139° 05' | 319° 5'  |                                                                  |
| XXV & XXVII   | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 44'' 76                                                      |
|               | h 42' 14                                     | h 44' 06 | l 45' 16 | l 45' 50 | l 47' 02 | l 47' 30 | d 45' 43 | d 44' 66 | l 46' 24 | h 43' 22 | w = 4 ' 10                                                       |
|               | h 44' 62                                     | h 42' 82 | l 43' 06 | h 43' 46 | d 46' 47 | l 47' 20 | d 45' 17 | d 42' 68 | h 45' 60 | h 43' 32 | $\frac{1}{w} = 0 ' 24$                                           |
|               | 43' 38                                       | 43' 44   | 44' 11   | 44' 48   | 46' 75   | 47' 25   | 45' 30   | 43' 67   | 45' 92   | 43' 27   | C = 36° 24' 44'' 76                                              |
| XXVII & XXIX  | d 32' 48                                     | l 30' 74 | l 29' 44 | l 30' 34 | l 30' 72 | l 32' 14 | h 28' 96 | h 28' 12 | l 31' 26 | h 28' 68 | M = 30'' 45                                                      |
|               |                                              |          | l 30' 14 | h 28' 30 | l 30' 48 | l 34' 42 | h 30' 02 | h 30' 30 | h 30' 36 | h 28' 90 | w = 4 ' 12                                                       |
|               | 32' 48                                       | 30' 74   | 29' 79   | 29' 32   | 30' 60   | 33' 28   | 29' 49   | 29' 21   | 30' 81   | 28' 79   | $\frac{1}{w} = 0 ' 24$                                           |
|               |                                              |          |          |          |          |          |          |          |          |          | C = 80° 10' 30'' 42                                              |
| XXIX & XXXI   | d 27' 12                                     | d 31' 21 | l 30' 40 | l 28' 92 | l 31' 58 | l 30' 68 | h 30' 18 | h 31' 32 | l 27' 16 | h 31' 22 | M = 30'' 15                                                      |
|               |                                              |          | l 30' 76 | h 32' 34 | l 31' 22 | l 28' 32 | h 31' 10 | h 31' 78 | h 27' 34 | h 31' 96 | w = 3 ' 26                                                       |
|               | 27' 12                                       | 31' 21   | 30' 58   | 30' 63   | 31' 40   | 29' 50   | 30' 64   | 31' 55   | 27' 25   | 31' 59   | $\frac{1}{w} = 0 ' 31$                                           |
|               |                                              |          |          |          |          |          |          |          |          |          | C = 58° 55' 30'' 17                                              |

## At XXIX

January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XXXIII |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|---------------|------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|------------------------------------------------------------------|
|               | 0° 1'                                          | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                  |
| XXXIII & XXXI | "                                              | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 39'' 55                                                      |
|               | h 39' 38                                       | h 35' 94 | l 39' 24 | l 38' 08 | l 40' 62 | l 40' 34 | l 41' 68 | l 39' 44 | l 41' 94 | l 40' 46 | w = 5 ' 04                                                       |
|               | h 39' 30                                       | h 37' 66 | l 38' 24 | l 40' 82 | l 38' 76 | l 38' 74 | l 40' 40 | l 39' 44 | l 41' 64 | l 39' 16 | $\frac{1}{w} = 0 ' 20$                                           |
|               |                                                |          | l 39' 14 | l 39' 70 |          |          |          |          |          |          | C = 66° 8' 39'' 55                                               |
|               | 39' 34                                         | 36' 80   | 38' 74   | 39' 35   | 39' 69   | 39' 54   | 41' 04   | 39' 44   | 41' 79   | 39' 81   |                                                                  |

| At XXIX—(Continued.)                                                                       |                                                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                            |
|--------------------------------------------------------------------------------------------|------------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------------------------------------------------------------------------------------|
| January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                            |
| Angle between                                                                              | Circle readings, telescope being set on XXXIII |                  |                  |                  |                  |                  |                  |                  |                  |                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                            | 0°1'                                           | 180°1'           | 7°12'            | 187°12'          | 14°24'           | 194°24'          | 21°36'           | 201°36'          | 28°48'           | 208°48'          |                                                                                            |
| XXXI & XXVIII                                                                              | "                                              | "                | "                | "                | "                | "                | "                | "                | "                | "                | <i>M</i> = 41''20<br><i>w</i> = 8.44<br>$\frac{1}{w}$ = 0.12<br><i>C</i> = 79° 45' 41''20  |
|                                                                                            | h42°18<br>h41°04                               | h43°62<br>h41°82 | l42°18<br>l42°16 | l41°88<br>l40°02 | l40°76<br>l42°96 | l40°88<br>l42°02 | l39°98<br>l40°22 | l39°80<br>l41°78 | l39°56<br>l40°42 | l39°98<br>l40°84 |                                                                                            |
|                                                                                            | 41°61                                          | 42°72            | 42°17            | 40°53            | 42°19            | 41°45            | 40°10            | 40°79            | 39°99            | 40°41            |                                                                                            |
| XXVIII & XXVII                                                                             | l32°24<br>l35°24                               | h34°30<br>h34°06 | l32°32<br>l32°92 | l32°32<br>l32°58 | l34°10<br>l34°44 | l34°08<br>l34°16 | l34°04<br>l33°70 | l34°46<br>l34°16 | h35°92<br>h34°12 | l34°06<br>l34°62 | <i>M</i> = 33''84<br><i>w</i> = 13.70<br>$\frac{1}{w}$ = 0.07<br><i>C</i> = 50° 18' 33''84 |
|                                                                                            | 33°24                                          | 34°18            | 32°62            | 32°45            | 34°27            | 34°12            | 33°87            | 34°31            | 35°02            | 34°34            |                                                                                            |
| XXVII & XXX                                                                                | l55°72<br>l56°50                               | h56°54<br>h54°98 | l56°76<br>l56°66 | l55°42<br>l55°94 | l54°76<br>l56°68 | l55°50<br>l54°88 | l57°22<br>l56°22 | l58°48<br>l57°42 | h55°48<br>h56°04 | l55°88<br>l53°86 | <i>M</i> = 56''05<br><i>w</i> = 10.30<br>$\frac{1}{w}$ = 0.10<br><i>C</i> = 36° 47' 56''05 |
|                                                                                            | 56°11                                          | 55°76            | 56°71            | 55°68            | 55°72            | 55°19            | 56°72            | 57°95            | 55°76            | 54°87            |                                                                                            |
| XXX & XXXII                                                                                | l55°98<br>l55°62                               | h54°60<br>h57°78 | l56°72<br>l56°70 | l56°08<br>l56°46 | l56°04<br>l55°10 | l55°08<br>l57°24 | l54°16<br>l55°14 | l53°06<br>l54°28 | h58°06<br>h55°18 | l54°92<br>l56°68 | <i>M</i> = 55''74<br><i>w</i> = 8.18<br>$\frac{1}{w}$ = 0.12<br><i>C</i> = 63° 23' 55''75  |
|                                                                                            | 55°80                                          | 56°19            | 56°71            | 56°27            | 55°57            | 56°16            | 54°65            | 53°67            | 56°61            | 55°80            |                                                                                            |
| XXXII & XXXIII                                                                             | l14°44<br>l13°84                               | h15°76<br>h14°34 | l13°18<br>l14°96 | l15°12<br>l13°32 | l14°80<br>l14°70 | l13°90<br>l11°90 | l15°22<br>l14°68 | l14°64<br>l15°12 | h10°78<br>h13°90 | l13°84<br>l13°62 | <i>M</i> = 14''19<br><i>w</i> = 10.67<br>$\frac{1}{w}$ = 0.09<br><i>C</i> = 63° 35' 14''17 |
|                                                                                            | 14°14                                          | 15°05            | 14°07            | 14°22            | 14°75            | 12°90            | 14°95            | 14°88            | 13°17            | 13°73            |                                                                                            |

## At XXX

January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle<br>between | Circle readings, telescope being set on XXXII |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle     |
|------------------|-----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------|
|                  | 0° 1'                                         | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                      |
| XXXII &<br>XXIX  | "                                             | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 27" 95<br>w = 4 01<br>$\frac{1}{w}$ = 0 25<br>C = 59° 17' 27" 95 |
|                  | h 28° 00                                      | h 25° 74 | l 27° 04 | l 26° 68 | h 28° 08 | h 28° 18 | h 28° 54 | h 26° 78 | l 30° 40 | l 30° 38 |                                                                      |
|                  | h 25° 46                                      | h 26° 52 | l 25° 66 | l 28° 30 | h 27° 92 | h 29° 00 | h 27° 36 | h 27° 52 | l 31° 20 | l 29° 78 |                                                                      |
|                  | h 27° 42                                      |          |          |          |          |          |          |          |          |          |                                                                      |
|                  | 26° 96                                        | 26° 13   | 26° 35   | 27° 49   | 28° 00   | 28° 59   | 27° 95   | 27° 15   | 30° 80   | 30° 08   |                                                                      |
| XXIX &<br>XXVII  | h 9° 74                                       | h 10° 88 | l 10° 22 | l 10° 78 | h 11° 56 | h 9° 68  | h 10° 96 | h 9° 68  | l 6° 82  | l 6° 00  | M = 9" 63<br>w = 3 50<br>$\frac{1}{w}$ = 0 29<br>C = 83° 47' 9" 63   |
|                  | h 10° 48                                      | h 9° 80  | l 9° 64  | l 9° 00  | h 11° 18 | h 9° 82  | h 11° 96 | h 10° 50 | l 6° 70  | l 7° 24  |                                                                      |
|                  | 10° 11                                        | 10° 34   | 9° 93    | 9° 89    | 11° 37   | 9° 75    | 11° 46   | 10° 09   | 6° 76    | 6° 62    |                                                                      |

## At XXXI

January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle<br>between | Circle readings, telescope being set on XXVIII |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle     |
|------------------|------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------|
|                  | 0° 1'                                          | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                      |
| XXVIII &<br>XXIX | "                                              | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 53" 16<br>w = 6 23<br>$\frac{1}{w}$ = 0 16<br>C = 41° 18' 53" 16 |
|                  | l 52° 96                                       | l 50° 74 | l 53° 96 | l 52° 80 | h 54° 46 | h 54° 92 | l 53° 78 | l 53° 06 | l 54° 28 | l 54° 76 |                                                                      |
|                  | l 51° 00                                       | l 50° 52 | l 51° 56 | l 54° 12 | h 53° 66 | h 53° 54 | l 52° 72 | l 52° 44 | l 54° 22 | l 53° 78 |                                                                      |
|                  |                                                |          | l 52° 76 |          |          |          |          |          |          |          |                                                                      |
|                  | 51° 98                                         | 50° 63   | 52° 76   | 53° 46   | 54° 06   | 54° 23   | 53° 25   | 52° 75   | 54° 25   | 54° 27   |                                                                      |
| XXIX &<br>XXXIII | l 60° 02                                       | l 59° 48 | l 58° 48 | l 58° 40 | h 58° 74 | h 55° 74 | l 59° 98 | l 57° 94 | l 57° 34 | l 57° 02 | M = 58" 22<br>w = 6 50<br>$\frac{1}{w}$ = 0 15<br>C = 51° 14' 58" 22 |
|                  | l 60° 04                                       | l 59° 30 | l 59° 12 | l 57° 70 | h 58° 06 | h 56° 90 | l 58° 88 | l 56° 50 | l 56° 86 | l 57° 90 |                                                                      |
|                  | 60° 03                                         | 59° 39   | 58° 80   | 58° 05   | 58° 40   | 56° 32   | 59° 43   | 57° 22   | 57° 10   | 57° 46   |                                                                      |

| At XXXII                                                                                          |                                              |           |           |           |           |           |           |           |           |           |                                                                  |
|---------------------------------------------------------------------------------------------------|----------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------------------------------------------|
| <i>January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |           |           |           |           |           |           |           |           |           |                                                                  |
| Angle<br>between                                                                                  | Circle readings, telescope being set on XXXV |           |           |           |           |           |           |           |           |           | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                   | 0° 2'                                        | 180° 2'   | 7° 12'    | 187° 12'  | 14° 24'   | 194° 24'  | 21° 36'   | 201° 36'  | 28° 48'   | 208° 48'  |                                                                  |
| XXXV &<br>XXXIV                                                                                   | "                                            | "         | "         | "         | "         | "         | "         | "         | "         | "         | M = 5''·73                                                       |
|                                                                                                   | l 4° 50'                                     | l 4° 80'  | l 4° 70'  | l 6° 04'  | l 5° 20'  | l 6° 20'  | l 5° 12'  | l 5° 80'  | l 7° 86'  | l 5° 78'  | w = 14·70                                                        |
|                                                                                                   | l 4° 94'                                     | l 5° 70'  | l 5° 30'  | l 5° 98'  | l 6° 52'  | l 6° 54'  | l 4° 98'  | l 6° 74'  | l 6° 64'  | l 5° 16'  | $\frac{1}{w} = 0\cdot07$                                         |
|                                                                                                   | 4° 72'                                       | 5° 25'    | 5° 00'    | 6° 01'    | 5° 86'    | 6° 37'    | 5° 05'    | 6° 27'    | 7° 25'    | 5° 47'    | C = 72° 4' 5''·73                                                |
| XXXIV &<br>XXXIII                                                                                 | l 59° 90'                                    | l 57° 96' | l 58° 76' | l 58° 62' | l 60° 40' | l 59° 84' | l 59° 82' | l 59° 30' | l 57° 44' | l 58° 98' | M = 59''·19                                                      |
|                                                                                                   | l 58° 18'                                    | l 59° 10' | l 59° 54' | l 57° 18' | l 62° 08' | l 58° 38' | l 61° 18' | l 59° 74' | l 56° 84' | l 60° 54' | w = 6·10                                                         |
|                                                                                                   |                                              |           |           |           |           |           |           |           |           |           | $\frac{1}{w} = 0\cdot16$                                         |
|                                                                                                   | 59° 04'                                      | 58° 53'   | 59° 15'   | 57° 90'   | 61° 24'   | 59° 11'   | 60° 50'   | 59° 52'   | 57° 14'   | 59° 76'   | C = 39° 31' 59''·19                                              |
| XXXIII &<br>XXIX                                                                                  | l 35° 14'                                    | l 35° 78' | l 35° 48' | l 34° 18' | l 35° 34' | l 35° 36' | l 34° 64' | l 34° 50' | l 36° 34' | l 37° 76' | M = 35''·26                                                      |
|                                                                                                   | l 35° 34'                                    | l 35° 08' | l 33° 98' | l 35° 34' | l 32° 80' | l 36° 12' | l 34° 18' | l 34° 08' | l 37° 36' | l 35° 78' | w = 8·97                                                         |
|                                                                                                   |                                              |           |           |           | l 35° 12' |           |           |           |           |           | $\frac{1}{w} = 0\cdot11$                                         |
|                                                                                                   | 35° 24'                                      | 35° 43'   | 34° 73'   | 34° 76'   | 34° 42'   | 35° 74'   | 34° 41'   | 34° 29'   | 36° 85'   | 36° 77'   | C = 57° 56' 35''·25                                              |
| XXIX &<br>XXX                                                                                     | l 41° 64'                                    | l 39° 92' | l 42° 30' | l 42° 08' | l 40° 18' | l 40° 60' | l 40° 98' | l 40° 30' | l 38° 78' | l 38° 40' | M = 40''·69                                                      |
|                                                                                                   | l 41° 86'                                    | l 39° 68' | l 42° 22' | l 41° 54' | l 42° 00' | l 41° 36' | l 40° 02' | l 39° 50' | l 40° 58' | l 39° 32' | w = 7·42                                                         |
|                                                                                                   |                                              |           |           |           | l 41° 74' |           |           |           |           |           | $\frac{1}{w} = 0\cdot13$                                         |
|                                                                                                   | 41° 75'                                      | 39° 80'   | 42° 26'   | 41° 81'   | 41° 31'   | 40° 98'   | 40° 50'   | 39° 90'   | 39° 68'   | 38° 86'   | C = 57° 18' 40''·69                                              |
| At XXXIII                                                                                         |                                              |           |           |           |           |           |           |           |           |           |                                                                  |
| <i>January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |           |           |           |           |           |           |           |           |           |                                                                  |
| Angle<br>between                                                                                  | Circle readings, telescope being set on XXXI |           |           |           |           |           |           |           |           |           | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                   | 23° 59'                                      | 208° 59'  | 31° 10'   | 211° 10'  | 38° 22'   | 218° 22'  | 45° 33'   | 225° 33'  | 52° 46'   | 232° 46'  |                                                                  |
| XXXI &<br>XXIX                                                                                    | "                                            | "         | "         | "         | "         | "         | "         | "         | "         | "         | M = 27''·19                                                      |
|                                                                                                   | l 26° 30'                                    | l 27° 70' | h 25° 96' | h 28° 04' | h 24° 42' | h 27° 24' | l 28° 00' | l 27° 48' | l 28° 44' | l 27° 90' | w = 5·70                                                         |
|                                                                                                   | l 24° 92'                                    | l 27° 22' | h 27° 20' | h 26° 38' | h 24° 84' | h 27° 58' | l 28° 16' | l 28° 06' | l 28° 98' | l 29° 02' | $\frac{1}{w} = 0\cdot18$                                         |
|                                                                                                   | 25° 61'                                      | 27° 46'   | 26° 58'   | 27° 21'   | 24° 63'   | 27° 41'   | 28° 08'   | 27° 77'   | 28° 71'   | 28° 46'   | C = 62° 36' 27''·19                                              |

## OBSERVED ANGLES.

53—B.

At XXXIII—(Continued.)

January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between                                                                               | Circle readings, telescope being set on XXXI  |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|---------------------------------------------------------------------------------------------|-----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|------------------------------------------------------------------|
|                                                                                             | 28° 59'                                       | 208° 59' | 81° 10'  | 211° 10' | 38° 22'  | 218° 22' | 45° 33'  | 225° 33' | 52° 46'  | 232° 45' |                                                                  |
| XXXIX & XXXII                                                                               | "                                             | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 14''·41                                                      |
|                                                                                             | l 14° 96                                      | l 15° 30 | h 15° 66 | h 13° 46 | h 16° 36 | h 15° 36 | h 12° 84 | h 14° 62 | l 12° 78 | l 14° 42 | w = 12 ·20                                                       |
|                                                                                             | l 15° 50                                      | l 14° 56 | h 14° 22 | h 13° 60 | h 14° 46 | h 13° 96 | h 14° 54 | h 14° 88 | l 14° 06 | l 12° 66 | $\frac{1}{w} = 0 \cdot 08$                                       |
|                                                                                             | 15° 23                                        | 14° 93   | 14° 94   | 13° 53   | 15° 41   | 14° 66   | 13° 69   | 14° 75   | 13° 42   | 13° 54   | C = 58° 28' 14''·41                                              |
| XXXII & XXXIV                                                                               | l 2° 90                                       | l 1° 92  | h 4° 74  | h 3° 70  | h 3° 00  | h 4° 72  | h 4° 12  | h 5° 20  | l 6° 04  | l 4° 06  | M = 4''·06                                                       |
|                                                                                             | l 3° 00                                       | l 4° 06  | h 5° 12  | h 4° 42  | h 2° 92  | h 4° 64  | h 4° 74  | h 4° 20  | l 4° 20  | l 3° 54  | w = 11 ·60                                                       |
|                                                                                             | 2° 95                                         | 2° 99    | 4° 93    | 4° 06    | 2° 96    | 4° 68    | 4° 43    | 4° 70    | 5° 12    | 3° 80    | $\frac{1}{w} = 0 \cdot 09$                                       |
|                                                                                             |                                               |          |          |          |          |          |          |          |          |          | C = 54° 1' 4''·06                                                |
| XXXIV & XXXVI                                                                               | l 54° 20                                      | l 54° 68 | h 52° 42 | h 50° 94 | h 53° 32 | h 52° 38 | h 53° 90 | h 51° 16 | l 53° 06 | l 53° 76 | M = 53''·46                                                      |
|                                                                                             | l 54° 62                                      | l 54° 60 | h 53° 64 | h 52° 70 | h 55° 24 | h 53° 58 | h 52° 80 | h 53° 86 | l 54° 08 | l 54° 16 | w = 9 ·59                                                        |
|                                                                                             |                                               |          |          |          |          |          | h 52° 50 |          |          |          | $\frac{1}{w} = 0 \cdot 10$                                       |
|                                                                                             | 54° 41                                        | 54° 64   | 53° 03   | 51° 82   | 54° 28   | 52° 98   | 53° 35   | 52° 51   | 53° 57   | 53° 96   | C = 49° 48' 53''·45                                              |
| At XXXIV                                                                                    |                                               |          |          |          |          |          |          |          |          |          |                                                                  |
| December 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                               |          |          |          |          |          |          |          |          |          |                                                                  |
| Angle between                                                                               | Circle readings, telescope being set on XXXVI |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                             | 0° 1'                                         | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                  |
| XXXVI & XXXIII                                                                              | "                                             | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 50''·76                                                      |
|                                                                                             | l 48° 42                                      | l 52° 92 | l 50° 82 | l 50° 56 | l 52° 00 | l 51° 70 | l 52° 00 | l 50° 30 | l 51° 54 | l 51° 38 | w = 13 ·38                                                       |
|                                                                                             | l 50° 10                                      | l 49° 98 | l 49° 98 | l 50° 08 | l 49° 94 | l 50° 94 | l 50° 58 | l 51° 20 | l 51° 80 | l 49° 58 | $\frac{1}{w} = 0 \cdot 07$                                       |
|                                                                                             |                                               | l 50° 42 |          | l 51° 14 |          |          |          |          |          |          | C = 57° 48' 50''·77                                              |
|                                                                                             | 49° 26                                        | 51° 11   | 50° 40   | 50° 32   | 51° 03   | 51° 32   | 51° 29   | 50° 75   | 51° 67   | 50° 48   |                                                                  |
| XXXIII & XXXII                                                                              | l 61° 26                                      | l 58° 94 | l 58° 96 | l 59° 84 | l 59° 84 | l 60° 24 | l 59° 76 | l 60° 34 | l 60° 18 | l 60° 84 | M = 59''·61                                                      |
|                                                                                             | l 59° 20                                      | l 59° 26 | l 58° 58 | l 59° 14 | l 59° 28 | l 59° 28 | l 59° 74 | l 59° 22 | l 59° 26 | l 59° 06 | w = 31 ·30                                                       |
|                                                                                             | 60° 23                                        | 59° 10   | 58° 77   | 59° 49   | 59° 56   | 59° 76   | 59° 75   | 59° 78   | 59° 72   | 59° 95   | $\frac{1}{w} = 0 \cdot 03$                                       |
|                                                                                             |                                               |          |          |          |          |          |          |          |          |          | C = 86° 26' 59''·61                                              |

| At XXXIV—(Continued.)                                                                              |                                                |                    |                    |                               |                    |                    |                              |                    |                    |                               |                                                                  |
|----------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------|--------------------|-------------------------------|--------------------|--------------------|------------------------------|--------------------|--------------------|-------------------------------|------------------------------------------------------------------|
| <i>December 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                    |                    |                               |                    |                    |                              |                    |                    |                               |                                                                  |
| Angle<br>between                                                                                   | Circle readings, telescope being set on XXXVI  |                    |                    |                               |                    |                    |                              |                    |                    |                               | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                    | 0° 1'                                          | 180° 1'            | 7° 12'             | 187° 12'                      | 14° 24'            | 194° 24'           | 21° 36'                      | 201° 36'           | 28° 48'            | 208° 48'                      |                                                                  |
| XXXII &<br>XXXV                                                                                    | "                                              | "                  | "                  | "                             | "                  | "                  | "                            | "                  | "                  | "                             | M = 9''49                                                        |
|                                                                                                    | l 9'56<br>l 8'06<br>l 7'86                     | l 7'96<br>l 7'36   | l 8'72<br>l 10'26  | l 9'44<br>l 9'44<br>l 10'10   | l 10'84<br>l 10'44 | l 9'00<br>l 9'46   | l 9'70<br>l 9'80             | l 11'12<br>l 8'86  | l 10'70<br>l 9'54  | l 9'34<br>l 10'30             | w = 11.16<br>I/w = 0.09<br>C = 47° 39' 9''48                     |
| XXXV &<br>XXXVII                                                                                   | l 54'66<br>l 55'46                             | l 55'48<br>l 53'96 | l 56'66<br>l 55'00 | l 54'54<br>l 55'40<br>l 54'52 | l 54'66<br>l 55'42 | l 55'42<br>l 55'58 | l 55'74<br>l 55'82           | l 53'38<br>l 55'26 | l 53'66<br>l 53'86 | l 54'94<br>l 55'04            | M = 54''98<br>w = 18.38<br>I/w = 0.05<br>C = 41° 13' 54''98      |
|                                                                                                    | 55'06                                          | 54'72              | 55'83              | 54'82                         | 55'04              | 55'50              | 55'78                        | 54'32              | 53'76              | 54'99                         |                                                                  |
| XXXVII &<br>XXXVIII                                                                                | l 11'32<br>l 11'30                             | l 11'28<br>l 11'88 | l 9'86<br>l 9'48   | l 11'74<br>l 9'20<br>l 10'62  | l 9'98<br>l 11'38  | l 10'50<br>l 10'76 | l 8'10<br>l 11'12<br>l 11'10 | l 11'14<br>l 12'24 | l 10'56<br>l 12'06 | l 9'46<br>l 11'66             | M = 10''81<br>w = 13.28<br>I/w = 0.08<br>C = 73° 17' 10''79      |
|                                                                                                    | 11'31                                          | 11'58              | 9'67               | 10'52                         | 10'68              | 10'63              | 10'11                        | 11'69              | 11'31              | 10'56                         |                                                                  |
| XXXVIII &<br>XXXVI                                                                                 | l 53'54<br>l 53'54                             | l 53'46<br>l 54'24 | l 54'04<br>l 55'60 | l 52'54<br>l 54'72<br>l 53'68 | l 53'88<br>l 53'74 | l 53'78<br>l 53'46 | l 55'78<br>l 54'64           | l 53'50<br>l 53'54 | l 55'28<br>l 54'88 | l 55'54<br>l 52'44<br>l 51'76 | M = 54''04<br>w = 12.58<br>I/w = 0.08<br>C = 53° 33' 54''02      |
|                                                                                                    | 53'54                                          | 53'85              | 54'82              | 53'65                         | 53'81              | 53'62              | 55'21                        | 53'52              | 55'08              | 53'25                         |                                                                  |
| At XXXV                                                                                            |                                                |                    |                    |                               |                    |                    |                              |                    |                    |                               |                                                                  |
| <i>January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>  |                                                |                    |                    |                               |                    |                    |                              |                    |                    |                               |                                                                  |
| Angle<br>between                                                                                   | Circle readings, telescope being set on XXXVII |                    |                    |                               |                    |                    |                              |                    |                    |                               | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                    | 0° 1'                                          | 180° 1'            | 7° 12'             | 187° 12'                      | 14° 24'            | 194° 24'           | 21° 36'                      | 201° 36'           | 28° 48'            | 208° 48'                      |                                                                  |
| XXXVII &<br>XXXIV                                                                                  | "                                              | "                  | "                  | "                             | "                  | "                  | "                            | "                  | "                  | "                             | M = 17''84                                                       |
|                                                                                                    | h 14'96<br>h 14'86                             | h 16'94<br>h 15'62 | l 15'70<br>l 16'30 | l 17'94<br>l 17'88            | l 19'42<br>l 19'78 | l 19'28<br>l 18'86 | l 18'36<br>l 18'28           | l 16'58<br>l 16'98 | l 19'96<br>l 18'96 | l 20'96<br>l 19'22            | w = 3.10<br>I/w = 0.32<br>C = 67° 12' 17''84                     |
|                                                                                                    | 14'91                                          | 16'28              | 16'00              | 17'91                         | 19'60              | 19'07              | 18'32                        | 16'78              | 19'46              | 20'09                         |                                                                  |

| <i>At XXXV—(Continued.)</i>                                                                        |                                                |                |                |                |                |                |                |                |                |                |                                                                                            |
|----------------------------------------------------------------------------------------------------|------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------------------------------------------------------------------------|
| <i>January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>  |                                                |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle<br>between                                                                                   | Circle readings, telescope being set on XXXVII |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                    | 0° 1'                                          | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                            |
| XXXIV &<br>XXXII                                                                                   | "                                              | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 45''88<br><i>w</i> = 9'30<br>$\frac{1}{w}$ = 0'11<br><i>C</i> = 60° 16' 45''88  |
|                                                                                                    | <i>h</i> 47'58                                 | <i>h</i> 44'66 | <i>l</i> 47'70 | <i>l</i> 45'08 | <i>l</i> 44'88 | <i>l</i> 45'62 | <i>l</i> 45'38 | <i>l</i> 48'00 | <i>l</i> 46'16 | <i>l</i> 44'86 |                                                                                            |
|                                                                                                    | <i>h</i> 46'46                                 | <i>h</i> 45'26 | <i>l</i> 46'72 | <i>l</i> 45'42 | <i>l</i> 45'00 | <i>l</i> 45'06 | <i>l</i> 46'10 | <i>l</i> 47'00 | <i>l</i> 44'46 | <i>l</i> 46'14 |                                                                                            |
|                                                                                                    | 47'02                                          | 44'96          | 47'21          | 45'25          | 44'94          | 45'34          | 45'74          | 47'50          | 45'31          | 45'50          |                                                                                            |
| <i>At XXXVI</i>                                                                                    |                                                |                |                |                |                |                |                |                |                |                |                                                                                            |
| <i>December 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle<br>between                                                                                   | Circle readings, telescope being set on XXXIII |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                    | 0° 1'                                          | 180° 1'        | 7° 12'         | 187° 12'       | 14° 25'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                            |
| XXXIII &<br>XXXIV                                                                                  | "                                              | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 16''89<br><i>w</i> = 12'57<br>$\frac{1}{w}$ = 0'08<br><i>C</i> = 72° 22' 16''89 |
|                                                                                                    | <i>h</i> 18'98                                 | <i>h</i> 17'64 | <i>l</i> 16'56 | <i>l</i> 15'06 | <i>l</i> 17'80 | <i>l</i> 16'56 | <i>l</i> 17'38 | <i>l</i> 16'88 | <i>l</i> 18'04 | <i>l</i> 16'94 |                                                                                            |
|                                                                                                    | <i>h</i> 17'46                                 | <i>l</i> 15'74 | <i>l</i> 16'72 | <i>l</i> 15'46 | <i>l</i> 17'14 | <i>l</i> 16'32 | <i>l</i> 17'16 | <i>l</i> 16'18 | <i>l</i> 17'64 | <i>l</i> 16'44 |                                                                                            |
|                                                                                                    | 18'22                                          | 16'57          | 16'64          | 15'26          | 17'47          | 16'44          | 17'27          | 16'53          | 17'84          | 16'69          |                                                                                            |
| XXXIV &<br>XXXVIII                                                                                 | <i>h</i> 1'92                                  | <i>l</i> 1'06  | <i>l</i> 2'72  | <i>l</i> 4'66  | <i>l</i> 3'34  | <i>l</i> 3'88  | <i>l</i> 3'60  | <i>l</i> 2'12  | <i>l</i> 2'86  | <i>l</i> 2'32  | <i>M</i> = 2''92<br><i>w</i> = 11'80<br>$\frac{1}{w}$ = 0'08<br><i>C</i> = 88° 32' 2''92   |
|                                                                                                    | <i>h</i> 1'44                                  | <i>l</i> 1'64  | <i>l</i> 4'08  | <i>l</i> 3'22  | <i>l</i> 3'58  | <i>l</i> 3'80  | <i>l</i> 3'42  | <i>l</i> 2'98  | <i>l</i> 2'72  | <i>l</i> 3'06  |                                                                                            |
|                                                                                                    | 1'68                                           | 1'35           | 3'40           | 3'94           | 3'46           | 3'84           | 3'51           | 2'55           | 2'79           | 2'69           |                                                                                            |
| <i>At XXXVII</i>                                                                                   |                                                |                |                |                |                |                |                |                |                |                |                                                                                            |
| <i>February 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle<br>between                                                                                   | Circle readings, telescope being set on XL     |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                    | 0° 1'                                          | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                            |
| XL &<br>XXXIX                                                                                      | <i>l</i> 27'42                                 | <i>l</i> 26'30 | <i>l</i> 28'18 | <i>l</i> 29'86 | <i>l</i> 27'72 | <i>l</i> 29'18 | <i>h</i> 28'08 | <i>h</i> 26'48 | <i>h</i> 26'70 | <i>h</i> 27'82 | <i>M</i> = 27''91<br><i>w</i> = 11'90<br>$\frac{1}{w}$ = 0'08<br><i>C</i> = 80° 54' 27''91 |
|                                                                                                    | <i>l</i> 27'56                                 | <i>l</i> 27'42 | <i>l</i> 27'84 | <i>l</i> 29'70 | <i>l</i> 28'92 | <i>l</i> 27'86 | <i>h</i> 28'24 | <i>h</i> 27'54 | <i>h</i> 27'86 | <i>h</i> 27'54 |                                                                                            |
|                                                                                                    | 27'49                                          | 26'86          | 28'01          | 29'78          | 28'32          | 28'52          | 28'16          | 27'01          | 27'28          | 27'68          |                                                                                            |

KARACHI LONGITUDINAL SERIES.

| At XXXVII—(Continued.)                                                                             |                                               |          |          |          |          |          |          |          |          |          |                                                                                            |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------------------------------------------------------------------------------|
| <i>February 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |          |          |          |          |          |          |          |          |          |                                                                                            |
| Angle between                                                                                      | Circle readings, telescope being set on XL    |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                    | 0° 1'                                         | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                                            |
| XXXIX & XXXVIII                                                                                    | "                                             | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 41" 01<br><i>w</i> = 13 30<br>$\frac{1}{w}$ = 0 08<br><i>C</i> = 35° 22' 41" 01 |
|                                                                                                    | l 41' 30                                      | l 41' 70 | l 40' 62 | l 40' 20 | l 42' 58 | l 41' 12 | h 39' 74 | h 40' 74 | h 40' 04 | h 42' 22 |                                                                                            |
|                                                                                                    | l 41' 46                                      | l 41' 48 | l 40' 96 | l 39' 64 | l 41' 76 | l 42' 30 | h 40' 22 | h 41' 10 | h 39' 86 | h 41' 10 |                                                                                            |
|                                                                                                    | 41' 38                                        | 41' 59   | 40' 79   | 39' 92   | 42' 17   | 41' 71   | 39' 98   | 40' 92   | 39' 95   | 41' 66   |                                                                                            |
| XXXVIII & XXXIV                                                                                    | h 20' 34                                      | h 21' 08 | l 22' 26 | l 20' 76 | l 19' 06 | l 19' 28 | l 20' 80 | l 20' 60 | l 20' 82 | l 19' 30 | <i>M</i> = 20" 38<br><i>w</i> = 22 42<br>$\frac{1}{w}$ = 0 04<br><i>C</i> = 51° 56' 20" 39 |
|                                                                                                    | h 20' 20                                      | h 20' 56 | l 20' 24 | l 19' 70 | l 20' 12 | l 19' 58 | l 20' 56 | l 20' 28 | l 21' 24 | l 21' 08 |                                                                                            |
|                                                                                                    |                                               |          | l 20' 90 |          |          |          |          |          |          |          |                                                                                            |
|                                                                                                    | 20' 27                                        | 20' 82   | 21' 13   | 20' 23   | 19' 59   | 19' 43   | 20' 68   | 20' 44   | 21' 03   | 20' 19   |                                                                                            |
| XXXIV & XXXV                                                                                       | h 51' 86                                      | h 49' 58 | l 50' 04 | l 49' 90 | l 52' 26 | l 52' 38 | l 51' 94 | l 51' 42 | l 51' 68 | l 50' 96 | <i>M</i> = 51" 36<br><i>w</i> = 14 00<br>$\frac{1}{w}$ = 0 07<br><i>C</i> = 71° 33' 51" 36 |
|                                                                                                    | h 51' 32                                      | h 51' 06 | l 51' 82 | l 50' 28 | l 52' 66 | l 51' 42 | l 52' 58 | l 51' 62 | l 50' 34 | l 51' 86 |                                                                                            |
|                                                                                                    |                                               |          | l 51' 12 |          |          |          |          |          |          |          |                                                                                            |
|                                                                                                    | 51' 59                                        | 50' 32   | 50' 99   | 50' 09   | 52' 46   | 51' 90   | 52' 26   | 51' 52   | 51' 01   | 51' 41   |                                                                                            |
| At XXXVIII                                                                                         |                                               |          |          |          |          |          |          |          |          |          |                                                                                            |
| <i>December 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |          |          |          |          |          |          |          |          |          |                                                                                            |
| Angle between                                                                                      | Circle readings, telescope being set on XXXVI |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                    | 0° 1'                                         | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                                            |
| XXXVI & XXXIV                                                                                      | "                                             | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 5" 32<br><i>w</i> = 20 22<br>$\frac{1}{w}$ = 0 05<br><i>C</i> = 37° 54' 5" 32   |
|                                                                                                    | l 6' 20                                       | l 4' 02  | l 5' 68  | l 6' 20  | l 6' 46  | l 5' 92  | l 5' 16  | l 5' 72  | l 5' 46  | h 5' 98  |                                                                                            |
|                                                                                                    | l 3' 86                                       | l 4' 36  | l 4' 74  | l 5' 48  | l 5' 54  | l 5' 60  | l 4' 66  | l 4' 28  | h 5' 00  | h 6' 24  |                                                                                            |
|                                                                                                    | l 4' 82                                       |          |          |          |          |          |          |          |          |          |                                                                                            |
|                                                                                                    | 4' 96                                         | 4' 19    | 5' 21    | 5' 84    | 6' 00    | 5' 76    | 4' 91    | 5' 00    | 5' 23    | 6' 11    |                                                                                            |
| XXXIV & XXXVII                                                                                     | l 33' 06                                      | l 33' 40 | l 30' 72 | l 30' 64 | l 33' 36 | l 31' 44 | l 33' 78 | l 33' 24 | l 31' 84 | h 32' 24 | <i>M</i> = 32" 35<br><i>w</i> = 6 60<br>$\frac{1}{w}$ = 0 15<br><i>C</i> = 54° 46' 32" 35  |
|                                                                                                    | l 34' 56                                      | l 33' 04 | l 32' 02 | l 30' 14 | l 33' 20 | l 30' 88 | l 33' 90 | l 32' 16 | l 32' 22 | h 31' 20 |                                                                                            |
|                                                                                                    |                                               |          |          |          |          |          |          |          |          |          |                                                                                            |
|                                                                                                    | 33' 81                                        | 33' 22   | 31' 37   | 30' 39   | 33' 28   | 31' 16   | 33' 84   | 32' 70   | 32' 03   | 31' 72   |                                                                                            |



## At XXXVIII—(Continued.)

December 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle<br>between  | Circle readings, telescope being set on XXXVI |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle          |
|-------------------|-----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------|
|                   | 0° 1'                                         | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                           |
| XXXVII<br>& XXXIX | "                                             | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 34''·13<br>w = 14 ·10<br>$\frac{1}{w}$ = 0 ·07<br>C = 38° 5' 34''·13  |
|                   | l 33'·82                                      | l 34'·20 | l 35'·54 | l 34'·64 | l 34'·06 | l 36'·08 | l 34'·36 | l 33'·36 | h 33'·78 | h 32'·36 |                                                                           |
|                   | l 33'·82                                      | l 33'·96 | l 34'·20 | l 34'·54 | l 32'·90 | l 35'·36 | l 34'·44 | l 34'·26 | h 33'·12 | h 33'·82 |                                                                           |
|                   | 33'·82                                        | 34'·08   | 34'·87   | 34'·59   | 33'·48   | 35'·72   | 34'·40   | 33'·81   | 33'·45   | 33'·09   |                                                                           |
| XXXIX &<br>XLI    | l 50'·10                                      | l 49'·36 | l 50'·24 | l 51'·08 | l 50'·92 | l 48'·94 | l 49'·42 | l 50'·68 | h 50'·76 | h 51'·08 | M = 50''·45<br>w = 15 ·90<br>$\frac{1}{w}$ = 0 ·06<br>C = 64° 51' 50''·45 |
|                   | l 50'·42                                      | l 49'·92 | l 51'·00 | l 51'·52 | l 51'·78 | l 50'·22 | l 48'·96 | l 50'·82 | h 51'·30 | h 50'·46 |                                                                           |
|                   | 50'·26                                        | 49'·64   | 50'·62   | 51'·30   | 51'·35   | 49'·58   | 49'·19   | 50'·75   | 51'·03   | 50'·77   |                                                                           |

## At XXXIX

February 1851, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.

| Angle<br>between    | Circle readings, telescope being set on XXXVIII |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle          |
|---------------------|-------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------|
|                     | 0° 2'                                           | 180° 3'  | 7° 12'   | 187° 13' | 14° 24'  | 194° 25' | 21° 37'  | 201° 37' | 28° 49'  | 208° 50' |                                                                           |
| XXXVIII<br>& XXXVII | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 47''·21<br>w = 6 ·00<br>$\frac{1}{w}$ = 0 ·17<br>C = 106° 31' 47''·21 |
|                     | l 47'·30                                        | l 45'·52 | l 46'·08 | l 45'·74 | l 46'·72 | l 47'·90 | h 48'·50 | h 48'·56 | h 48'·28 | l 49'·28 |                                                                           |
|                     | l 47'·14                                        | l 44'·54 | l 45'·40 | l 47'·16 | l 47'·14 | l 46'·90 | h 49'·58 | h 46'·72 | l 47'·86 | l 47'·84 |                                                                           |
|                     | 47'·22                                          | 45'·03   | 45'·74   | 46'·45   | 46'·93   | 47'·40   | 49'·04   | 47'·64   | 48'·07   | 48'·56   |                                                                           |
| XXXVII<br>& XL      | l 12'·06                                        | l 10'·34 | l 9'·68  | l 11'·48 | l 11'·54 | l 9'·62  | h 10'·88 | h 8'·26  | h 9'·52  | l 7'·84  | M = 10''·18<br>w = 8 ·90<br>$\frac{1}{w}$ = 0 ·11<br>C = 61° 39' 10''·18  |
|                     | l 10'·98                                        | l 11'·48 | l 10'·60 | l 10'·00 | l 10'·36 | l 11'·38 | h 9'·34  | h 9'·44  | l 9'·12  | l 9'·60  |                                                                           |
|                     | 11'·52                                          | 10'·91   | 10'·14   | 10'·74   | 10'·95   | 10'·50   | 10'·11   | 8'·85    | 9'·32    | 8'·72    |                                                                           |

| At XXXIX—(Continued.)                                                                       |                                                 |          |          |          |          |          |          |          |          |          |                                                                                                    |
|---------------------------------------------------------------------------------------------|-------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------------------------------------|
| <i>February 1851, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                 |          |          |          |          |          |          |          |          |          |                                                                                                    |
| Angle between                                                                               | Circle readings, telescope being set on XXXVIII |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle              |
|                                                                                             | 0° 2'                                           | 180° 3'  | 7° 12'   | 187° 13' | 14° 24'  | 194° 25' | 21° 37'  | 201° 37' | 28° 49'  | 208° 50' |                                                                                                    |
| XL & XLII                                                                                   | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 41''·22<br><br><i>w</i> = 11 '90<br>$\frac{1}{w}$ = 0 '08<br><i>C</i> = 43° 24' 41''·22 |
|                                                                                             | l 40° 72                                        | l 42° 06 | l 42° 48 | l 41° 58 | l 40° 24 | l 40° 70 | h 41° 80 | h 41° 00 | l 42° 62 | l 41° 64 |                                                                                                    |
|                                                                                             | l 40° 30                                        | l 40° 88 | l 40° 98 | l 41° 76 | l 40° 24 | l 39° 70 | h 40° 14 | h 41° 20 | l 43° 50 | l 40° 82 |                                                                                                    |
|                                                                                             | 40° 51                                          | 41° 47   | 41° 73   | 41° 67   | 40° 24   | 40° 20   | 40° 97   | 41° 10   | 43° 06   | 41° 23   |                                                                                                    |
| XLII & XLI                                                                                  | l 35° 04                                        | l 35° 94 | l 34° 08 | l 36° 82 | l 35° 92 | l 36° 06 | h 35° 04 | h 36° 50 | l 33° 48 | l 36° 44 | <i>M</i> = 35''·77<br><br><i>w</i> = 7 '42<br>$\frac{1}{w}$ = 0 '13<br><i>C</i> = 67° 57' 35''·77  |
|                                                                                             | l 34° 62                                        | l 36° 22 | l 34° 62 | l 36° 38 | l 36° 24 | l 35° 16 | h 37° 28 | h 37° 30 | l 34° 24 | l 38° 08 |                                                                                                    |
|                                                                                             |                                                 |          |          |          |          |          | h 36° 12 |          |          |          |                                                                                                    |
|                                                                                             | 34° 83                                          | 36° 08   | 34° 35   | 36° 60   | 36° 08   | 35° 61   | 36° 15   | 36° 90   | 33° 86   | 37° 26   |                                                                                                    |
| XLI & XXXVIII                                                                               | l 45° 08                                        | l 46° 84 | l 47° 84 | l 43° 52 | l 46° 26 | l 45° 86 | h 43° 74 | h 44° 84 | l 46° 62 | l 44° 94 | <i>M</i> = 46''·05<br><br><i>w</i> = 3 '82<br>$\frac{1}{w}$ = 0 '26<br><i>C</i> = 80° 26' 46''·05  |
|                                                                                             | l 47° 56                                        | l 47° 70 | l 49° 04 | l 44° 66 | l 46° 44 | l 47° 72 | h 44° 36 | h 46° 16 | l 48° 06 | l 43° 48 |                                                                                                    |
|                                                                                             | l 46° 82                                        |          |          |          |          |          |          |          |          |          |                                                                                                    |
|                                                                                             | 46° 49                                          | 47° 27   | 48° 44   | 44° 09   | 46° 35   | 46° 79   | 44° 05   | 45° 50   | 47° 34   | 44° 21   |                                                                                                    |
| At XL                                                                                       |                                                 |          |          |          |          |          |          |          |          |          |                                                                                                    |
| <i>February 1851, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                 |          |          |          |          |          |          |          |          |          |                                                                                                    |
| Angle between                                                                               | Circle readings, telescope being set on XLIII   |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle              |
|                                                                                             | 0° 1'                                           | 180° 1'  | 7° 12'   | 187° 12' | 14° 25'  | 194° 25' | 21° 36'  | 201° 36' | 28° 49'  | 208° 49' |                                                                                                    |
| XLIII & XLII                                                                                | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 17''·42<br><br><i>w</i> = 24 '40<br>$\frac{1}{w}$ = 0 '04<br><i>C</i> = 54° 36' 17''·42 |
|                                                                                             | l 17° 44                                        | l 17° 16 | l 17° 02 | l 16° 96 | l 17° 78 | l 17° 72 | l 18° 36 | l 16° 46 | l 18° 36 | l 17° 48 |                                                                                                    |
|                                                                                             | l 18° 02                                        | l 17° 00 | l 16° 12 | l 16° 84 | l 17° 10 | l 18° 02 | l 17° 72 | l 17° 24 | l 18° 66 | l 16° 86 |                                                                                                    |
|                                                                                             | 17° 73                                          | 17° 08   | 16° 57   | 16° 90   | 17° 44   | 17° 87   | 18° 04   | 16° 85   | 18° 51   | 17° 17   |                                                                                                    |

## At XL—(Continued.)

February 1851, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.

| Angle between                                                                               | Circle readings, telescope being set on XLIII   |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|---------------------------------------------------------------------------------------------|-------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------------------------------|
|                                                                                             | 0° 1'                                           | 180° 1'  | 7° 12'   | 187° 12' | 14° 25'  | 194° 25' | 21° 36'  | 201° 36' | 28° 49'  | 208° 49' |                                                                                              |
| XLII & XXXIX                                                                                | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 48''·21<br><i>w</i> = 9·90<br>$\frac{1}{w}$ = 0·10<br><i>C</i> = 58° 55' 48''·21  |
|                                                                                             | l 47° 60                                        | l 47° 24 | l 47° 00 | l 48° 90 | l 49° 90 | l 48° 66 | l 47° 66 | l 47° 78 | l 47° 42 | l 49° 76 |                                                                                              |
|                                                                                             | l 47° 56                                        | l 47° 20 | l 47° 66 | l 47° 82 | l 48° 98 | l 48° 42 | l 48° 78 | l 47° 44 | l 47° 84 | l 50° 66 |                                                                                              |
|                                                                                             | 47° 58                                          | 47° 22   | 47° 33   | 48° 36   | 49° 44   | 48° 54   | 48° 22   | 47° 61   | 47° 63   | 50° 21   |                                                                                              |
| XXXIX & XXXVII                                                                              | l 24° 26                                        | l 26° 20 | l 26° 42 | l 24° 64 | l 24° 24 | l 24° 50 | l 24° 72 | l 24° 12 | l 26° 06 | l 22° 58 | <i>M</i> = 24''·60<br><i>w</i> = 18·46<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 37° 26' 24''·60 |
|                                                                                             | l 24° 40                                        | l 24° 70 | l 24° 08 | l 24° 96 | l 23° 66 | l 25° 00 | l 24° 44 | l 24° 46 | l 24° 72 | l 24° 66 |                                                                                              |
|                                                                                             |                                                 |          | l 24° 10 |          |          |          |          |          |          |          |                                                                                              |
|                                                                                             | 24° 33                                          | 25° 45   | 24° 87   | 24° 80   | 23° 95   | 24° 75   | 24° 58   | 24° 29   | 25° 39   | 23° 62   |                                                                                              |
| At XLI                                                                                      |                                                 |          |          |          |          |          |          |          |          |          |                                                                                              |
| November 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                                 |          |          |          |          |          |          |          |          |          |                                                                                              |
| Angle between                                                                               | Circle readings, telescope being set on XXXVIII |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                             | 0° 1'                                           | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                                              |
| XXXVIII & XXXIX                                                                             | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 27''·06<br><i>w</i> = 8·80<br>$\frac{1}{w}$ = 0·11<br><i>C</i> = 34° 41' 27''·06  |
|                                                                                             | l 28° 24                                        | l 25° 68 | l 26° 26 | l 25° 92 | l 27° 24 | l 29° 62 | l 28° 26 | l 26° 10 | l 26° 96 | l 26° 56 |                                                                                              |
|                                                                                             | l 27° 54                                        | l 26° 34 | l 25° 28 | l 26° 44 | l 28° 66 | l 28° 14 | l 27° 08 | l 26° 64 | l 26° 90 | l 27° 38 |                                                                                              |
|                                                                                             | 27° 89                                          | 26° 01   | 25° 77   | 26° 18   | 27° 95   | 28° 88   | 27° 67   | 26° 37   | 26° 93   | 26° 97   |                                                                                              |
| XXXIX & XLII                                                                                | l 18° 78                                        | l 18° 50 | l 20° 40 | l 20° 72 | l 21° 06 | l 19° 36 | l 19° 10 | l 20° 04 | l 19° 14 | l 20° 34 | <i>M</i> = 19''·75<br><i>w</i> = 21·30<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 54° 1' 19''·75  |
|                                                                                             | l 18° 98                                        | l 19° 08 | l 20° 82 | l 19° 26 | l 19° 64 | l 19° 78 | l 20° 06 | l 19° 24 | l 20° 24 | l 20° 50 |                                                                                              |
|                                                                                             | 18° 88                                          | 18° 79   | 20° 61   | 19° 99   | 20° 35   | 19° 57   | 19° 58   | 19° 64   | 19° 69   | 20° 42   |                                                                                              |

| At XLI—(Continued.)                                                                                                |                                                 |          |          |          |          |          |          |          |          |          |                                                                                            |
|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------------------------------------------------------------------------------|
| <i>November 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                 |                                                 |          |          |          |          |          |          |          |          |          |                                                                                            |
| Angle between                                                                                                      | Circle readings, telescope being set on XXXVIII |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                    | 0° 1'                                           | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                                            |
| XLII & XLIV                                                                                                        | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 34".23<br><i>w</i> = 6.98<br>$\frac{1}{w}$ = 0.14<br><i>C</i> = 44° 9' 34".23   |
|                                                                                                                    | l 35° 82                                        | l 35° 96 | l 32° 96 | l 33° 54 | l 33° 16 | h 32° 72 | l 34° 46 | l 33° 14 | l 35° 80 | l 34° 54 |                                                                                            |
|                                                                                                                    | l 35° 64                                        | l 35° 26 | l 33° 34 | l 35° 80 | h 33° 12 | h 32° 64 | l 32° 36 | l 33° 62 | l 34° 62 | l 34° 48 |                                                                                            |
|                                                                                                                    |                                                 |          | l 35° 28 |          |          |          | l 35° 16 |          |          |          |                                                                                            |
|                                                                                                                    | 35° 73                                          | 35° 61   | 33° 15   | 34° 87   | 33° 14   | 32° 68   | 33° 99   | 33° 38   | 35° 21   | 34° 51   |                                                                                            |
| At XLII                                                                                                            |                                                 |          |          |          |          |          |          |          |          |          |                                                                                            |
| <i>November 1850, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                 |          |          |          |          |          |          |          |          |          |                                                                                            |
| Angle between                                                                                                      | Circle readings, telescope being set on R M     |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                    | 0° 1'                                           | 180° 1'  | 7° 12'   | 187° 12' | 14° 25'  | 194° 25' | 21° 36'  | 201° 37' | 28° 49'  | 208° 49' |                                                                                            |
| R M & XXXIX                                                                                                        | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 24".20<br><i>w</i> = 16.10<br>$\frac{1}{w}$ = 0.06<br><i>C</i> = 36° 16' 24".20 |
|                                                                                                                    | l 23° 88                                        | l 24° 46 | l 22° 50 | h 24° 00 | h 24° 02 | l 25° 32 | l 24° 36 | l 23° 98 | h 24° 08 | h 24° 10 |                                                                                            |
|                                                                                                                    | l 24° 46                                        | l 23° 56 | h 22° 94 | h 23° 70 | l 24° 52 | l 25° 84 | l 25° 50 | l 24° 80 | h 23° 42 | h 24° 64 |                                                                                            |
|                                                                                                                    | 24° 17                                          | 24° 01   | 22° 72   | 23° 85   | 24° 27   | 25° 58   | 24° 93   | 24° 39   | 23° 75   | 24° 37   |                                                                                            |
| XXXIX & XL                                                                                                         | l 32° 52                                        | l 32° 74 | l 33° 76 | h 32° 96 | h 33° 94 | l 32° 14 | l 33° 62 | d 33° 03 | d 33° 91 | h 33° 00 | <i>M</i> = 33".06<br><i>w</i> = 22.20<br>$\frac{1}{w}$ = 0.05<br><i>C</i> = 77° 39' 33".06 |
|                                                                                                                    | l 32° 76                                        | l 32° 30 | h 33° 42 | h 32° 02 | l 34° 08 | l 32° 22 | l 32° 58 | d 34° 41 | d 32° 49 | h 33° 36 |                                                                                            |
|                                                                                                                    | 32° 64                                          | 32° 52   | 33° 59   | 32° 49   | 34° 01   | 32° 18   | 33° 10   | 33° 72   | 33° 20   | 33° 18   |                                                                                            |
| XL & XLIII                                                                                                         | d 27° 15                                        | d 24° 25 | d 25° 19 | d 25° 84 | l 23° 96 | l 25° 26 | l 23° 90 | d 25° 65 | d 25° 53 | d 23° 61 | <i>M</i> = 24".62<br><i>w</i> = 8.86<br>$\frac{1}{w}$ = 0.11<br><i>C</i> = 80° 54' 24".61  |
|                                                                                                                    | d 25° 05                                        | d 23° 79 | d 26° 19 | d 24° 84 | d 23° 08 | l 24° 88 | l 23° 70 | d 23° 57 | d 24° 29 | d 23° 39 |                                                                                            |
|                                                                                                                    |                                                 |          |          | d 22° 56 |          |          |          |          |          |          |                                                                                            |
|                                                                                                                    | 26° 10                                          | 24° 92   | 25° 69   | 25° 34   | 23° 20   | 25° 07   | 23° 80   | 24° 61   | 24° 91   | 23° 50   |                                                                                            |
| XLIII & XLIV                                                                                                       | d 41° 70                                        | d 44° 18 | d 41° 57 | d 43° 52 | l 43° 04 | l 42° 56 | l 43° 14 | l 41° 54 | l 43° 52 | l 44° 40 | <i>M</i> = 42".80<br><i>w</i> = 6.41<br>$\frac{1}{w}$ = 0.16<br><i>C</i> = 64° 34' 42".80  |
|                                                                                                                    | d 40° 42                                        | d 43° 66 | d 40° 53 | d 42° 30 | d 42° 16 | l 43° 08 | l 42° 84 | l 42° 44 | l 43° 80 | l 45° 40 |                                                                                            |
|                                                                                                                    |                                                 |          |          | d 42° 86 |          |          |          |          |          |          |                                                                                            |
|                                                                                                                    | 41° 06                                          | 43° 92   | 41° 05   | 42° 91   | 42° 69   | 42° 82   | 42° 99   | 41° 99   | 43° 66   | 44° 90   |                                                                                            |

| <i>At XLII—(Continued.)</i>                                                                                        |                                              |          |          |          |          |          |          |          |          |          |                                                                                              |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------------------------------|
| <i>November 1850, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                              |          |          |          |          |          |          |          |          |          |                                                                                              |
| Angle between                                                                                                      | Circle readings, telescope being set on R M  |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                    | 0° 1'                                        | 180° 1'  | 7° 12'   | 187° 12' | 14° 25'  | 194° 25' | 21° 36'  | 201° 37' | 28° 49'  | 206° 49' |                                                                                              |
| XLIV & XLI                                                                                                         | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 11'' 32<br><i>w</i> = 21 30<br>$\frac{1}{w}$ = 0 05<br><i>C</i> = 78° 50' 11'' 32 |
|                                                                                                                    | l 10° 52                                     | l 10° 48 | l 11° 66 | h 10° 28 | h 11° 58 | l 11° 08 | l 11° 46 | l 11° 58 | l 11° 92 | l 11° 10 |                                                                                              |
|                                                                                                                    | l 12° 00                                     | l 12° 18 | h 12° 12 | h 11° 42 | l 10° 22 | l 10° 80 | l 12° 92 | l 12° 02 | l 11° 34 | l 9° 78  |                                                                                              |
|                                                                                                                    | 11° 26                                       | 11° 33   | 11° 89   | 10° 85   | 10° 90   | 10° 94   | 12° 19   | 11° 80   | 11° 63   | 10° 44   |                                                                                              |
| XLI & R M                                                                                                          | l 44° 26                                     | l 44° 72 | h 44° 94 | h 44° 50 | h 44° 06 | l 43° 90 | l 43° 18 | l 43° 84 | l 43° 46 | l 43° 52 | <i>M</i> = 44'' 11<br><i>w</i> = 26 30<br>$\frac{1}{w}$ = 0 04<br><i>C</i> = 21° 44' 44'' 11 |
|                                                                                                                    | l 44° 80                                     | l 44° 62 | h 45° 36 | h 44° 32 | l 44° 40 | l 43° 64 | l 43° 00 | l 43° 66 | l 44° 02 | l 44° 02 |                                                                                              |
|                                                                                                                    | 44° 53                                       | 44° 67   | 45° 15   | 44° 41   | 44° 23   | 43° 77   | 43° 09   | 43° 75   | 43° 74   | 43° 77   |                                                                                              |
| <i>At XLIII</i>                                                                                                    |                                              |          |          |          |          |          |          |          |          |          |                                                                                              |
| <i>March 1851, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i>                           |                                              |          |          |          |          |          |          |          |          |          |                                                                                              |
| Angle between                                                                                                      | Circle readings, telescope being set on XLVI |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                    | 311° 51'                                     | 137° 52' | 325° 1'  | 145° 3'  | 332° 14' | 152° 15' | 339° 26' | 159° 27' | 346° 38' | 166° 39' |                                                                                              |
| XLVI & XLV                                                                                                         | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 53'' 96<br><i>w</i> = 10 20<br>$\frac{1}{w}$ = 0 10<br><i>C</i> = 42° 10' 53'' 96 |
|                                                                                                                    | l 55° 08                                     | l 54° 42 | l 55° 42 | l 54° 22 | l 54° 10 | l 51° 94 | l 53° 22 | l 52° 52 | l 53° 88 | l 54° 00 |                                                                                              |
|                                                                                                                    | l 54° 76                                     | l 54° 56 | l 55° 38 | l 54° 52 | l 55° 04 | l 52° 76 | l 53° 88 | l 53° 46 | l 53° 56 | l 52° 42 |                                                                                              |
|                                                                                                                    | 54° 92                                       | 54° 49   | 55° 40   | 54° 37   | 54° 57   | 52° 35   | 53° 55   | 52° 99   | 53° 72   | 53° 21   |                                                                                              |
| XLV & XLIV                                                                                                         | h 5° 54                                      | h 5° 02  | l 6° 60  | l 6° 52  | l 6° 18  | l 7° 68  | l 8° 04  | l 6° 54  | l 6° 58  | l 7° 08  | <i>M</i> = 6'' 42<br><i>w</i> = 8 50<br>$\frac{1}{w}$ = 0 12<br><i>C</i> = 30° 28' 6'' 42    |
|                                                                                                                    | h 4° 76                                      | h 4° 62  | l 5° 50  | l 6° 22  | l 6° 34  | l 6° 40  | l 8° 26  | l 7° 96  | l 5° 02  | l 7° 52  |                                                                                              |
|                                                                                                                    | 5° 15                                        | 4° 82    | 6° 05    | 6° 37    | 6° 26    | 7° 04    | 8° 15    | 7° 25    | 5° 80    | 7° 30    |                                                                                              |

| At XLIII—(Continued.)                                                                           |                                              |            |            |            |            |            |            |            |            |            |                                                                               |
|-------------------------------------------------------------------------------------------------|----------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------------------------------------------------------------------------|
| <i>March 1851, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i>        |                                              |            |            |            |            |            |            |            |            |            |                                                                               |
| Angle<br>between                                                                                | Circle readings, telescope being set on XLVI |            |            |            |            |            |            |            |            |            | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle        |
|                                                                                                 | 317° 51'                                     | 137° 52'   | 325° 1'    | 145° 3'    | 332° 14'   | 152° 15'   | 335° 26'   | 159° 27'   | 346° 38'   | 166° 35'   |                                                                               |
| XLIV &<br>XLII                                                                                  | "                                            | "          | "          | "          | "          | "          | "          | "          | "          | "          | $M$ = 53''·35<br>$w$ = 12·80<br>$\frac{1}{w}$ = 0·08<br>$C$ = 58° 34' 53''·35 |
|                                                                                                 | $h$ 53'·14                                   | $h$ 53'·90 | $l$ 52'·40 | $l$ 53'·30 | $l$ 54'·70 | $l$ 53'·50 | $l$ 51'·62 | $l$ 53'·12 | $l$ 52'·74 | $l$ 52'·20 |                                                                               |
|                                                                                                 | $h$ 54'·08                                   | $h$ 54'·22 | $l$ 53'·58 | $l$ 53'·52 | $l$ 54'·08 | $l$ 54'·90 | $l$ 52'·62 | $l$ 51'·74 | $l$ 54'·62 | $l$ 52'·92 |                                                                               |
|                                                                                                 | 53'·61                                       | 54'·06     | 52'·99     | 53'·41     | 54'·39     | 54'·20     | 52'·12     | 52'·43     | 53'·68     | 52'·56     |                                                                               |
| XLII &<br>XL                                                                                    | $h$ 23'·36                                   | $h$ 21'·82 | $l$ 21'·66 | $l$ 24'·26 | $l$ 21'·44 | $l$ 21'·22 | $l$ 20'·96 | $l$ 21'·32 | $l$ 23'·00 | $l$ 22'·74 | $M$ = 21''·52<br>$w$ = 6·75<br>$\frac{1}{w}$ = 0·15<br>$C$ = 44° 29' 21''·51  |
|                                                                                                 | $h$ 22'·12                                   | $h$ 20'·68 | $l$ 20'·78 | $l$ 23'·12 | $l$ 20'·54 | $l$ 20'·64 | $l$ 19'·12 | $l$ 20'·90 | $l$ 20'·20 | $l$ 22'·10 |                                                                               |
|                                                                                                 |                                              |            |            |            |            |            |            |            | $l$ 19'·24 |            |                                                                               |
|                                                                                                 | 22'·74                                       | 21'·25     | 21'·22     | 23'·69     | 20'·99     | 20'·93     | 20'·04     | 21'·11     | 20'·81     | 22'·42     |                                                                               |
| At XLIV                                                                                         |                                              |            |            |            |            |            |            |            |            |            |                                                                               |
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |            |            |            |            |            |            |            |            |            |                                                                               |
| Angle<br>between                                                                                | Circle readings, telescope being set on XLI  |            |            |            |            |            |            |            |            |            | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle        |
|                                                                                                 | 0° 1'                                        | 180° 2'    | 7° 12'     | 187° 13'   | 14° 24'    | 194° 25'   | 21° 36'    | 201° 37'   | 28° 48'    | 208° 49'   |                                                                               |
| XLI &<br>XLII                                                                                   | "                                            | "          | "          | "          | "          | "          | "          | "          | "          | "          | $M$ = 18''·58<br>$w$ = 10·48<br>$\frac{1}{w}$ = 0·10<br>$C$ = 57° 0' 18''·59  |
|                                                                                                 | $h$ 17'·42                                   | $h$ 18'·12 | $h$ 17'·98 | $h$ 17'·28 | $l$ 18'·52 | $l$ 19'·14 | $l$ 17'·56 | $l$ 18'·34 | $l$ 18'·60 | $l$ 19'·18 |                                                                               |
|                                                                                                 | $h$ 18'·90                                   | $h$ 18'·26 | $h$ 17'·20 | $h$ 17'·82 | $l$ 18'·00 | $l$ 20'·10 | $l$ 19'·30 | $l$ 18'·34 | $l$ 21'·28 | $l$ 20'·26 |                                                                               |
|                                                                                                 | 18'·16                                       | 18'·19     | 17'·59     | 17'·55     | 18'·26     | 19'·62     | 18'·43     | 18'·34     | 19'·95     | 19'·72     |                                                                               |
| XLII &<br>XLIII                                                                                 | $h$ 29'·28                                   | $h$ 27'·40 | $h$ 27'·98 | $h$ 29'·20 | $l$ 28'·38 | $l$ 27'·12 | $l$ 28'·56 | $l$ 27'·60 | $l$ 25'·86 | $l$ 27'·16 | $M$ = 27''·52<br>$w$ = 8·60<br>$\frac{1}{w}$ = 0·12<br>$C$ = 56° 50' 27''·52  |
|                                                                                                 | $h$ 27'·70                                   | $h$ 27'·36 | $h$ 27'·06 | $h$ 27'·32 | $l$ 29'·12 | $l$ 27'·90 | $l$ 27'·72 | $l$ 26'·20 | $l$ 24'·80 | $l$ 26'·64 |                                                                               |
|                                                                                                 |                                              |            |            |            |            |            |            |            |            |            |                                                                               |
|                                                                                                 | 28'·49                                       | 27'·38     | 27'·52     | 28'·26     | 28'·75     | 27'·51     | 28'·14     | 26'·90     | 25'·33     | 26'·90     |                                                                               |

## At XLIV—(Continued.)

March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XLI |         |        |          |         |          |         |          |         |          | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle            |
|---------------|---------------------------------------------|---------|--------|----------|---------|----------|---------|----------|---------|----------|-----------------------------------------------------------------------------------|
|               | 0° 1'                                       | 180° 2' | 7° 12' | 187° 13' | 14° 24' | 194° 25' | 21° 36' | 201° 37' | 28° 48' | 206° 49' |                                                                                   |
| XLIII & XLV   | "                                           | "       | "      | "        | "       | "        | "       | "        | "       | "        | $M = 32''95$<br>$w = 6.95$<br>$\frac{1}{w} = 0.14$<br>$C = 67^{\circ} 23' 32''97$ |
|               | h34°60                                      | h31°22  | h34°82 | h34°80   | l32°12  | l32°64   | l32°76  | l32°50   | l34°64  | l31°60   |                                                                                   |
|               | h31°28                                      | h32°56  | h32°74 | h33°34   | l31°34  | l32°10   | l32°30  | l33°98   | l35°70  | l32°76   |                                                                                   |
|               | h32°22                                      |         | h33°28 |          |         |          |         |          | l35°24  |          |                                                                                   |
|               | 32°70                                       | 31°89   | 33°61  | 34°07    | 31°73   | 32°37    | 32°53   | 33°24    | 35°19   | 32°18    |                                                                                   |
| XLV & XLVII   | h47°96                                      | h50°22  | h45°94 | h43°44   | l49°72  | l49°96   | l49°80  | l50°02   | l48°72  | l51°60   | $M = 49''07$<br>$w = 2.33$<br>$\frac{1}{w} = 0.43$<br>$C = 46^{\circ} 30' 49''07$ |
|               | h49°84                                      | h48°20  | h47°86 | h44°72   | l50°66  | l49°62   | l49°60  | l49°90   | l51°46  | l50°56   |                                                                                   |
|               | h49°90                                      |         | h47°96 |          |         |          |         |          | l50°42  |          |                                                                                   |
|               | 49°23                                       | 49°21   | 47°25  | 44°08    | 50°19   | 49°79    | 49°70   | 49°96    | 50°20   | 51°08    |                                                                                   |

## At XLV

March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on XLVII |         |        |          |         |          |         |          |         |          | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle            |
|---------------|-----------------------------------------------|---------|--------|----------|---------|----------|---------|----------|---------|----------|-----------------------------------------------------------------------------------|
|               | 0° 2'                                         | 180° 2' | 7° 12' | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 206° 48' |                                                                                   |
| XLVII & XLIV  | "                                             | "       | "      | "        | "       | "        | "       | "        | "       | "        | $M = 42''28$<br>$w = 8.14$<br>$\frac{1}{w} = 0.12$<br>$C = 61^{\circ} 21' 42''28$ |
|               | h41°18                                        | h40°54  | h42°36 | l41°84   | l42°46  | l43°30   | l44°56  | l42°50   | h43°24  | h42°68   |                                                                                   |
|               | h41°84                                        | h40°84  | h40°68 | l41°30   | l42°62  | l43°66   | l42°42  | l41°74   | h43°22  | l43°72   |                                                                                   |
|               |                                               |         |        |          |         |          | h40°34  |          |         |          |                                                                                   |
|               | 41°51                                         | 40°69   | 41°52  | 41°57    | 42°54   | 43°48    | 43°49   | 41°53    | 43°23   | 43°20    |                                                                                   |
| XLIV & XLIII  | h23°14                                        | h22°80  | h23°54 | l21°80   | l21°84  | l22°08   | l22°62  | l22°10   | h22°00  | h23°28   | $M = 22''61$<br>$w = 15.50$<br>$\frac{1}{w} = 0.06$<br>$C = 82^{\circ} 8' 22''61$ |
|               | h22°62                                        | h22°52  | h24°48 | l22°64   | l21°86  | l21°88   | l24°14  | l23°64   | h21°44  | l21°50   |                                                                                   |
|               |                                               |         |        |          |         |          |         | h23°14   |         |          |                                                                                   |
|               | 22°88                                         | 22°66   | 24°01  | 22°22    | 21°85   | 21°98    | 23°38   | 22°96    | 21°72   | 22°39    |                                                                                   |

## KARACHI LONGITUDINAL SERIES.

| At XLV—(Continued.)                                                                                          |                                                |          |          |          |          |          |          |          |          |          |                                                                           |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------|
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>              |                                                |          |          |          |          |          |          |          |          |          |                                                                           |
| Angle between                                                                                                | Circle readings, telescope being set on XLVII  |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle          |
|                                                                                                              | 0° 2'                                          | 180° 2'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 206° 48' |                                                                           |
| XLIII & XLVI                                                                                                 | "                                              | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 44''·56<br>w = 14 ·41<br>$\frac{1}{w}$ = 0 ·07<br>C = 48° 47' 44''·57 |
|                                                                                                              | h 44'·62                                       | h 44'·24 | h 43'·68 | l 45'·94 | l 45'·12 | l 44'·60 | l 43'·74 | l 46'·48 | h 42'·68 | h 44'·32 |                                                                           |
|                                                                                                              | h 45'·36                                       | h 43'·72 | h 43'·24 | l 45'·06 | l 44'·96 | l 44'·18 | l 44'·58 | l 45'·02 | h 45'·34 | l 44'·28 |                                                                           |
|                                                                                                              |                                                |          |          |          |          |          | h 45'·90 |          |          |          |                                                                           |
|                                                                                                              | 44'·99                                         | 43'·98   | 43'·46   | 45'·50   | 45'·04   | 44'·39   | 44'·16   | 45'·80   | 44'·01   | 44'·30   |                                                                           |
| XLVI & XLVIII                                                                                                | h 11'·82                                       | h 11'·42 | h 12'·78 | l 12'·60 | l 12'·06 | l 11'·64 | l 11'·62 | l 9'·48  | h 11'·12 | l 11'·66 | M = 11''·81<br>w = 18 ·03<br>$\frac{1}{w}$ = 0 ·06<br>C = 32° 16' 11''·80 |
|                                                                                                              | h 12'·24                                       | h 11'·48 | h 12'·36 | l 12'·32 | l 12'·60 | l 13'·34 | l 11'·24 | l 11'·40 | h 11'·56 | l 11'·38 |                                                                           |
|                                                                                                              |                                                |          |          |          |          |          | h 10'·52 |          |          |          |                                                                           |
|                                                                                                              | 12'·03                                         | 11'·45   | 12'·57   | 12'·46   | 12'·33   | 12'·49   | 11'·43   | 10'·47   | 11'·34   | 11'·52   |                                                                           |
| XLVIII & XLIX                                                                                                | h 56'·08                                       | h 56'·84 | h 53'·74 | l 53'·72 | l 54'·76 | l 55'·54 | l 55'·78 | l 57'·84 | h 54'·48 | l 55'·72 | M = 55''·41<br>w = 9 ·56<br>$\frac{1}{w}$ = 0 ·10<br>C = 61° 43' 55''·42  |
|                                                                                                              | h 54'·12                                       | h 56'·96 | h 54'·30 | l 55'·44 | l 55'·62 | l 54'·98 | l 54'·46 | l 55'·70 | h 55'·50 | l 57'·24 |                                                                           |
|                                                                                                              | h 55'·06                                       |          |          |          |          |          | h 55'·80 |          |          |          |                                                                           |
|                                                                                                              | 55'·09                                         | 56'·90   | 54'·02   | 54'·58   | 55'·19   | 55'·26   | 55'·12   | 56'·45   | 54'·99   | 56'·48   |                                                                           |
| XLIX & XLVII                                                                                                 | h 1'·32                                        | h 4'·54  | h 4'·50  | l 3'·28  | l 3'·50  | l 2'·80  | l 2'·52  | l 1'·88  | h 2'·78  | l 2'·44  | M = 3''·26<br>w = 9 ·56<br>$\frac{1}{w}$ = 0 ·10<br>C = 73° 42' 3''·25    |
|                                                                                                              | h 4'·20                                        | h 4'·76  | h 5'·34  | l 1'·46  | l 3'·08  | l 2'·64  | l 4'·38  | l 2'·70  | h 3'·48  | l 2'·20  |                                                                           |
|                                                                                                              | h 4'·30                                        |          |          |          |          |          | h 2'·98  |          |          |          |                                                                           |
|                                                                                                              | 3'·27                                          | 4'·65    | 4'·92    | 2'·37    | 3'·29    | 2'·72    | 3'·45    | 2'·52    | 3'·13    | 2'·32    |                                                                           |
| At XLVI                                                                                                      |                                                |          |          |          |          |          |          |          |          |          |                                                                           |
| <i>March and November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |          |          |          |          |          |          |          |          |          |                                                                           |
| Angle between                                                                                                | Circle readings, telescope being set on XLVIII |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle          |
|                                                                                                              | 0° 1'                                          | 180° 1'  | 7° 12'   | 187° 13' | 14° 24'  | 194° 25' | 21° 36'  | 201° 37' | 28° 48'  | 206° 48' |                                                                           |
| XLVIII & XLV                                                                                                 | "                                              | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 11''·05<br>w = 14 ·25<br>$\frac{1}{w}$ = 0 ·07<br>C = 65° 15' 11''·05 |
|                                                                                                              | h 10'·46                                       | h 10'·22 | h 11'·44 | h 11'·62 | l 11'·08 | h 9'·48  | h 12'·52 | h 11'·38 | h 11'·90 | h 12'·22 |                                                                           |
|                                                                                                              | h 10'·22                                       | h 10'·64 | h 10'·14 | h 10'·46 | l 10'·16 | h 11'·76 | h 13'·14 | h 10'·46 | h 10'·46 | h 10'·88 |                                                                           |
|                                                                                                              |                                                |          |          |          | h 11'·22 |          |          |          |          |          |                                                                           |
|                                                                                                              | 10'·34                                         | 10'·43   | 10'·79   | 11'·04   | 10'·62   | 10'·82   | 12'·83   | 10'·92   | 11'·18   | 11'·55   |                                                                           |



| <i>At XLVI—(Continued.)</i>                                                                                  |                                                |         |          |          |          |          |          |          |          |          |                                                                                              |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------------------------------|
| <i>March and November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |         |          |          |          |          |          |          |          |          |                                                                                              |
| Angle between                                                                                                | Circle readings, telescope being set on XLVIII |         |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                              | 0° 1'                                          | 180° 1' | 7° 12'   | 187° 13' | 14° 24'  | 194° 25' | 21° 36'  | 201° 37' | 28° 48'  | 206° 48' |                                                                                              |
| XLV & XLIII                                                                                                  | "                                              | "       | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 23''·70<br><i>w</i> = 7·14<br>$\frac{1}{w}$ = 0·14<br><i>C</i> = 89° 1' 23''·70   |
|                                                                                                              | h23·74                                         | h23·30  | h22·64   | h22·52   | l26·24   | h25·50   | h24·08   | h24·12   | h22·56   | h23·00   |                                                                                              |
|                                                                                                              | h23·50                                         | h22·08  | h22·26   | h23·50   | l26·22   | h22·62   | h24·78   | h24·28   | h23·52   | h23·36   |                                                                                              |
|                                                                                                              | 23·62                                          | 22·69   | 22·45    | 23·01    | 26·23    | 24·15    | 24·43    | 24·20    | 23·04    | 23·18    |                                                                                              |
| <i>At XLVII</i>                                                                                              |                                                |         |          |          |          |          |          |          |          |          |                                                                                              |
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>              |                                                |         |          |          |          |          |          |          |          |          |                                                                                              |
| Angle between                                                                                                | Circle readings, telescope being set on XLIV   |         |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                              | 174° 1'                                        | 354° 2' | 181° 12' | 1° 13'   | 188° 24' | 6° 25'   | 195° 35' | 15° 37'  | 202° 47' | 22° 49'  |                                                                                              |
| XLIV & XLV                                                                                                   | "                                              | "       | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 28''·39<br><i>w</i> = 8·54<br>$\frac{1}{w}$ = 0·12<br><i>C</i> = 72° 7' 28''·39   |
|                                                                                                              | h29·00                                         | h27·28  | h27·02   | h27·68   | h27·68   | h29·02   | h28·72   | h27·08   | l29·72   | l30·60   |                                                                                              |
|                                                                                                              | h29·38                                         | h28·86  | h27·00   | h28·00   | h27·42   | h29·80   | h27·96   | h28·68   | l27·76   | l30·18   |                                                                                              |
|                                                                                                              | 29·19                                          | 28·07   | 27·01    | 27·84    | 27·55    | 29·41    | 28·34    | 27·88    | 28·22    | 30·39    |                                                                                              |
| XLV & XLIX                                                                                                   | h31·62                                         | h33·54  | h33·32   | h33·54   | h33·82   | h32·26   | h31·86   | h31·06   | l33·20   | l29·06   | <i>M</i> = 32''·10<br><i>w</i> = 5·72<br>$\frac{1}{w}$ = 0·17<br><i>C</i> = 59° 0' 32''·10   |
|                                                                                                              | h32·22                                         | h32·58  | h33·88   | h32·20   | h33·10   | h30·64   | h32·62   | h31·20   | l31·10   | l29·82   |                                                                                              |
|                                                                                                              |                                                |         |          |          |          |          |          |          | l31·12   |          |                                                                                              |
|                                                                                                              | 31·92                                          | 33·06   | 33·60    | 32·87    | 33·46    | 31·45    | 32·24    | 31·13    | 31·81    | 29·44    |                                                                                              |
| XLIX & L                                                                                                     | h39·74                                         | h37·68  | h38·78   | h37·06   | h38·22   | h36·78   | h38·24   | h38·60   | l36·52   | l39·52   | <i>M</i> = 38''·16<br><i>w</i> = 15·10<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 54° 52' 38''·16 |
|                                                                                                              | h38·78                                         | h37·56  | h39·60   | h38·20   | h37·92   | h37·90   | h37·10   | h38·30   | l39·76   | l37·40   |                                                                                              |
|                                                                                                              |                                                |         |          |          |          |          |          |          | l37·96   | l37·86   |                                                                                              |
|                                                                                                              | 39·26                                          | 37·62   | 39·19    | 37·63    | 38·07    | 37·34    | 37·67    | 38·45    | 38·08    | 38·26    |                                                                                              |

| At XLVIII                                                                                       |                                               |           |           |           |           |           |           |           |           |           |                                                                                              |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------------------------------------------------------------------------------|
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |           |           |           |           |           |           |           |           |           |                                                                                              |
| Angle between                                                                                   | Circle readings, telescope being set on LI    |           |           |           |           |           |           |           |           |           | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                 | 307° 20'                                      | 127° 20'  | 314° 31'  | 134° 31'  | 321° 48'  | 141° 43'  | 328° 55'  | 148° 55'  | 336° 7'   | 156° 7'   |                                                                                              |
| LI & XLIX                                                                                       | "                                             | "         | "         | "         | "         | "         | "         | "         | "         | "         | <i>M</i> = 23''·77<br><i>w</i> = 6·33<br>$\frac{1}{w}$ = 0·16<br><i>C</i> = 52° 41' 23''·77  |
|                                                                                                 | l 23° 58'                                     | l 23° 60' | l 25° 34' | l 24° 48' | l 24° 48' | l 21° 66' | l 22° 54' | l 23° 22' | h 22° 84' | h 23° 76' |                                                                                              |
|                                                                                                 | l 23° 80'                                     | l 23° 34' | l 27° 36' | l 24° 22' | l 24° 36' | l 21° 92' | l 24° 82' | l 24° 14' | h 23° 52' | h 22° 02' |                                                                                              |
|                                                                                                 | 23° 69'                                       | 23° 47'   | 26° 35'   | 24° 35'   | 24° 42'   | 21° 79'   | 23° 88'   | 23° 68'   | 23° 18'   | 22° 89'   |                                                                                              |
| XLIX & XLV                                                                                      | h 43° 22'                                     | h 43° 34' | h 41° 72' | h 44° 24' | l 44° 68' | l 44° 76' | l 45° 50' | l 43° 86' | l 44° 04' | l 44° 28' | <i>M</i> = 43''·93<br><i>w</i> = 9·33<br>$\frac{1}{w}$ = 0·11<br><i>C</i> = 48° 15' 43''·93  |
|                                                                                                 | h 43° 36'                                     | h 42° 92' | h 42° 48' | h 43° 98' | l 41° 92' | l 44° 20' | l 45° 70' | l 44° 98' | l 44° 56' | l 44° 66' |                                                                                              |
|                                                                                                 | 43° 29'                                       | 43° 13'   | 42° 10'   | 44° 11'   | 43° 35'   | 44° 48'   | 45° 60'   | 44° 42'   | 44° 30'   | 44° 47'   |                                                                                              |
| XLV & XLVI                                                                                      | h 39° 36'                                     | h 39° 34' | h 39° 74' | h 38° 46' | l 38° 50' | l 38° 94' | l 38° 36' | l 38° 20' | l 39° 76' | l 39° 10' | <i>M</i> = 39''·03<br><i>w</i> = 11·67<br>$\frac{1}{w}$ = 0·09<br><i>C</i> = 82° 28' 39''·04 |
|                                                                                                 | h 40° 60'                                     | h 39° 94' | h 41° 30' | h 37° 38' | l 39° 38' | l 39° 04' | l 38° 36' | l 37° 26' | l 40° 06' | l 38° 48' |                                                                                              |
|                                                                                                 | 39° 98'                                       | 39° 64'   | 40° 08'   | 37° 92'   | 38° 94'   | 38° 99'   | 38° 36'   | 37° 73'   | 39° 91'   | 38° 79'   |                                                                                              |
| At XLIX                                                                                         |                                               |           |           |           |           |           |           |           |           |           |                                                                                              |
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |           |           |           |           |           |           |           |           |           |                                                                                              |
| Angle between                                                                                   | Circle readings, telescope being set on XLVII |           |           |           |           |           |           |           |           |           | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                 | 0° 1'                                         | 180° 1'   | 7° 12'    | 187° 12'  | 14° 24'   | 194° 24'  | 21° 36'   | 201° 36'  | 28° 48'   | 208° 48'  |                                                                                              |
| XLVII & XLV                                                                                     | "                                             | "         | "         | "         | "         | "         | "         | "         | "         | "         | <i>M</i> = 25''·59<br><i>w</i> = 13·20<br>$\frac{1}{w}$ = 0·08<br><i>C</i> = 47° 17' 25''·59 |
|                                                                                                 | h 25° 32'                                     | h 23° 72' | l 24° 80' | l 24° 34' | h 27° 12' | h 26° 92' | l 27° 32' | h 25° 48' | h 24° 32' | h 25° 38' |                                                                                              |
|                                                                                                 | h 24° 86'                                     | h 25° 16' | l 25° 68' | l 25° 50' | h 26° 62' | h 25° 84' | l 25° 42' | h 25° 44' | h 26° 34' | h 26° 26' |                                                                                              |
|                                                                                                 | 25° 09'                                       | 24° 44'   | 25° 24'   | 24° 92'   | 26° 87'   | 26° 38'   | 26° 37'   | 25° 46'   | 25° 33'   | 25° 82'   |                                                                                              |
| XLV & XLVIII                                                                                    | h 22° 48'                                     | h 21° 68' | l 21° 30' | l 22° 18' | h 20° 60' | h 20° 32' | l 21° 94' | h 20° 36' | h 21° 84' | h 21° 80' | <i>M</i> = 21''·16<br><i>w</i> = 22·20<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 70° 0' 21''·16  |
|                                                                                                 | h 21° 56'                                     | h 19° 92' | l 20° 92' | l 20° 94' | h 21° 18' | h 21° 02' | l 19° 52' | h 20° 78' | h 20° 88' | h 22° 02' |                                                                                              |
|                                                                                                 | 22° 02'                                       | 20° 80'   | 21° 11'   | 21° 56'   | 20° 89'   | 20° 67'   | 20° 73'   | 20° 57'   | 21° 36'   | 21° 91'   |                                                                                              |

| At XLIX—(Continued.)                                                                            |                                               |         |         |          |         |          |         |          |         |          |                                                                                              |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|----------|----------------------------------------------------------------------------------------------|
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |         |         |          |         |          |         |          |         |          |                                                                                              |
| Angle between                                                                                   | Circle readings, telescope being set on XLVII |         |         |          |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                 | 0° 1'                                         | 180° 1' | 7° 12'  | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 206° 48' |                                                                                              |
| XLVIII & LI                                                                                     | "                                             | "       | "       | "        | "       | "        | "       | "        | "       | "        | <i>M</i> = 7''·13<br><i>w</i> = 20·00<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 70° 17' 7''·13   |
|                                                                                                 | h 8·26                                        | h 6·68  | l 5·76  | l 6·92   | h 7·48  | h 6·96   | l 7·32  | h 7·86   | h 8·04  | h 7·32   |                                                                                              |
|                                                                                                 | h 6·62                                        | h 8·20  | l 7·12  | l 6·22   | h 5·82  | h 7·32   | l 7·36  | h 8·52   | h 6·92  | h 5·88   |                                                                                              |
|                                                                                                 | 7·44                                          | 7·44    | 6·44    | 6·57     | 6·65    | 7·14     | 7·34    | 8·19     | 7·48    | 6·60     |                                                                                              |
| LI & LII                                                                                        | h 27·32                                       | h 27·54 | l 28·78 | l 26·14  | h 21·92 | h 25·92  | l 24·30 | h 26·40  | h 25·98 | h 24·66  | <i>M</i> = 26''·37<br><i>w</i> = 6·46<br>$\frac{1}{w}$ = 0·15<br><i>C</i> = 52° 58' 26''·34  |
|                                                                                                 | h 28·16                                       | h 26·52 | l 27·18 | l 27·40  | h 25·28 | h 25·98  | l 27·34 | h 26·14  | h 25·10 | h 27·10  |                                                                                              |
|                                                                                                 |                                               |         |         | h 26·96  |         | l 25·92  |         |          |         |          |                                                                                              |
|                                                                                                 | 27·74                                         | 27·03   | 27·98   | 26·77    | 24·72   | 25·95    | 25·85   | 26·27    | 25·54   | 25·88    |                                                                                              |
| LII & L                                                                                         | h 41·30                                       | h 43·48 | l 42·98 | l 44·98  | h 46·64 | h 45·44  | l 43·58 | h 44·12  | h 42·92 | h 43·48  | <i>M</i> = 43''·97<br><i>w</i> = 5·81<br>$\frac{1}{w}$ = 0·17<br><i>C</i> = 55° 41' 43''·97  |
|                                                                                                 | h 42·74                                       | h 43·78 | l 43·14 | l 44·10  | h 46·68 | h 45·00  | l 43·76 | h 43·40  | h 45·16 | h 43·04  |                                                                                              |
|                                                                                                 |                                               |         |         |          |         |          |         | h 43·44  |         |          |                                                                                              |
|                                                                                                 | 42·02                                         | 43·63   | 43·06   | 44·54    | 46·66   | 45·22    | 43·67   | 43·76    | 43·84   | 43·26    |                                                                                              |
| L & XLVII                                                                                       | h 56·80                                       | h 56·10 | l 56·22 | l 54·80  | h 56·02 | h 54·64  | l 58·62 | h 55·76  | h 56·38 | h 56·34  | <i>M</i> = 55''·96<br><i>w</i> = 17·37<br>$\frac{1}{w}$ = 0·06<br><i>C</i> = 63° 44' 55''·97 |
|                                                                                                 | h 56·54                                       | h 56·26 | l 56·52 | l 55·52  | h 55·60 | h 54·58  | l 56·06 | h 55·84  | h 55·76 | h 55·90  |                                                                                              |
|                                                                                                 |                                               |         |         |          |         | l 55·76  |         |          |         |          |                                                                                              |
|                                                                                                 | 56·67                                         | 56·18   | 56·37   | 55·16    | 55·81   | 54·61    | 56·81   | 55·80    | 56·07   | 56·12    |                                                                                              |
| At L                                                                                            |                                               |         |         |          |         |          |         |          |         |          |                                                                                              |
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |         |         |          |         |          |         |          |         |          |                                                                                              |
| Angle between                                                                                   | Circle readings, telescope being set on XLVII |         |         |          |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                 | 0° 1'                                         | 180° 1' | 7° 12'  | 187° 12' | 14° 24' | 194° 25' | 21° 36' | 201° 36' | 28° 48' | 206° 48' |                                                                                              |
| XLVII & XLIX                                                                                    | "                                             | "       | "       | "        | "       | "        | "       | "        | "       | "        | <i>M</i> = 27''·06<br><i>w</i> = 7·58<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 61° 22' 27''·08  |
|                                                                                                 | h 26·76                                       | h 26·24 | h 26·14 | h 26·78  | h 27·44 | h 26·70  | l 28·76 | l 27·86  | l 30·72 | l 28·58  |                                                                                              |
|                                                                                                 | h 25·80                                       | h 26·48 | h 24·80 | h 26·18  | h 26·64 | l 27·70  | l 27·40 | l 26·06  | l 26·14 | l 27·68  |                                                                                              |
|                                                                                                 |                                               |         |         |          |         |          |         | l 28·80  |         |          |                                                                                              |
|                                                                                                 | 26·28                                         | 26·36   | 25·47   | 26·48    | 27·04   | 27·20    | 28·08   | 26·96    | 28·55   | 28·13    |                                                                                              |

| <i>At L—(Continued.)</i>                                                                        |                                               |                |                |                |                |                |                |                |                |                |                                                                                           |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------------------------------------------------------------------------------|
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                |                |                |                |                |                |                |                |                |                                                                                           |
| Angle<br>between                                                                                | Circle readings, telescope being set on XLVII |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                 | 0° 1'                                         | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 25'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                           |
| XLIX &<br>LII                                                                                   | "                                             | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 6° 71<br><i>w</i> = 11 99<br>$\frac{1}{w}$ = 0 08<br><i>C</i> = 61° 48' 6" 71  |
|                                                                                                 | <i>h</i> 5'30                                 | <i>h</i> 7'32  | <i>h</i> 7'66  | <i>h</i> 7'00  | <i>h</i> 6'32  | <i>h</i> 6'02  | <i>l</i> 4'90  | <i>l</i> 7'52  | <i>l</i> 5'82  | <i>l</i> 5'26  |                                                                                           |
|                                                                                                 | <i>h</i> 7'10                                 | <i>h</i> 6'04  | <i>h</i> 7'88  | <i>h</i> 7'02  | <i>h</i> 7'84  | <i>h</i> 6'34  | <i>l</i> 5'78  | <i>l</i> 8'60  | <i>l</i> 6'84  | <i>l</i> 6'90  |                                                                                           |
|                                                                                                 | 6'54                                          | 6'68           | 7'77           | 7'01           | 7'08           | 6'18           | 5'34           | 8'06           | 6'33           | 6'08           |                                                                                           |
| <i>At LI</i>                                                                                    |                                               |                |                |                |                |                |                |                |                |                |                                                                                           |
| <i>April 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                |                |                |                |                |                |                |                |                |                                                                                           |
| Angle<br>between                                                                                | Circle readings, telescope being set on LIV   |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                 | 0° 1'                                         | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                           |
| LIV &<br>LIII                                                                                   | "                                             | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 55" 31<br><i>w</i> = 2 72<br>$\frac{1}{w}$ = 0 37<br><i>C</i> = 62° 31' 55" 31 |
|                                                                                                 | <i>h</i> 55'30                                | <i>h</i> 52'84 | <i>l</i> 55'44 | <i>l</i> 55'76 | <i>l</i> 55'40 | <i>l</i> 57'52 | <i>h</i> 51'38 | <i>h</i> 53'80 | <i>l</i> 57'62 | <i>l</i> 57'44 |                                                                                           |
|                                                                                                 | <i>h</i> 53'38                                | <i>h</i> 54'74 | <i>l</i> 55'72 | <i>l</i> 54'98 | <i>l</i> 53'84 | <i>l</i> 58'20 | <i>h</i> 51'82 | <i>h</i> 56'16 | <i>l</i> 56'74 | <i>l</i> 56'72 |                                                                                           |
|                                                                                                 | <i>h</i> 54'56                                |                |                |                |                |                | <i>h</i> 56'78 |                |                |                |                                                                                           |
|                                                                                                 | 54'41                                         | 53'79          | 55'58          | 55'37          | 54'62          | 57'86          | 51'60          | 55'58          | 57'18          | 57'08          |                                                                                           |
| LIII &<br>LII                                                                                   | <i>h</i> 26'68                                | <i>h</i> 27'76 | <i>l</i> 26'02 | <i>l</i> 25'78 | <i>l</i> 26'30 | <i>l</i> 23'68 | <i>h</i> 29'72 | <i>h</i> 27'16 | <i>l</i> 24'58 | <i>l</i> 26'86 | <i>M</i> = 25" 40<br><i>w</i> = 3 76<br>$\frac{1}{w}$ = 0 27<br><i>C</i> = 65° 22' 25" 37 |
|                                                                                                 | <i>h</i> 26'88                                | <i>h</i> 26'26 | <i>l</i> 23'32 | <i>l</i> 24'64 | <i>l</i> 23'50 | <i>l</i> 20'76 | <i>h</i> 25'50 | <i>h</i> 25'54 | <i>l</i> 23'60 | <i>l</i> 25'00 |                                                                                           |
|                                                                                                 |                                               |                | <i>l</i> 23'78 |                | <i>l</i> 24'58 | <i>l</i> 23'52 | <i>h</i> 25'12 |                |                |                |                                                                                           |
|                                                                                                 | 26'78                                         | 27'01          | 24'37          | 25'21          | 24'79          | 22'65          | 26'78          | 26'35          | 24'09          | 25'93          |                                                                                           |
| LII &<br>XLIX                                                                                   | <i>h</i> 21'18                                | <i>h</i> 23'12 | <i>l</i> 20'04 | <i>l</i> 22'16 | <i>l</i> 21'40 | <i>l</i> 23'06 | <i>h</i> 22'62 | <i>h</i> 23'06 | <i>l</i> 20'86 | <i>l</i> 21'36 | <i>M</i> = 22" 30<br><i>w</i> = 9 90<br>$\frac{1}{w}$ = 0 10<br><i>C</i> = 59° 7' 22" 30  |
|                                                                                                 | <i>h</i> 20'76                                | <i>h</i> 23'18 | <i>l</i> 21'94 | <i>l</i> 23'04 | <i>l</i> 22'90 | <i>l</i> 24'52 | <i>h</i> 22'92 | <i>h</i> 22'58 | <i>l</i> 22'70 | <i>l</i> 22'64 |                                                                                           |
|                                                                                                 |                                               |                |                |                |                |                |                |                |                |                |                                                                                           |
|                                                                                                 | 20'97                                         | 23'15          | 20'99          | 22'60          | 22'15          | 23'79          | 22'77          | 22'82          | 21'78          | 22'00          |                                                                                           |

| <i>At LI—(Continued.)</i>                                                                       |                                             |                |                |                |                |                |                |                |                |                |                                                                                           |
|-------------------------------------------------------------------------------------------------|---------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------------------------------------------------------------------------------|
| <i>April 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                |                |                                                                                           |
| Angle<br>between                                                                                | Circle readings, telescope being set on LIV |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                 | 0° 1'                                       | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                           |
| XLIX &<br>XLVIII                                                                                | "                                           | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 30".35<br><i>w</i> = 6.92<br>$\frac{1}{w}$ = 0.14<br><i>C</i> = 57° 1' 30".35  |
|                                                                                                 | <i>h</i> 29.76                              | <i>h</i> 28.58 | <i>l</i> 31.76 | <i>l</i> 29.52 | <i>l</i> 31.14 | <i>l</i> 28.44 | <i>h</i> 30.48 | <i>h</i> 30.76 | <i>l</i> 32.02 | <i>l</i> 30.36 |                                                                                           |
|                                                                                                 | <i>h</i> 29.70                              | <i>h</i> 27.74 | <i>l</i> 32.44 | <i>l</i> 29.80 | <i>l</i> 31.40 | <i>l</i> 30.82 | <i>h</i> 30.38 | <i>h</i> 30.32 | <i>l</i> 30.72 | <i>l</i> 31.32 |                                                                                           |
|                                                                                                 | 29.73                                       | 28.16          | 32.10          | 29.66          | 31.27          | 29.41          | 30.43          | 30.54          | 31.37          | 30.84          |                                                                                           |
| <i>At LII</i>                                                                                   |                                             |                |                |                |                |                |                |                |                |                |                                                                                           |
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                |                |                                                                                           |
| Angle<br>between                                                                                | Circle readings, telescope being set on L   |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                 | 0° 1'                                       | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                           |
| L &<br>XLIX                                                                                     | "                                           | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 11".34<br><i>w</i> = 6.82<br>$\frac{1}{w}$ = 0.15<br><i>C</i> = 62° 30' 11".33 |
|                                                                                                 | <i>h</i> 9.96                               | <i>h</i> 9.88  | <i>l</i> 11.80 | <i>l</i> 11.30 | <i>l</i> 14.38 | <i>l</i> 11.64 | <i>h</i> 11.78 | <i>h</i> 10.98 | <i>h</i> 11.36 | <i>l</i> 10.32 |                                                                                           |
|                                                                                                 | <i>h</i> 11.12                              | <i>h</i> 11.88 | <i>l</i> 12.42 | <i>l</i> 10.54 | <i>l</i> 12.96 | <i>l</i> 12.78 | <i>h</i> 11.10 | <i>h</i> 9.96  | <i>h</i> 9.00  | <i>l</i> 10.60 |                                                                                           |
|                                                                                                 | 10.54                                       | 10.39          | 12.11          | 10.92          | 13.67          | 12.21          | 11.44          | 10.47          | 11.15          | 10.46          |                                                                                           |
| XLIX &<br>LI                                                                                    | <i>l</i> 11.54                              | <i>h</i> 10.60 | <i>l</i> 10.22 | <i>l</i> 10.28 | <i>l</i> 9.44  | <i>l</i> 11.74 | <i>h</i> 12.24 | <i>h</i> 10.56 | <i>h</i> 13.12 | <i>l</i> 12.96 | <i>M</i> = 11".29<br><i>w</i> = 7.65<br>$\frac{1}{w}$ = 0.13<br><i>C</i> = 67° 54' 11".30 |
|                                                                                                 | <i>l</i> 14.00                              | <i>h</i> 10.78 | <i>l</i> 11.52 | <i>l</i> 11.80 | <i>l</i> 9.04  | <i>l</i> 10.38 | <i>h</i> 12.36 | <i>h</i> 10.70 | <i>h</i> 11.44 | <i>l</i> 11.38 |                                                                                           |
|                                                                                                 | <i>l</i> 12.30                              |                |                |                |                |                |                |                |                |                |                                                                                           |
|                                                                                                 | 12.61                                       | 10.69          | 10.87          | 11.04          | 9.24           | 11.06          | 12.30          | 10.63          | 12.28          | 12.17          |                                                                                           |
| LI &<br>LIII                                                                                    | <i>l</i> 57.50                              | <i>h</i> 58.04 | <i>l</i> 58.14 | <i>l</i> 59.94 | <i>l</i> 59.38 | <i>l</i> 58.26 | <i>h</i> 59.54 | <i>h</i> 60.28 | <i>h</i> 57.46 | <i>l</i> 58.58 | <i>M</i> = 58".74<br><i>w</i> = 6.52<br>$\frac{1}{w}$ = 0.15<br><i>C</i> = 55° 22' 58".74 |
|                                                                                                 | <i>l</i> 56.28                              | <i>l</i> 55.78 | <i>l</i> 58.88 | <i>l</i> 57.96 | <i>l</i> 61.36 | <i>l</i> 58.86 | <i>h</i> 58.88 | <i>h</i> 60.30 | <i>h</i> 58.64 | <i>l</i> 59.64 |                                                                                           |
|                                                                                                 |                                             | <i>l</i> 57.60 |                | <i>l</i> 60.30 | <i>l</i> 59.86 |                |                |                |                |                |                                                                                           |
|                                                                                                 | 56.89                                       | 57.14          | 58.51          | 59.40          | 60.20          | 58.56          | 59.21          | 60.29          | 58.05          | 59.11          |                                                                                           |

| At LII—(Continued.)                                                                                |                                             |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                   |                                                                                                    |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <i>March 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>    |                                             |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                   |                                                                                                    |
| Angle<br>between                                                                                   | Circle readings, telescope being set on L   |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                   | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                             |
|                                                                                                    | 0° 1'                                       | 180° 1'            | 7° 12'             | 187° 12'           | 14° 24'            | 194° 24'           | 21° 36'            | 201° 36'           | 28° 48'            | 208° 48'                                                                                          |                                                                                                    |
| LIII &<br>LV                                                                                       | "                                           | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                                                                                                 | $M = 17''\cdot86$<br>$w = 16\cdot28$<br>$\frac{1}{w} = 0\cdot06$<br>$C = 54^\circ 14' 17''\cdot86$ |
|                                                                                                    | $h_{19}^{\cdot}16$                          | $h_{18}^{\cdot}86$ | $l_{19}^{\cdot}30$ | $l_{16}^{\cdot}68$ | $l_{16}^{\cdot}88$ | $l_{17}^{\cdot}26$ | $h_{17}^{\cdot}80$ | $h_{16}^{\cdot}74$ | $h_{18}^{\cdot}28$ | $l_{18}^{\cdot}26$                                                                                |                                                                                                    |
|                                                                                                    | $h_{17}^{\cdot}44$                          | $h_{18}^{\cdot}72$ | $l_{16}^{\cdot}70$ | $l_{18}^{\cdot}62$ | $l_{16}^{\cdot}86$ | $l_{18}^{\cdot}14$ | $h_{17}^{\cdot}64$ | $h_{16}^{\cdot}90$ | $h_{18}^{\cdot}50$ | $l_{18}^{\cdot}76$                                                                                |                                                                                                    |
|                                                                                                    |                                             |                    | $l_{17}^{\cdot}40$ |                    |                    |                    |                    |                    |                    |                                                                                                   |                                                                                                    |
|                                                                                                    | 18° 30'                                     | 18° 79'            | 17° 80'            | 17° 65'            | 16° 87'            | 17° 70'            | 17° 72'            | 16° 82'            | 18° 39'            | 18° 51'                                                                                           |                                                                                                    |
| At LIII                                                                                            |                                             |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                   |                                                                                                    |
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                   |                                                                                                    |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LII |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                   | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                             |
|                                                                                                    | 0° 1'                                       | 180° 1'            | 7° 12'             | 187° 12'           | 14° 24'            | 194° 24'           | 21° 36'            | 201° 36'           | 28° 48'            | 208° 48'                                                                                          |                                                                                                    |
| LII &<br>LI                                                                                        | "                                           | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                                                                                                 | $M = 37''\cdot46$<br>$w = 10\cdot20$<br>$\frac{1}{w} = 0\cdot10$<br>$C = 59^\circ 14' 37''\cdot46$ |
|                                                                                                    | $l_{38}^{\cdot}54$                          | $l_{36}^{\cdot}86$ | $h_{36}^{\cdot}74$ | $h_{36}^{\cdot}52$ | $h_{37}^{\cdot}62$ | $l_{38}^{\cdot}58$ | $h_{38}^{\cdot}78$ | $h_{36}^{\cdot}36$ | $h_{38}^{\cdot}56$ | $h_{37}^{\cdot}36$                                                                                |                                                                                                    |
|                                                                                                    | $l_{37}^{\cdot}00$                          | $l_{37}^{\cdot}12$ | $h_{37}^{\cdot}64$ | $h_{35}^{\cdot}78$ | $h_{36}^{\cdot}64$ | $l_{36}^{\cdot}84$ | $h_{40}^{\cdot}06$ | $h_{36}^{\cdot}88$ | $h_{38}^{\cdot}14$ | $h_{37}^{\cdot}10$                                                                                |                                                                                                    |
|                                                                                                    | 37° 77'                                     | 36° 99'            | 37° 19'            | 36° 15'            | 37° 13'            | 37° 71'            | 39° 42'            | 36° 62'            | 38° 35'            | 37° 23'                                                                                           |                                                                                                    |
| LI &<br>LIV                                                                                        | $h_{53}^{\cdot}16$                          | $h_{53}^{\cdot}74$ | $h_{50}^{\cdot}54$ | $h_{53}^{\cdot}34$ | $l_{53}^{\cdot}16$ | $h_{52}^{\cdot}56$ | $h_{53}^{\cdot}72$ | $h_{50}^{\cdot}32$ | $h_{49}^{\cdot}96$ | $M = 52''\cdot20$<br>$w = 5\cdot34$<br>$\frac{1}{w} = 0\cdot19$<br>$C = 52^\circ 32' 52''\cdot20$ |                                                                                                    |
|                                                                                                    | $l_{50}^{\cdot}30$                          | $l_{53}^{\cdot}16$ | $h_{53}^{\cdot}60$ | $h_{50}^{\cdot}42$ | $h_{53}^{\cdot}66$ | $l_{50}^{\cdot}98$ | $h_{51}^{\cdot}54$ | $h_{51}^{\cdot}94$ | $h_{50}^{\cdot}76$ |                                                                                                   | $h_{52}^{\cdot}32$                                                                                 |
|                                                                                                    | $l_{51}^{\cdot}54$                          |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                   |                                                                                                    |
|                                                                                                    | 52° 05'                                     | 53° 66'            | 53° 67'            | 50° 48'            | 53° 50'            | 52° 07'            | 52° 05'            | 52° 83'            | 50° 54'            | 51° 14'                                                                                           |                                                                                                    |
| LIV &<br>LVI                                                                                       | $l_{10}^{\cdot}16$                          | $l_{10}^{\cdot}90$ | $l_{11}^{\cdot}68$ | $l_{11}^{\cdot}52$ | $l_{10}^{\cdot}44$ | $l_{10}^{\cdot}58$ | $h_{13}^{\cdot}08$ | $h_{10}^{\cdot}38$ | $h_{16}^{\cdot}14$ | $h_{12}^{\cdot}18$                                                                                | $M = 11''\cdot64$<br>$w = 4\cdot40$<br>$\frac{1}{w} = 0\cdot23$<br>$C = 72^\circ 2' 11''\cdot64$   |
|                                                                                                    | $l_{10}^{\cdot}72$                          | $l_{10}^{\cdot}82$ | $l_{10}^{\cdot}86$ | $l_{9}^{\cdot}82$  | $l_{12}^{\cdot}10$ | $l_{12}^{\cdot}76$ | $h_{11}^{\cdot}62$ | $h_{11}^{\cdot}22$ | $h_{14}^{\cdot}62$ | $h_{11}^{\cdot}16$                                                                                |                                                                                                    |
|                                                                                                    | 10° 44'                                     | 10° 86'            | 11° 27'            | 10° 67'            | 11° 27'            | 11° 67'            | 12° 35'            | 10° 80'            | 15° 38'            | 11° 67'                                                                                           |                                                                                                    |
| LVI &<br>LVII                                                                                      | $l_{32}^{\cdot}08$                          | $l_{31}^{\cdot}04$ | $l_{30}^{\cdot}48$ | $l_{30}^{\cdot}74$ | $l_{29}^{\cdot}36$ | $l_{28}^{\cdot}90$ | $h_{28}^{\cdot}36$ | $h_{31}^{\cdot}84$ | $h_{24}^{\cdot}78$ | $h_{30}^{\cdot}46$                                                                                | $M = 30''\cdot20$<br>$w = 3\cdot51$<br>$\frac{1}{w} = 0\cdot28$<br>$C = 60^\circ 49' 30''\cdot19$  |
|                                                                                                    | $l_{31}^{\cdot}08$                          | $l_{31}^{\cdot}02$ | $l_{31}^{\cdot}84$ | $l_{32}^{\cdot}78$ | $l_{29}^{\cdot}46$ | $l_{30}^{\cdot}68$ | $h_{28}^{\cdot}68$ | $h_{30}^{\cdot}90$ | $h_{28}^{\cdot}10$ | $h_{30}^{\cdot}82$                                                                                |                                                                                                    |
|                                                                                                    |                                             |                    |                    |                    |                    |                    |                    | $h_{27}^{\cdot}36$ |                    |                                                                                                   |                                                                                                    |
|                                                                                                    | 31° 58'                                     | 31° 03'            | 31° 16'            | 31° 76'            | 29° 41'            | 29° 79'            | 28° 52'            | 31° 37'            | 26° 75'            | 30° 64'                                                                                           |                                                                                                    |

| At LIII—(Continued.)                                                                               |                                             |          |          |          |          |          |          |          |          |          |                                                                        |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|------------------------------------------------------------------------|
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |          |          |          |          |          |          |          |          |          |                                                                        |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LII |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle       |
|                                                                                                    | 0° 1'                                       | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                        |
| LVII &<br>LV                                                                                       | "                                           | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 32''·29<br>w = 6·24<br>$\frac{1}{w}$ = 0·16<br>C = 51° 53' 32''·31 |
|                                                                                                    | l 33'·26                                    | l 32'·24 | h 31'·18 | h 32'·42 | h 31'·74 | l 34'·94 | h 32'·34 | h 32'·46 | h 31'·08 | h 32'·10 |                                                                        |
|                                                                                                    | l 34'·30                                    | l 36'·20 | h 32'·72 | h 32'·26 | h 32'·22 | l 31'·84 | h 32'·08 | h 32'·52 | h 28'·76 | h 31'·60 |                                                                        |
|                                                                                                    |                                             | l 31'·52 |          |          |          | l 32'·38 |          |          |          |          |                                                                        |
|                                                                                                    | 33'·78                                      | 33'·32   | 31'·95   | 32'·34   | 31'·98   | 33'·05   | 32'·21   | 32'·49   | 29'·92   | 31'·85   |                                                                        |
| LV &<br>LII                                                                                        | l 14'·68                                    | l 16'·76 | h 15'·98 | h 16'·46 | h 15'·80 | l 12'·78 | h 13'·98 | h 16'·22 | h 16'·52 | h 16'·28 | M = 16''·08<br>w = 7·94<br>$\frac{1}{w}$ = 0·13<br>C = 63° 27' 16''·07 |
|                                                                                                    | l 15'·96                                    | l 13'·54 | h 16'·64 | h 17'·76 | h 16'·66 | l 15'·38 | h 15'·34 | h 17'·18 | h 17'·38 | h 17'·34 |                                                                        |
|                                                                                                    |                                             | l 18'·70 |          |          |          | l 14'·90 |          |          |          |          |                                                                        |
|                                                                                                    | 15'·32                                      | 16'·33   | 16'·31   | 17'·11   | 16'·23   | 14'·35   | 14'·66   | 16'·70   | 16'·95   | 16'·81   |                                                                        |
| At LIV                                                                                             |                                             |          |          |          |          |          |          |          |          |          |                                                                        |
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |          |          |          |          |          |          |          |          |          |                                                                        |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LVI |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle       |
|                                                                                                    | 230° 11'                                    | 50° 11'  | 237° 22' | 57° 22'  | 244° 34' | 64° 34'  | 251° 46' | 71° 46'  | 258° 58' | 78° 58'  |                                                                        |
| LVI &<br>LIII                                                                                      | "                                           | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 6''·12<br>w = 4·68<br>$\frac{1}{w}$ = 0·21<br>C = 64° 55' 6''·17   |
|                                                                                                    | h 6'·16                                     | h 6'·38  | l 5'·46  | l 7'·46  | h 3'·22  | h 5'·08  | h 5'·70  | l 7'·26  | l 6'·18  | l 4'·34  |                                                                        |
|                                                                                                    | h 5'·10                                     | h 5'·54  | l 8'·48  | l 11'·50 | h 5'·00  | h 6'·58  | h 6'·56  | l 4'·72  | l 5'·10  | l 6'·70  |                                                                        |
|                                                                                                    |                                             |          | l 9'·52  | l 6'·12  |          |          |          | l 6'·50  |          |          |                                                                        |
|                                                                                                    | 5'·63                                       | 5'·96    | 7'·82    | 8'·36    | 4'·11    | 5'·83    | 6'·13    | 6'·16    | 5'·64    | 5'·52    |                                                                        |
| LIII &<br>LI                                                                                       | h 10'·72                                    | h 12'·02 | l 8'·96  | l 10'·94 | h 12'·90 | h 11'·82 | h 10'·56 | l 12'·30 | l 9'·72  | l 12'·60 | M = 11''·12<br>w = 7·34<br>$\frac{1}{w}$ = 0·14<br>C = 64° 55' 11''·13 |
|                                                                                                    | h 11'·78                                    | h 11'·38 | l 10'·16 | l 9'·76  | h 11'·28 | h 11'·26 | h 9'·88  | l 14'·10 | l 9'·90  | l 11'·10 |                                                                        |
|                                                                                                    |                                             |          |          |          |          |          | l 12'·20 |          |          |          |                                                                        |
|                                                                                                    | 11'·25                                      | 11'·70   | 9'·56    | 10'·35   | 12'·09   | 11'·54   | 10'·22   | 12'·87   | 9'·81    | 11'·85   |                                                                        |

## KARACHI LONGITUDINAL SERIES.

| At LV                                                                                              |                                             |                |                |                |                |                |                |                |                |                |                                                                                              |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------------------------------------------------------------------------------|
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                |                |                                                                                              |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LII |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                       | 180° 1'        | 7° 12'         | 187° 12'       | 14° 25'        | 194° 25'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                              |
| LII &<br>LIII                                                                                      | "                                           | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 25''·99<br><i>w</i> = 2·40<br>$\frac{1}{w}$ = 0·42<br><i>C</i> = 62° 18' 25''·99  |
|                                                                                                    | <i>h</i> 24°34                              | <i>h</i> 24°06 | <i>h</i> 23°84 | <i>h</i> 25°06 | <i>h</i> 28°30 | <i>h</i> 27°68 | <i>h</i> 26°84 | <i>l</i> 22°70 | <i>l</i> 26°20 | <i>l</i> 29°12 |                                                                                              |
|                                                                                                    | <i>h</i> 25°36                              | <i>h</i> 23°88 | <i>h</i> 22°88 | <i>h</i> 25°34 | <i>h</i> 26°32 | <i>h</i> 28°34 | <i>h</i> 26°54 | <i>l</i> 24°02 | <i>l</i> 28°06 | <i>l</i> 29°14 |                                                                                              |
|                                                                                                    | 24°85                                       | 24°42          | 23°36          | 25°65          | 27°31          | 28°01          | 26°69          | 23°36          | 27°13          | 29°13          |                                                                                              |
| LIII &<br>LVII                                                                                     | <i>h</i> 43°48                              | <i>h</i> 43°60 | <i>h</i> 43°58 | <i>h</i> 41°06 | <i>h</i> 42°80 | <i>h</i> 44°08 | <i>h</i> 43°76 | <i>l</i> 46°38 | <i>l</i> 45°30 | <i>l</i> 43°82 | <i>M</i> = 43''·81<br><i>w</i> = 7·47<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 70° 39' 43''·80  |
|                                                                                                    | <i>h</i> 45°52                              | <i>h</i> 42°64 | <i>h</i> 44°64 | <i>h</i> 42°34 | <i>h</i> 44°82 | <i>h</i> 41°48 | <i>h</i> 44°50 | <i>l</i> 44°34 | <i>l</i> 43°94 | <i>l</i> 43°48 |                                                                                              |
|                                                                                                    |                                             |                |                |                | <i>h</i> 43°86 |                |                |                |                |                |                                                                                              |
|                                                                                                    | 44°50                                       | 43°12          | 44°11          | 41°70          | 43°81          | 43°14          | 44°13          | 45°36          | 44°62          | 43°65          |                                                                                              |
| At LVI                                                                                             |                                             |                |                |                |                |                |                |                |                |                |                                                                                              |
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                |                |                                                                                              |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LIX |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                       | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                              |
| LIX &<br>LVIII                                                                                     | "                                           | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 50''·51<br><i>w</i> = 12·82<br>$\frac{1}{w}$ = 0·08<br><i>C</i> = 56° 22' 50''·51 |
|                                                                                                    | <i>l</i> 52°74                              | <i>l</i> 49°72 | <i>l</i> 49°28 | <i>l</i> 51°26 | <i>h</i> 50°40 | <i>h</i> 52°42 | <i>l</i> 50°50 | <i>l</i> 51°12 | <i>l</i> 51°30 | <i>l</i> 51°86 |                                                                                              |
|                                                                                                    | <i>l</i> 50°94                              | <i>l</i> 50°26 | <i>l</i> 49°70 | <i>l</i> 50°66 | <i>h</i> 49°86 | <i>h</i> 50°08 | <i>l</i> 48°70 | <i>l</i> 50°02 | <i>l</i> 50°96 | <i>l</i> 49°50 |                                                                                              |
|                                                                                                    |                                             |                |                |                | <i>h</i> 50°50 |                |                |                |                | <i>l</i> 49°88 |                                                                                              |
|                                                                                                    | 51°84                                       | 49°99          | 49°49          | 50°96          | 50°13          | 51°00          | 49°60          | 50°57          | 51°13          | 50°41          |                                                                                              |
| LVIII &<br>LVII                                                                                    | <i>l</i> 35°00                              | <i>l</i> 33°22 | <i>l</i> 35°56 | <i>l</i> 35°54 | <i>h</i> 34°38 | <i>h</i> 32°76 | <i>h</i> 34°56 | <i>h</i> 34°54 | <i>h</i> 34°54 | <i>h</i> 35°70 | <i>M</i> = 34''·48<br><i>w</i> = 10·12<br>$\frac{1}{w}$ = 0·10<br><i>C</i> = 42° 55' 34''·49 |
|                                                                                                    | <i>l</i> 35°04                              | <i>l</i> 33°06 | <i>l</i> 37°88 | <i>l</i> 32°74 | <i>h</i> 34°46 | <i>h</i> 33°76 | <i>h</i> 34°08 | <i>h</i> 33°92 | <i>h</i> 35°24 | <i>h</i> 34°70 |                                                                                              |
|                                                                                                    |                                             |                | <i>l</i> 34°26 | <i>l</i> 34°88 |                |                |                |                |                |                |                                                                                              |
|                                                                                                    | 35°02                                       | 33°14          | 35°90          | 34°39          | 34°42          | 33°26          | 34°32          | 34°23          | 34°89          | 35°20          |                                                                                              |



| At LVI—(Continued.)                                                                                |                                             |                |                |                |                |                |                |                |                |                |                                                                                                   |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------------------------------------------------------------------------------------|
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                |                |                                                                                                   |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LIX |                |                |                |                |                |                |                |                |                | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                            |
|                                                                                                    | 0° 1'                                       | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                                   |
| LVII &<br>LVIII                                                                                    | "                                           | "              | "              | "              | "              | "              | "              | "              | "              | "              | $M = 57''\cdot65$<br>$w = 1\cdot62$<br>$\frac{1}{w} = 0\cdot62$<br>$C = 52^\circ 55' 57''\cdot66$ |
|                                                                                                    | $l\ 52\cdot24$                              | $l\ 58\cdot00$ | $l\ 57\cdot96$ | $l\ 59\cdot38$ | $l\ 59\cdot70$ | $l\ 59\cdot46$ | $h\ 58\cdot42$ | $h\ 60\cdot04$ | $h\ 58\cdot26$ | $h\ 53\cdot42$ |                                                                                                   |
|                                                                                                    | $l\ 54\cdot00$                              | $l\ 56\cdot70$ | $l\ 54\cdot36$ | $l\ 61\cdot04$ | $l\ 56\cdot76$ | $l\ 58\cdot86$ | $h\ 59\cdot76$ | $h\ 58\cdot92$ | $h\ 57\cdot24$ | $h\ 55\cdot28$ |                                                                                                   |
|                                                                                                    |                                             |                | $l\ 57\cdot14$ |                | $l\ 62\cdot00$ |                |                |                |                |                |                                                                                                   |
|                                                                                                    | $53\cdot12$                                 | $57\cdot35$    | $56\cdot49$    | $60\cdot21$    | $59\cdot49$    | $59\cdot16$    | $59\cdot09$    | $59\cdot48$    | $57\cdot75$    | $54\cdot35$    |                                                                                                   |
| LVIII &<br>LVIV                                                                                    | $l\ 44\cdot48$                              | $l\ 43\cdot66$ | $l\ 41\cdot66$ | $l\ 42\cdot38$ | $l\ 43\cdot66$ | $l\ 43\cdot52$ | $l\ 42\cdot48$ | $l\ 41\cdot02$ | $l\ 42\cdot54$ | $l\ 42\cdot50$ | $M = 42''\cdot77$<br>$w = 6\cdot45$<br>$\frac{1}{w} = 0\cdot16$<br>$C = 43^\circ 2' 42''\cdot75$  |
|                                                                                                    | $l\ 43\cdot14$                              | $l\ 42\cdot84$ | $l\ 43\cdot28$ | $l\ 43\cdot38$ | $l\ 45\cdot08$ | $l\ 42\cdot12$ | $l\ 43\cdot18$ | $l\ 38\cdot06$ | $l\ 43\cdot24$ | $l\ 42\cdot00$ |                                                                                                   |
|                                                                                                    |                                             |                |                |                |                |                |                | $l\ 41\cdot32$ |                |                |                                                                                                   |
|                                                                                                    | $43\cdot81$                                 | $43\cdot25$    | $42\cdot47$    | $42\cdot88$    | $44\cdot37$    | $42\cdot82$    | $42\cdot83$    | $40\cdot13$    | $42\cdot89$    | $42\cdot25$    |                                                                                                   |
| At LVII                                                                                            |                                             |                |                |                |                |                |                |                |                |                |                                                                                                   |
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |                |                |                |                |                |                |                |                |                |                                                                                                   |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LV  |                |                |                |                |                |                |                |                |                | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                            |
|                                                                                                    | 31° 8'                                      | 211° 8'        | 38° 19'        | 218° 19'       | 45° 31'        | 225° 31'       | 52° 43'        | 232° 43'       | 59° 55'        | 239° 55'       |                                                                                                   |
| LV &<br>LVIII                                                                                      | "                                           | "              | "              | "              | "              | "              | "              | "              | "              | "              | $M = 44''\cdot17$<br>$w = 7\cdot12$<br>$\frac{1}{w} = 0\cdot14$<br>$C = 57^\circ 26' 44''\cdot17$ |
|                                                                                                    | $h\ 45\cdot24$                              | $l\ 42\cdot48$ | $h\ 44\cdot52$ | $h\ 43\cdot18$ | $h\ 43\cdot50$ | $h\ 44\cdot98$ | $h\ 47\cdot10$ | $h\ 45\cdot84$ | $h\ 44\cdot66$ | $h\ 44\cdot28$ |                                                                                                   |
|                                                                                                    | $h\ 44\cdot46$                              | $l\ 43\cdot10$ | $h\ 43\cdot28$ | $h\ 43\cdot32$ | $h\ 44\cdot80$ | $h\ 40\cdot98$ | $h\ 44\cdot66$ | $h\ 44\cdot86$ | $h\ 44\cdot44$ | $h\ 44\cdot10$ |                                                                                                   |
|                                                                                                    |                                             |                |                |                |                | $h\ 42\cdot24$ | $h\ 45\cdot96$ |                |                |                |                                                                                                   |
|                                                                                                    | $44\cdot85$                                 | $42\cdot79$    | $43\cdot90$    | $43\cdot25$    | $44\cdot15$    | $42\cdot73$    | $45\cdot91$    | $45\cdot35$    | $44\cdot55$    | $44\cdot19$    |                                                                                                   |
| LVIII &<br>LVVI                                                                                    | $h\ 33\cdot92$                              | $l\ 33\cdot74$ | $h\ 33\cdot64$ | $h\ 34\cdot62$ | $h\ 35\cdot80$ | $h\ 34\cdot56$ | $h\ 32\cdot82$ | $h\ 34\cdot10$ | $h\ 34\cdot38$ | $h\ 32\cdot56$ | $M = 34''\cdot04$<br>$w = 9\cdot00$<br>$\frac{1}{w} = 0\cdot11$<br>$C = 66^\circ 14' 34''\cdot03$ |
|                                                                                                    | $l\ 35\cdot38$                              | $l\ 34\cdot32$ | $h\ 35\cdot50$ | $h\ 35\cdot32$ | $h\ 33\cdot34$ | $h\ 35\cdot72$ | $h\ 33\cdot80$ | $h\ 31\cdot08$ | $h\ 32\cdot74$ | $h\ 33\cdot02$ |                                                                                                   |
|                                                                                                    |                                             |                |                |                | $h\ 34\cdot92$ |                |                | $h\ 32\cdot88$ |                |                |                                                                                                   |
|                                                                                                    | $34\cdot65$                                 | $34\cdot03$    | $34\cdot57$    | $34\cdot97$    | $34\cdot69$    | $35\cdot14$    | $33\cdot31$    | $32\cdot69$    | $33\cdot56$    | $32\cdot79$    |                                                                                                   |
| LVVI &<br>LVIII                                                                                    | $h\ 35\cdot38$                              | $l\ 37\cdot78$ | $h\ 37\cdot90$ | $h\ 34\cdot94$ | $h\ 38\cdot38$ | $h\ 34\cdot92$ | $h\ 37\cdot86$ | $h\ 33\cdot54$ | $h\ 35\cdot86$ | $h\ 34\cdot70$ | $M = 36''\cdot31$<br>$w = 5\cdot26$<br>$\frac{1}{w} = 0\cdot19$<br>$C = 60^\circ 25' 36''\cdot31$ |
|                                                                                                    | $l\ 36\cdot76$                              | $l\ 35\cdot94$ | $h\ 35\cdot18$ | $h\ 35\cdot16$ | $h\ 38\cdot86$ | $h\ 36\cdot42$ | $h\ 37\cdot72$ | $h\ 36\cdot80$ | $h\ 37\cdot94$ | $h\ 34\cdot48$ |                                                                                                   |
|                                                                                                    |                                             |                |                |                |                |                |                | $h\ 35\cdot52$ | $h\ 36\cdot08$ |                |                                                                                                   |
|                                                                                                    | $36\cdot07$                                 | $36\cdot86$    | $36\cdot54$    | $35\cdot05$    | $38\cdot62$    | $35\cdot67$    | $37\cdot79$    | $35\cdot29$    | $36\cdot63$    | $34\cdot59$    |                                                                                                   |

KARACHI LONGITUDINAL SERIES.

| At LV                                                                                              |                                             |         |        |          |         |          |         |          |         |          |                                                                                              |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|---------|--------|----------|---------|----------|---------|----------|---------|----------|----------------------------------------------------------------------------------------------|
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |         |        |          |         |          |         |          |         |          |                                                                                              |
| Angle between                                                                                      | Circle readings, telescope being set on LII |         |        |          |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                       | 180° 1' | 7° 12' | 187° 12' | 14° 25' | 194° 25' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                                              |
| LII & LIII                                                                                         | "                                           | "       | "      | "        | "       | "        | "       | "        | "       | "        | <i>M</i> = 25''·99<br><i>w</i> = 2·40<br>$\frac{1}{w}$ = 0·42<br><i>C</i> = 62° 18' 25''·99  |
|                                                                                                    | h24°34                                      | h24°06  | h23°84 | h25°06   | h28°30  | h27°68   | h26°84  | l22°70   | l26°20  | l29°12   |                                                                                              |
|                                                                                                    | h25°36                                      | h23°88  | h22°88 | h25°34   | h26°32  | h28°34   | h26°54  | l24°02   | l28°06  | l29°14   |                                                                                              |
|                                                                                                    | 24°85                                       | 24°42   | 23°36  | 25°65    | 27°31   | 28°01    | 26°69   | 23°36    | 27°13   | 29°13    |                                                                                              |
| LIII & LVII                                                                                        | h43°48                                      | h43°60  | h43°58 | h41°06   | h42°80  | h44°08   | h43°76  | l46°38   | l45°30  | l43°82   | <i>M</i> = 43''·81<br><i>w</i> = 7·47<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 70° 39' 43''·80  |
|                                                                                                    | h45°52                                      | h42°64  | h44°64 | h42°34   | h44°82  | h41°48   | h44°50  | l44°34   | l43°94  | l43°48   |                                                                                              |
|                                                                                                    |                                             |         |        |          |         | h43°86   |         |          |         |          |                                                                                              |
|                                                                                                    | 44°50                                       | 43°12   | 44°11  | 41°70    | 43°81   | 43°14    | 44°13   | 45°36    | 44°62   | 43°65    |                                                                                              |
| At LVI                                                                                             |                                             |         |        |          |         |          |         |          |         |          |                                                                                              |
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |         |        |          |         |          |         |          |         |          |                                                                                              |
| Angle between                                                                                      | Circle readings, telescope being set on LIX |         |        |          |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                       | 180° 1' | 7° 12' | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                                              |
| LIX & LVIII                                                                                        | "                                           | "       | "      | "        | "       | "        | "       | "        | "       | "        | <i>M</i> = 50''·51<br><i>w</i> = 12·82<br>$\frac{1}{w}$ = 0·08<br><i>C</i> = 56° 22' 50''·51 |
|                                                                                                    | l52°74                                      | l49°72  | l49°28 | l51°26   | h50°40  | h52°42   | l50°50  | l51°12   | l51°30  | l51°86   |                                                                                              |
|                                                                                                    | l50°94                                      | l50°26  | l49°70 | l50°66   | h49°86  | h50°08   | l48°70  | l50°02   | l50°96  | l49°50   |                                                                                              |
|                                                                                                    |                                             |         |        |          |         | h50°50   |         |          |         | l49°88   |                                                                                              |
|                                                                                                    | 51°84                                       | 49°99   | 49°49  | 50°96    | 50°13   | 51°00    | 49°60   | 50°57    | 51°13   | 50°41    |                                                                                              |
| LVIII & LVII                                                                                       | l35°00                                      | l33°22  | l35°56 | l35°54   | h34°38  | h32°76   | h34°56  | h34°54   | h34°54  | h35°70   | <i>M</i> = 34''·48<br><i>w</i> = 10·12<br>$\frac{1}{w}$ = 0·10<br><i>C</i> = 42° 55' 34''·49 |
|                                                                                                    | l35°04                                      | l33°06  | l37°88 | l32°74   | h34°46  | h33°76   | h34°08  | h33°92   | h35°24  | h34°70   |                                                                                              |
|                                                                                                    |                                             |         | l34°26 | l34°88   |         |          |         |          |         |          |                                                                                              |
|                                                                                                    | 35°02                                       | 33°14   | 35°90  | 34°39    | 34°42   | 33°26    | 34°32   | 34°23    | 34°89   | 35°20    |                                                                                              |

| At LVI—(Continued.)                                                                                |                                             |          |          |          |          |          |          |          |          |          |                                                                                             |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------------------------------------------------------------------------------------|
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |          |          |          |          |          |          |          |          |          |                                                                                             |
| Angle between                                                                                      | Circle readings, telescope being set on LIX |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|                                                                                                    | 0° 1'                                       | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                                             |
| LVII & LVIII                                                                                       | "                                           | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 57''·65<br><i>w</i> = 1·62<br>$\frac{1}{w}$ = 0·62<br><i>C</i> = 52° 55' 57''·66 |
|                                                                                                    | l 52'·24                                    | l 58'·00 | l 57'·96 | l 59'·38 | l 59'·70 | l 59'·46 | h 58'·42 | h 60'·04 | h 58'·26 | h 53'·42 |                                                                                             |
|                                                                                                    | l 54'·00                                    | l 56'·70 | l 54'·36 | l 61'·04 | l 56'·76 | l 58'·86 | h 59'·76 | h 58'·92 | h 57'·24 | h 55'·28 |                                                                                             |
|                                                                                                    |                                             |          | l 57'·14 |          | l 62'·00 |          |          |          |          |          |                                                                                             |
|                                                                                                    | 53'·12                                      | 57'·35   | 56'·49   | 60'·21   | 59'·49   | 59'·16   | 59'·09   | 59'·48   | 57'·75   | 54'·35   |                                                                                             |
| LVIII & LIV                                                                                        | l 44'·48                                    | l 43'·66 | l 41'·66 | l 42'·38 | l 43'·66 | l 43'·52 | l 42'·48 | l 41'·02 | l 42'·54 | l 42'·50 | <i>M</i> = 42''·77<br><i>w</i> = 6·45<br>$\frac{1}{w}$ = 0·16<br><i>C</i> = 43° 2' 42''·75  |
|                                                                                                    | l 43'·14                                    | l 42'·84 | l 43'·28 | l 43'·38 | l 45'·08 | l 42'·12 | l 43'·18 | l 38'·06 | l 43'·24 | l 42'·00 |                                                                                             |
|                                                                                                    |                                             |          |          |          |          |          | l 41'·32 |          |          |          |                                                                                             |
|                                                                                                    | 43'·81                                      | 43'·25   | 42'·47   | 42'·88   | 44'·37   | 42'·82   | 42'·83   | 40'·13   | 42'·89   | 42'·25   |                                                                                             |
| At LVII                                                                                            |                                             |          |          |          |          |          |          |          |          |          |                                                                                             |
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |          |          |          |          |          |          |          |          |          |                                                                                             |
| Angle between                                                                                      | Circle readings, telescope being set on LV  |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|                                                                                                    | 31° 8'                                      | 211° 8'  | 38° 19'  | 218° 19' | 45° 31'  | 225° 31' | 52° 43'  | 232° 43' | 59° 55'  | 239° 55' |                                                                                             |
| LV & LVIII                                                                                         | "                                           | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 44''·17<br><i>w</i> = 7·12<br>$\frac{1}{w}$ = 0·14<br><i>C</i> = 57° 26' 44''·17 |
|                                                                                                    | h 45'·24                                    | l 42'·48 | h 44'·52 | h 43'·18 | h 43'·50 | h 44'·98 | h 47'·10 | h 45'·84 | h 44'·66 | h 44'·28 |                                                                                             |
|                                                                                                    | h 44'·46                                    | l 43'·10 | h 43'·28 | h 43'·32 | h 44'·80 | h 40'·98 | h 44'·66 | h 44'·86 | h 44'·44 | h 44'·10 |                                                                                             |
|                                                                                                    |                                             |          |          |          |          | h 42'·24 | h 45'·96 |          |          |          |                                                                                             |
|                                                                                                    | 44'·85                                      | 42'·79   | 43'·90   | 43'·25   | 44'·15   | 42'·73   | 45'·91   | 45'·35   | 44'·55   | 44'·19   |                                                                                             |
| LVIII & LVI                                                                                        | h 33'·92                                    | l 33'·74 | h 33'·64 | h 34'·62 | h 35'·80 | h 34'·56 | h 32'·82 | h 34'·10 | h 34'·38 | h 32'·56 | <i>M</i> = 34''·04<br><i>w</i> = 9·00<br>$\frac{1}{w}$ = 0·11<br><i>C</i> = 66° 14' 34''·03 |
|                                                                                                    | l 35'·38                                    | l 34'·32 | h 35'·50 | h 35'·32 | h 33'·34 | h 35'·72 | h 33'·80 | h 31'·08 | h 32'·74 | h 33'·02 |                                                                                             |
|                                                                                                    |                                             |          |          | h 34'·92 |          |          | h 32'·88 |          |          |          |                                                                                             |
|                                                                                                    | 34'·65                                      | 34'·03   | 34'·57   | 34'·97   | 34'·69   | 35'·14   | 33'·31   | 32'·69   | 33'·56   | 32'·79   |                                                                                             |
| LVI & LVIII                                                                                        | h 35'·38                                    | l 37'·78 | h 37'·90 | h 34'·94 | h 38'·38 | h 34'·92 | h 37'·86 | h 33'·54 | h 35'·86 | h 34'·70 | <i>M</i> = 36''·31<br><i>w</i> = 5·26<br>$\frac{1}{w}$ = 0·19<br><i>C</i> = 60° 25' 36''·31 |
|                                                                                                    | l 36'·76                                    | l 35'·94 | h 35'·18 | h 35'·16 | h 38'·86 | h 36'·42 | h 37'·72 | h 36'·80 | h 37'·94 | h 34'·48 |                                                                                             |
|                                                                                                    |                                             |          |          |          |          |          | h 35'·52 | h 36'·08 |          |          |                                                                                             |
|                                                                                                    | 36'·07                                      | 36'·86   | 36'·54   | 35'·05   | 38'·62   | 35'·67   | 37'·79   | 35'·29   | 36'·63   | 34'·59   |                                                                                             |

| At LVII—(Continued.)                                                                                            |                                              |                |                |                |                |                |                |                |                |                |                                                                                            |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------------------------------------------------------------------------------|
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>              |                                              |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle between                                                                                                   | Circle readings, telescope being set on LV   |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                 | 31° 8'                                       | 211° 8'        | 38° 19'        | 218° 19'       | 45° 31'        | 225° 31'       | 52° 48'        | 232° 48'       | 59° 55'        | 239° 55'       |                                                                                            |
| LVIII & LX                                                                                                      | "                                            | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 25''86<br><i>w</i> = 3.21<br>$\frac{1}{w}$ = 0.31<br><i>C</i> = 64° 23' 25''86  |
|                                                                                                                 | <i>h</i> 27°08                               | <i>l</i> 27°24 | <i>h</i> 23°64 | <i>h</i> 26°26 | <i>h</i> 22°62 | <i>h</i> 25°16 | <i>h</i> 23°56 | <i>h</i> 26°50 | <i>h</i> 26°64 | <i>h</i> 28°26 |                                                                                            |
|                                                                                                                 | <i>h</i> 28°04                               | <i>l</i> 26°82 | <i>h</i> 25°08 | <i>h</i> 25°86 | <i>h</i> 23°74 | <i>h</i> 24°80 | <i>h</i> 24°56 | <i>h</i> 26°82 | <i>h</i> 24°62 | <i>h</i> 29°16 |                                                                                            |
|                                                                                                                 | 27°56                                        | 27°03          | 24°36          | 26°06          | 23°18          | 24°98          | 24°06          | 26°66          | 25°95          | 28°71          |                                                                                            |
| At LVIII                                                                                                        |                                              |                |                |                |                |                |                |                |                |                |                                                                                            |
| <i>November and December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                |                |                |                |                |                |                |                |                |                                                                                            |
| Angle between                                                                                                   | Circle readings, telescope being set on LVII |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                 | 0° 1'                                        | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                            |
| LVII & LVI                                                                                                      | "                                            | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 51''97<br><i>w</i> = 10.26<br>$\frac{1}{w}$ = 0.10<br><i>C</i> = 76° 38' 51''97 |
|                                                                                                                 | <i>h</i> 50°88                               | <i>h</i> 50°44 | <i>l</i> 52°16 | <i>l</i> 53°72 | <i>l</i> 51°08 | <i>l</i> 51°04 | <i>h</i> 52°10 | <i>h</i> 51°28 | <i>h</i> 52°24 | <i>l</i> 52°88 |                                                                                            |
|                                                                                                                 | <i>h</i> 51°38                               | <i>h</i> 52°26 | <i>l</i> 51°18 | <i>l</i> 52°64 | <i>l</i> 51°64 | <i>l</i> 53°20 | <i>h</i> 54°38 | <i>h</i> 52°98 | <i>h</i> 53°30 | <i>l</i> 48°90 |                                                                                            |
|                                                                                                                 | 51°13                                        | 51°35          | 51°67          | 53°18          | 51°36          | 51°69          | 52°73          | 52°13          | 52°77          | 51°65          |                                                                                            |
| LVI & LIX                                                                                                       | <i>h</i> 61°42                               | <i>h</i> 62°00 | <i>l</i> 63°72 | <i>l</i> 59°84 | <i>l</i> 64°82 | <i>l</i> 64°72 | <i>h</i> 61°74 | <i>h</i> 61°74 | <i>h</i> 63°42 | <i>l</i> 61°56 | <i>M</i> = 2''12<br><i>w</i> = 7.14<br>$\frac{1}{w}$ = 0.14<br><i>C</i> = 48° 13' 2''12    |
|                                                                                                                 | <i>h</i> 61°68                               | <i>h</i> 61°08 | <i>l</i> 63°54 | <i>l</i> 61°82 | <i>l</i> 63°46 | <i>l</i> 61°84 | <i>h</i> 61°20 | <i>h</i> 61°82 | <i>h</i> 61°12 | <i>l</i> 62°48 |                                                                                            |
|                                                                                                                 |                                              |                |                |                |                | <i>l</i> 60°68 |                |                | <i>h</i> 61°06 |                |                                                                                            |
|                                                                                                                 | 61°55                                        | 61°54          | 63°63          | 60°83          | 64°14          | 62°41          | 61°47          | 61°78          | 61°87          | 62°02          |                                                                                            |
| LIX & LXI                                                                                                       | <i>h</i> 30°90                               | <i>h</i> 30°72 | <i>l</i> 31°16 | <i>l</i> 31°66 | <i>l</i> 30°00 | <i>l</i> 30°72 | <i>h</i> 31°14 | <i>h</i> 31°36 | <i>h</i> 30°92 | <i>l</i> 31°82 | <i>M</i> = 30''37<br><i>w</i> = 5.41<br>$\frac{1}{w}$ = 0.18<br><i>C</i> = 56° 55' 30''31  |
|                                                                                                                 | <i>h</i> 27°34                               | <i>h</i> 30°28 | <i>l</i> 27°12 | <i>l</i> 30°42 | <i>l</i> 26°46 | <i>l</i> 30°98 | <i>h</i> 30°94 | <i>h</i> 30°72 | <i>h</i> 30°32 | <i>l</i> 32°08 |                                                                                            |
|                                                                                                                 | <i>h</i> 29°40                               |                | <i>l</i> 26°86 |                | <i>l</i> 30°84 |                |                |                |                |                |                                                                                            |
|                                                                                                                 | 29°21                                        | 30°50          | 28°38          | 31°04          | 29°10          | 30°85          | 31°04          | 31°04          | 30°62          | 31°95          |                                                                                            |
| LXI & LXII                                                                                                      | <i>h</i> 24°88                               | <i>h</i> 24°88 | <i>l</i> 24°10 | <i>l</i> 24°66 | <i>l</i> 23°82 | <i>l</i> 22°78 | <i>h</i> 25°08 | <i>h</i> 24°46 | <i>h</i> 23°28 | <i>l</i> 24°28 | <i>M</i> = 24''21<br><i>w</i> = 6.74<br>$\frac{1}{w}$ = 0.15<br><i>C</i> = 69° 58' 24''22  |
|                                                                                                                 | <i>h</i> 28°58                               | <i>h</i> 25°10 | <i>l</i> 24°84 | <i>l</i> 22°54 | <i>l</i> 22°78 | <i>l</i> 23°42 | <i>h</i> 23°44 | <i>h</i> 24°64 | <i>h</i> 22°64 | <i>l</i> 24°12 |                                                                                            |
|                                                                                                                 | <i>h</i> 26°56                               |                |                |                |                |                |                |                |                |                |                                                                                            |
|                                                                                                                 | 26°67                                        | 24°99          | 24°47          | 23°60          | 23°30          | 23°10          | 24°26          | 24°55          | 22°96          | 24°20          |                                                                                            |

| At LVIII—(Continued.)                                                                                           |                                              |         |         |          |         |          |         |          |         |          |                                                                     |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|----------|---------------------------------------------------------------------|
| <i>November and December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |         |         |          |         |          |         |          |         |          |                                                                     |
| Angle between                                                                                                   | Circle readings, telescope being set on LVII |         |         |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle    |
|                                                                                                                 | 0° 1'                                        | 180° 1' | 7° 12'  | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                     |
| LXII & LX                                                                                                       | "                                            | "       | "       | "        | "       | "        | "       | "        | "       | "        | M = 6".15<br>w = 6.34<br>$\frac{1}{w}$ = 0.16<br>C = 47° 30' 6".15  |
|                                                                                                                 | h 6.58                                       | h 4.64  | l 4.68  | l 5.62   | l 4.20  | l 7.36   | h 5.64  | h 5.30   | h 8.74  | l 6.58   |                                                                     |
|                                                                                                                 | h 6.74                                       | h 5.96  | l 4.54  | l 7.64   | l 6.02  | l 9.34   | h 5.72  | h 5.32   | h 5.78  | l 7.24   |                                                                     |
|                                                                                                                 | 6.66                                         | 5.30    | 4.61    | 6.63     | 5.11    | 8.35     | 5.68    | 5.31     | 6.93    | 6.91     |                                                                     |
| LX & LVII                                                                                                       | h 4.06                                       | h 6.60  | l 6.26  | l 4.92   | l 7.04  | l 3.16   | h 4.76  | h 5.22   | h 1.58  | l 2.78   | M = 4".73<br>w = 5.48<br>$\frac{1}{w}$ = 0.18<br>C = 60° 44' 4".73  |
|                                                                                                                 | h 5.24                                       | h 5.08  | l 6.20  | l 4.44   | l 5.40  | l 3.42   | h 4.60  | h 5.64   | h 5.90  | l 2.00   |                                                                     |
|                                                                                                                 |                                              | h 4.98  |         |          |         |          |         |          | h 5.10  |          |                                                                     |
|                                                                                                                 | 4.65                                         | 5.55    | 6.23    | 4.68     | 6.22    | 3.29     | 4.68    | 5.43     | 4.19    | 2.39     |                                                                     |
| At LIX                                                                                                          |                                              |         |         |          |         |          |         |          |         |          |                                                                     |
| <i>November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>              |                                              |         |         |          |         |          |         |          |         |          |                                                                     |
| Angle between                                                                                                   | Circle readings, telescope being set on LXI  |         |         |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle    |
|                                                                                                                 | 0° 1'                                        | 180° 1' | 7° 12'  | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 37' | 28° 48' | 208° 48' |                                                                     |
| LXI & LVIII                                                                                                     | "                                            | "       | "       | "        | "       | "        | "       | "        | "       | "        | M = 12".19<br>w = 7.00<br>$\frac{1}{w}$ = 0.14<br>C = 62° 9' 12".19 |
|                                                                                                                 | h 10.80                                      | h 10.44 | h 11.98 | h 11.52  | h 13.08 | h 13.52  | h 12.50 | h 13.24  | h 13.02 | h 13.92  |                                                                     |
|                                                                                                                 | h 11.02                                      | h 9.40  | h 10.84 | h 12.52  | h 12.54 | h 12.70  | h 11.50 | h 12.76  | h 13.10 | h 13.34  |                                                                     |
|                                                                                                                 | 10.91                                        | 9.92    | 11.41   | 12.02    | 12.81   | 13.11    | 12.00   | 13.00    | 13.06   | 13.63    |                                                                     |
| LVIII & LVI                                                                                                     | "                                            | "       | "       | "        | "       | "        | "       | "        | "       | "        | M = 7".28<br>w = 5.76<br>$\frac{1}{w}$ = 0.17<br>C = 75° 24' 7".29  |
|                                                                                                                 | h 9.22                                       | h 9.98  | h 6.50  | h 8.50   | h 7.22  | h 5.28   | h 8.30  | h 6.18   | h 8.98  | h 6.84   |                                                                     |
|                                                                                                                 | h 6.70                                       | h 9.30  | h 6.20  | h 6.92   | h 6.06  | h 5.34   | h 7.48  | h 6.32   | h 6.28  | h 7.22   |                                                                     |
|                                                                                                                 | h 7.44                                       |         |         |          |         |          |         |          | h 9.18  |          |                                                                     |
|                                                                                                                 | 7.79                                         | 9.64    | 6.35    | 7.71     | 6.64    | 5.31     | 7.89    | 6.25     | 8.15    | 7.03     |                                                                     |



| At LXI—(Continued.)                                                                                |                                              |         |          |          |          |          |          |          |          |          |                                                                                              |
|----------------------------------------------------------------------------------------------------|----------------------------------------------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |         |          |          |          |          |          |          |          |          |                                                                                              |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXIV |         |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                        | 180° 1' | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                                              |
| LVIII &<br>LIX                                                                                     | "                                            | "       | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 18''·22<br><i>w</i> = 20·40<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 60° 55' 18''·22 |
|                                                                                                    | h17·40                                       | h18·44  | h18·24   | h16·50   | l20·06   | l18·88   | l17·80   | l18·52   | l18·42   | l19·34   |                                                                                              |
|                                                                                                    | h19·00                                       | h17·86  | h18·52   | h18·32   | l18·98   | l17·58   | l18·10   | l17·30   | l17·72   | l17·44   |                                                                                              |
|                                                                                                    | 18·20                                        | 18·15   | 18·38    | 17·41    | 19·52    | 18·23    | 17·95    | 17·91    | 18·07    | 18·39    |                                                                                              |
| At LXII                                                                                            |                                              |         |          |          |          |          |          |          |          |          |                                                                                              |
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |         |          |          |          |          |          |          |          |          |                                                                                              |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LX   |         |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 150° 0'                                      | 380° 0' | 157° 12' | 387° 12' | 164° 24' | 344° 24' | 171° 35' | 351° 35' | 178° 48' | 358° 48' |                                                                                              |
| LX &<br>LVIII                                                                                      | "                                            | "       | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 29''·78<br><i>w</i> = 10·28<br>$\frac{1}{w}$ = 0·10<br><i>C</i> = 60° 19' 29''·77 |
|                                                                                                    | h30·16                                       | h29·20  | h28·96   | h29·16   | h29·68   | h26·60   | h30·42   | h28·74   | h31·60   | h31·08   |                                                                                              |
|                                                                                                    | h30·42                                       | h30·08  | h29·16   | h28·70   | h29·50   | h28·78   | h30·82   | h30·68   | h30·16   | h30·56   |                                                                                              |
|                                                                                                    | 30·29                                        | 29·64   | 29·06    | 28·93    | 29·59    | 28·22    | 30·62    | 29·71    | 30·88    | 30·82    |                                                                                              |
| LVIII &<br>LXI                                                                                     | h12·40                                       | h13·86  | h14·46   | h16·58   | h15·02   | h14·22   | h13·64   | h15·62   | h14·02   | h15·78   | <i>M</i> = 14''·23<br><i>w</i> = 8·14<br>$\frac{1}{w}$ = 0·12<br><i>C</i> = 51° 37' 14''·23  |
|                                                                                                    | h14·00                                       | h13·34  | h14·42   | h16·64   | h13·20   | h15·10   | h12·66   | h12·48   | h14·10   | h13·38   |                                                                                              |
|                                                                                                    |                                              |         |          |          |          |          | h14·32   |          |          | h13·70   |                                                                                              |
|                                                                                                    | 13·20                                        | 13·60   | 14·44    | 16·61    | 14·11    | 14·66    | 13·15    | 14·14    | 14·06    | 14·29    |                                                                                              |
| LXI &<br>LXIII                                                                                     | h56·60                                       | h55·80  | h56·44   | h56·80   | h55·96   | h54·20   | h54·68   | h54·60   | h54·56   | h55·52   | <i>M</i> = 55''·95<br><i>w</i> = 11·22<br>$\frac{1}{w}$ = 0·09<br><i>C</i> = 60° 40' 55''·95 |
|                                                                                                    | h56·82                                       | h55·60  | h56·90   | h55·64   | h56·80   | h55·04   | h57·36   | h55·16   | h56·98   | h57·00   |                                                                                              |
|                                                                                                    |                                              |         |          |          |          |          | h54·44   |          | h58·18   |          |                                                                                              |
|                                                                                                    | 56·71                                        | 55·70   | 56·67    | 56·22    | 56·38    | 54·62    | 55·49    | 54·88    | 56·57    | 56·26    |                                                                                              |
| LXIII &<br>LXV                                                                                     | h59·66                                       | h60·28  | h60·66   | h60·06   | h59·06   | h59·72   | h60·42   | h61·26   | h60·06   | h57·70   | <i>M</i> = 59''·74<br><i>w</i> = 10·40<br>$\frac{1}{w}$ = 0·10<br><i>C</i> = 64° 59' 59''·74 |
|                                                                                                    | h59·40                                       | h60·72  | h59·44   | h59·60   | h59·48   | h59·88   | h58·70   | h61·84   | h58·66   | h58·12   |                                                                                              |
|                                                                                                    |                                              |         |          |          |          |          |          |          |          |          |                                                                                              |
|                                                                                                    | 59·53                                        | 60·50   | 60·05    | 59·83    | 59·27    | 59·80    | 59·56    | 61·55    | 59·36    | 57·91    |                                                                                              |

| At LXIII                                                                                           |                                             |        |        |         |        |         |        |         |        |         |                                                                                             |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|--------|--------|---------|--------|---------|--------|---------|--------|---------|---------------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |        |        |         |        |         |        |         |        |         |                                                                                             |
| Angle between                                                                                      | Circle readings, telescope being set on LXI |        |        |         |        |         |        |         |        |         | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|                                                                                                    | 0°1'                                        | 180°1' | 7°12'  | 187°12' | 14°24' | 194°24' | 21°36' | 201°36' | 28°49' | 208°49' |                                                                                             |
| LXI & LXIV                                                                                         | "                                           | "      | "      | "       | "      | "       | "      | "       | "      | "       | <i>M</i> = 20''·48<br><i>w</i> = 9·30<br>$\frac{1}{w}$ = 0·11<br><i>C</i> = 70° 6' 20''·48  |
|                                                                                                    | h21·84                                      | h22·14 | h18·40 | h20·84  | l19·88 | l21·84  | l20·38 | l20·40  | l21·06 | l19·66  |                                                                                             |
|                                                                                                    | h20·16                                      | h20·88 | h18·76 | h20·54  | l19·66 | l21·56  | l22·14 | l19·30  | l20·32 | l19·86  |                                                                                             |
|                                                                                                    | 21·00                                       | 21·51  | 18·58  | 20·69   | 19·77  | 21·70   | 21·26  | 19·85   | 20·69  | 19·76   |                                                                                             |
| LXIV & LXVI                                                                                        | h46·48                                      | h44·40 | h46·82 | h46·84  | l47·80 | l46·88  | l46·60 | l47·74  | l46·92 | l47·86  | <i>M</i> = 46''·94<br><i>w</i> = 8·00<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 66° 26' 46''·94 |
|                                                                                                    | h46·26                                      | h45·12 | h48·90 | h47·40  | l48·46 | l45·92  | l46·50 | l48·24  | l45·74 | l47·96  |                                                                                             |
|                                                                                                    | 46·37                                       | 44·76  | 47·86  | 47·12   | 48·13  | 46·40   | 46·55  | 47·99   | 46·33  | 47·91   |                                                                                             |
| LXVI & LXVII                                                                                       | h 2·34                                      | h 4·20 | h 5·14 | h 3·14  | l 3·42 | l 4·40  | l 4·64 | l 3·06  | l 2·56 | l 3·38  | <i>M</i> = 3''·48<br><i>w</i> = 14·30<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 65° 9' 3''·48   |
|                                                                                                    | h 3·90                                      | h 3·20 | h 3·20 | h 3·46  | l 2·56 | l 5·36  | l 3·54 | l 1·92  | l 3·64 | l 2·46  |                                                                                             |
|                                                                                                    | 3·12                                        | 3·70   | 4·17   | 3·30    | 2·99   | 4·88    | 4·09   | 2·49    | 3·10   | 2·92    |                                                                                             |
| LXVII & LXV                                                                                        | h22·40                                      | h20·92 | h20·22 | h20·28  | l21·20 | l21·06  | l21·04 | l22·08  | l22·50 | l24·14  | <i>M</i> = 21''·78<br><i>w</i> = 7·80<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 45° 5' 21''·78  |
|                                                                                                    | h21·92                                      | h22·40 | h20·64 | h20·16  | l22·48 | l21·06  | l21·94 | l22·58  | l22·94 | l23·70  |                                                                                             |
|                                                                                                    | 22·16                                       | 21·66  | 20·43  | 20·22   | 21·84  | 21·06   | 21·49  | 22·33   | 22·72  | 23·92   |                                                                                             |
| LXV & LXII                                                                                         | h 5·54                                      | h 7·24 | h 8·34 | h 8·36  | l 7·64 | l 6·20  | l 8·80 | l 5·26  | l 6·72 | l 5·76  | <i>M</i> = 7''·12<br><i>w</i> = 8·05<br>$\frac{1}{w}$ = 0·12<br><i>C</i> = 53° 40' 7''·12   |
|                                                                                                    | h 5·94                                      | h 6·32 | h 7·98 | h 8·36  | l 7·24 | l 8·62  | l 7·34 | l 7·10  | l 7·84 | l 5·22  |                                                                                             |
|                                                                                                    | 5·74                                        | 6·78   | 8·16   | 8·36    | 7·44   | 7·67    | 8·07   | 6·18    | 7·28   | 5·49    |                                                                                             |
| LXII & LXI                                                                                         | h21·90                                      | h21·18 | h20·42 | h18·94  | l20·02 | l19·58  | l16·94 | l21·96  | l20·14 | l18·32  | <i>M</i> = 20''·11<br><i>w</i> = 5·43<br>$\frac{1}{w}$ = 0·18<br><i>C</i> = 59° 32' 20''·10 |
|                                                                                                    | h22·12                                      | h21·68 | h21·26 | h20·42  | l18·40 | l17·72  | l19·04 | l21·18  | l19·32 | l20·18  |                                                                                             |
|                                                                                                    | 22·01                                       | 21·43  | 20·84  | 19·68   | 19·21  | 18·65   | 18·76  | 21·57   | 19·73  | 19·25   |                                                                                             |



| At LXIV                                                                                            |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
|----------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXVI |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                    | 0° 1'                                        | 180° 1'         | 7° 12'          | 187° 12'        | 14° 24'         | 194° 24'        | 21° 36'         | 201° 36'        | 28° 48'         | 208° 48'        |                                                                                       |
| LXVI &<br>LXIII                                                                                    | "                                            | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 41".54                                                                     |
|                                                                                                    | <i>h</i> 39° 96                              | <i>h</i> 40° 20 | <i>h</i> 41° 34 | <i>h</i> 42° 04 | <i>h</i> 43° 54 | <i>h</i> 43° 22 | <i>h</i> 40° 90 | <i>h</i> 40° 20 | <i>h</i> 40° 38 | <i>h</i> 41° 76 | <i>w</i> = 5.60                                                                       |
|                                                                                                    | <i>h</i> 39° 24                              | <i>h</i> 40° 14 | <i>h</i> 42° 36 | <i>h</i> 42° 90 | <i>h</i> 40° 26 | <i>h</i> 42° 68 | <i>h</i> 41° 50 | <i>h</i> 42° 68 | <i>h</i> 42° 34 | <i>h</i> 42° 54 | $\frac{1}{w}$ = 0.18                                                                  |
|                                                                                                    | <i>h</i> 38° 18                              |                 |                 | <i>h</i> 44° 36 |                 |                 |                 |                 |                 |                 | <i>C</i> = 62° 24' 41".53                                                             |
|                                                                                                    | 39° 13                                       | 40° 17          | 41° 85          | 42° 47          | 42° 72          | 42° 95          | 41° 20          | 41° 44          | 41° 36          | 42° 15          |                                                                                       |
| LXIII &<br>LXI                                                                                     | <i>h</i> 30° 48                              | <i>h</i> 30° 76 | <i>h</i> 29° 58 | <i>h</i> 29° 66 | <i>h</i> 28° 38 | <i>h</i> 30° 78 | <i>h</i> 30° 64 | <i>h</i> 32° 06 | <i>h</i> 31° 46 | <i>h</i> 31° 88 | <i>M</i> = 30".56                                                                     |
|                                                                                                    | <i>h</i> 33° 34                              | <i>h</i> 31° 06 | <i>h</i> 29° 36 | <i>h</i> 29° 04 | <i>h</i> 30° 96 | <i>h</i> 30° 74 | <i>h</i> 31° 28 | <i>h</i> 30° 04 | <i>h</i> 30° 58 | <i>h</i> 30° 74 | <i>w</i> = 8.58                                                                       |
|                                                                                                    | <i>h</i> 31° 36                              |                 |                 | <i>h</i> 27° 72 |                 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0.12                                                                  |
|                                                                                                    | 31° 73                                       | 30° 91          | 29° 47          | 29° 35          | 29° 02          | 30° 76          | 30° 96          | 31° 05          | 31° 02          | 31° 31          | <i>C</i> = 72° 22' 30".56                                                             |
|                                                                                                    |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| At LXV                                                                                             |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                    | 0° 1'                                        | 180° 1'         | 7° 12'          | 187° 12'        | 14° 24'         | 194° 24'        | 21° 36'         | 201° 36'        | 28° 48'         | 208° 48'        |                                                                                       |
| LXII &<br>LXIII                                                                                    | "                                            | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 53".68                                                                     |
|                                                                                                    | <i>h</i> 55° 56                              | <i>h</i> 54° 16 | <i>h</i> 53° 42 | <i>h</i> 52° 54 | <i>h</i> 53° 80 | <i>h</i> 51° 96 | <i>h</i> 52° 60 | <i>h</i> 53° 46 | <i>l</i> 55° 66 | <i>l</i> 52° 94 | <i>w</i> = 6.60                                                                       |
|                                                                                                    | <i>h</i> 56° 30                              | <i>h</i> 54° 22 | <i>h</i> 53° 50 | <i>h</i> 52° 38 | <i>h</i> 54° 34 | <i>h</i> 52° 68 | <i>h</i> 54° 36 | <i>h</i> 54° 30 | <i>l</i> 53° 98 | <i>l</i> 51° 48 | $\frac{1}{w}$ = 0.15                                                                  |
|                                                                                                    | 55° 93                                       | 54° 19          | 53° 46          | 52° 46          | 54° 07          | 52° 32          | 53° 48          | 53° 88          | 54° 82          | 52° 21          | <i>C</i> = 61° 19' 53".68                                                             |
| LXIII &<br>LXVII                                                                                   | <i>h</i> 4° 20                               | <i>h</i> 2° 98  | <i>h</i> 5° 56  | <i>h</i> 6° 90  | <i>h</i> 6° 16  | <i>h</i> 6° 60  | <i>h</i> 7° 36  | <i>h</i> 3° 90  | <i>l</i> 3° 26  | <i>l</i> 6° 00  | <i>M</i> = 5".12                                                                      |
|                                                                                                    | <i>h</i> 3° 02                               | <i>h</i> 3° 74  | <i>h</i> 5° 72  | <i>h</i> 6° 66  | <i>h</i> 5° 58  | <i>h</i> 6° 34  | <i>h</i> 5° 68  | <i>h</i> 4° 02  | <i>l</i> 3° 58  | <i>l</i> 5° 20  | <i>w</i> = 5.00                                                                       |
|                                                                                                    |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0.20                                                                  |
|                                                                                                    | 3° 61                                        | 3° 36           | 5° 64           | 6° 78           | 5° 87           | 6° 47           | 6° 52           | 3° 96           | 3° 42           | 5° 60           | <i>C</i> = 56° 25' 5".12                                                              |

| At LXVI                                                                                            |                                                |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                                                          |
|----------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                                                          |
| Angle between                                                                                      | Circle readings, telescope being set on LXVIII |                    |                    |                    |                    |                    |                    |                    |                    |                    | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle                                                    |
|                                                                                                    | 0° 1'                                          | 180° 1'            | 7° 12'             | 187° 12'           | 14° 24'            | 194° 24'           | 21° 36'            | 201° 36'           | 28° 48'            | 208° 48'           |                                                                                                                                          |
| LXVIII & LXIX                                                                                      | "                                              | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | <i>M</i> = 29'' <sup>12</sup><br><i>w</i> = 7 <sup>50</sup><br>$\frac{1}{w}$ = 0 <sup>13</sup><br><i>C</i> = 23° 49' 29'' <sup>12</sup>  |
|                                                                                                    | l 27 <sup>40</sup>                             | l 28 <sup>58</sup> | h 28 <sup>28</sup> | h 27 <sup>98</sup> | h 31 <sup>26</sup> | h 29 <sup>28</sup> | l 29 <sup>90</sup> | l 29 <sup>82</sup> | l 28 <sup>10</sup> | l 29 <sup>34</sup> |                                                                                                                                          |
|                                                                                                    | l 29 <sup>20</sup>                             | l 28 <sup>88</sup> | h 29 <sup>12</sup> | h 27 <sup>70</sup> | h 30 <sup>36</sup> | h 30 <sup>74</sup> | l 30 <sup>36</sup> | l 28 <sup>54</sup> | l 26 <sup>96</sup> | l 30 <sup>62</sup> |                                                                                                                                          |
|                                                                                                    | 28 <sup>30</sup>                               | 28 <sup>73</sup>   | 28 <sup>70</sup>   | 27 <sup>84</sup>   | 30 <sup>81</sup>   | 30 <sup>01</sup>   | 30 <sup>13</sup>   | 29 <sup>18</sup>   | 27 <sup>53</sup>   | 29 <sup>98</sup>   |                                                                                                                                          |
| LXIX & LXVII                                                                                       | l 15 <sup>12</sup>                             | l 10 <sup>70</sup> | h 11 <sup>92</sup> | h 13 <sup>46</sup> | h 10 <sup>52</sup> | h 12 <sup>86</sup> | l 15 <sup>20</sup> | l 13 <sup>50</sup> | l 15 <sup>68</sup> | l 14 <sup>36</sup> | <i>M</i> = 13'' <sup>10</sup><br><i>w</i> = 3 <sup>32</sup><br>$\frac{1}{w}$ = 0 <sup>30</sup><br><i>C</i> = 60° 21' 13'' <sup>10</sup>  |
|                                                                                                    | l 11 <sup>78</sup>                             | l 11 <sup>80</sup> | h 12 <sup>58</sup> | h 13 <sup>20</sup> | h 11 <sup>20</sup> | h 11 <sup>20</sup> | l 12 <sup>02</sup> | l 13 <sup>80</sup> | l 17 <sup>40</sup> | l 14 <sup>08</sup> |                                                                                                                                          |
|                                                                                                    | l 12 <sup>46</sup>                             |                    |                    |                    |                    |                    | l 14 <sup>02</sup> |                    |                    |                    |                                                                                                                                          |
|                                                                                                    | 13 <sup>12</sup>                               | 11 <sup>25</sup>   | 12 <sup>25</sup>   | 13 <sup>33</sup>   | 10 <sup>86</sup>   | 12 <sup>03</sup>   | 13 <sup>75</sup>   | 13 <sup>65</sup>   | 16 <sup>54</sup>   | 14 <sup>22</sup>   |                                                                                                                                          |
| LXVII & LXIII                                                                                      | h 51 <sup>14</sup>                             | h 53 <sup>30</sup> | h 53 <sup>56</sup> | h 51 <sup>64</sup> | h 52 <sup>20</sup> | h 51 <sup>96</sup> | l 51 <sup>84</sup> | l 51 <sup>70</sup> | l 52 <sup>38</sup> | l 51 <sup>10</sup> | <i>M</i> = 52'' <sup>28</sup><br><i>w</i> = 12 <sup>80</sup><br>$\frac{1}{w}$ = 0 <sup>08</sup><br><i>C</i> = 65° 23' 52'' <sup>28</sup> |
|                                                                                                    | h 52 <sup>26</sup>                             | h 54 <sup>20</sup> | h 53 <sup>34</sup> | h 51 <sup>82</sup> | h 52 <sup>76</sup> | h 53 <sup>24</sup> | l 52 <sup>38</sup> | l 51 <sup>90</sup> | l 50 <sup>14</sup> | l 51 <sup>64</sup> |                                                                                                                                          |
|                                                                                                    |                                                |                    |                    |                    |                    |                    |                    | l 52 <sup>96</sup> |                    |                    |                                                                                                                                          |
|                                                                                                    | 51 <sup>70</sup>                               | 53 <sup>75</sup>   | 53 <sup>45</sup>   | 51 <sup>73</sup>   | 52 <sup>48</sup>   | 52 <sup>60</sup>   | 52 <sup>11</sup>   | 51 <sup>80</sup>   | 51 <sup>83</sup>   | 51 <sup>37</sup>   |                                                                                                                                          |
| LXIII & LXIV                                                                                       | h 33 <sup>18</sup>                             | h 32 <sup>34</sup> | h 29 <sup>26</sup> | h 31 <sup>46</sup> | h 31 <sup>32</sup> | h 32 <sup>58</sup> | l 29 <sup>20</sup> | l 31 <sup>26</sup> | l 31 <sup>08</sup> | l 31 <sup>04</sup> | <i>M</i> = 30'' <sup>93</sup><br><i>w</i> = 7 <sup>14</sup><br>$\frac{1}{w}$ = 0 <sup>14</sup><br><i>C</i> = 51° 8' 30'' <sup>92</sup>   |
|                                                                                                    | h 32 <sup>04</sup>                             | h 30 <sup>46</sup> | h 28 <sup>32</sup> | h 30 <sup>52</sup> | h 31 <sup>06</sup> | h 31 <sup>50</sup> | l 31 <sup>44</sup> | l 29 <sup>78</sup> | l 31 <sup>40</sup> | l 30 <sup>28</sup> |                                                                                                                                          |
|                                                                                                    |                                                |                    |                    |                    |                    | l 28 <sup>78</sup> |                    |                    |                    |                    |                                                                                                                                          |
|                                                                                                    | 32 <sup>61</sup>                               | 31 <sup>40</sup>   | 28 <sup>79</sup>   | 30 <sup>99</sup>   | 31 <sup>19</sup>   | 32 <sup>04</sup>   | 29 <sup>81</sup>   | 30 <sup>52</sup>   | 31 <sup>24</sup>   | 30 <sup>66</sup>   |                                                                                                                                          |
| At LXVII                                                                                           |                                                |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                                                          |
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                                                          |
| Angle between                                                                                      | Circle readings, telescope being set on LXV    |                    |                    |                    |                    |                    |                    |                    |                    |                    | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle                                                    |
|                                                                                                    | 144° 27'                                       | 324° 27'           | 151° 38'           | 331° 38'           | 158° 50'           | 388° 50'           | 166° 2'            | 346° 2'            | 173° 14'           | 353° 14'           |                                                                                                                                          |
| LXV & LXIII                                                                                        | "                                              | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | <i>M</i> = 34'' <sup>61</sup><br><i>w</i> = 7 <sup>30</sup><br>$\frac{1}{w}$ = 0 <sup>14</sup><br><i>C</i> = 78° 29' 34'' <sup>61</sup>  |
|                                                                                                    | h 34 <sup>94</sup>                             | h 32 <sup>38</sup> | h 36 <sup>72</sup> | h 34 <sup>46</sup> | h 35 <sup>72</sup> | h 34 <sup>46</sup> | h 34 <sup>24</sup> | h 35 <sup>06</sup> | h 34 <sup>02</sup> | h 35 <sup>50</sup> |                                                                                                                                          |
|                                                                                                    | h 34 <sup>46</sup>                             | h 33 <sup>44</sup> | h 36 <sup>00</sup> | h 33 <sup>00</sup> | h 36 <sup>44</sup> | h 35 <sup>16</sup> | h 36 <sup>02</sup> | h 34 <sup>06</sup> | h 33 <sup>42</sup> | h 32 <sup>76</sup> |                                                                                                                                          |
|                                                                                                    | 34 <sup>70</sup>                               | 32 <sup>91</sup>   | 36 <sup>36</sup>   | 33 <sup>73</sup>   | 36 <sup>08</sup>   | 34 <sup>81</sup>   | 35 <sup>13</sup>   | 34 <sup>56</sup>   | 33 <sup>72</sup>   | 34 <sup>13</sup>   |                                                                                                                                          |

## At LXVII—(Continued.)

December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between                                                                               | Circle readings, telescope being set on LXV |                               |                      |                                  |                      |                      |                                  |                      |                      |                      | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle      |
|---------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------|----------------------|----------------------------------|----------------------|----------------------|----------------------------------|----------------------|----------------------|----------------------|-----------------------------------------------------------------------------|
|                                                                                             | 144° 27'                                    | 324° 27'                      | 151° 38'             | 331° 38'                         | 158° 50'             | 338° 50'             | 166° 2'                          | 346° 2'              | 178° 14'             | 353° 14'             |                                                                             |
| LXIII & LXVI                                                                                | "                                           | "                             | "                    | "                                | "                    | "                    | "                                | "                    | "                    | "                    | $M$ = 4" 15<br>$w$ = 7 03<br>$\frac{1}{w}$ = 0 14<br>$C$ = 49° 27' 4" 15    |
|                                                                                             | h 3° 90<br>h 3° 46                          | h 5° 88<br>h 3° 48<br>h 5° 60 | h 2° 06<br>h 2° 94   | h 5° 56<br>h 6° 20               | h 2° 76<br>h 2° 12   | h 4° 16<br>h 3° 30   | h 4° 58<br>h 3° 44               | h 4° 40<br>h 4° 40   | h 5° 30<br>h 5° 44   | h 4° 02<br>h 5° 00   |                                                                             |
|                                                                                             | 3·68                                        | 4·99                          | 2·50                 | 5·88                             | 2·44                 | 3·73                 | 4·01                             | 4·40                 | 5·37                 | 4·51                 |                                                                             |
| LXVI & LXVIII                                                                               | h 18° 54<br>h 20° 80<br>h 19° 96            | h 18° 40<br>h 18° 76          | h 20° 48<br>h 19° 08 | h 18° 80<br>h 18° 18             | h 17° 72<br>h 18° 98 | h 18° 82<br>h 19° 06 | h 19° 24<br>h 19° 06             | h 18° 58<br>h 18° 68 | h 17° 90<br>h 18° 20 | h 18° 62<br>h 19° 18 | $M$ = 18" 86<br>$w$ = 22 42<br>$\frac{1}{w}$ = 0 04<br>$C$ = 44° 55' 18" 87 |
|                                                                                             | 19·77                                       | 18·58                         | 19·78                | 18·49                            | 18·35                | 18·94                | 19·15                            | 18·63                | 18·05                | 18·90                |                                                                             |
| LXVIII & LXIX                                                                               | h 20° 70<br>h 19° 78                        | h 21° 24<br>h 21° 04          | h 20° 42<br>h 21° 88 | h 18° 76<br>h 21° 12<br>h 20° 56 | h 22° 42<br>h 22° 66 | h 20° 78<br>h 20° 22 | h 21° 78<br>h 20° 18             | h 20° 14<br>h 19° 94 | h 20° 94<br>h 21° 84 | h 20° 84<br>h 20° 66 | $M$ = 20" 89<br>$w$ = 14 21<br>$\frac{1}{w}$ = 0 07<br>$C$ = 38° 10' 20" 88 |
|                                                                                             | 20·24                                       | 21·14                         | 21·15                | 20·15                            | 22·54                | 20·50                | 20·98                            | 20·04                | 21·39                | 20·75                |                                                                             |
| At LXVIII                                                                                   |                                             |                               |                      |                                  |                      |                      |                                  |                      |                      |                      |                                                                             |
| December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                             |                               |                      |                                  |                      |                      |                                  |                      |                      |                      |                                                                             |
| Angle between                                                                               | Circle readings, telescope being set on LXX |                               |                      |                                  |                      |                      |                                  |                      |                      |                      | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle      |
|                                                                                             | 0° 1'                                       | 180° 1'                       | 7° 12'               | 187° 12'                         | 14° 24'              | 194° 24'             | 21° 36'                          | 201° 36'             | 28° 48'              | 208° 48'             |                                                                             |
| LXX & LXXI                                                                                  | "                                           | "                             | "                    | "                                | "                    | "                    | "                                | "                    | "                    | "                    | $M$ = 52" 10<br>$w$ = 11 15<br>$\frac{1}{w}$ = 0 09<br>$C$ = 42° 15' 52" 10 |
|                                                                                             | h 52° 24<br>h 51° 94                        | h 50° 32<br>h 50° 80          | h 50° 56<br>h 52° 04 | h 52° 68<br>h 53° 50             | h 51° 84<br>h 51° 98 | h 52° 74<br>h 52° 58 | l 52° 88<br>l 50° 82<br>l 51° 40 | l 53° 06<br>l 53° 22 | l 50° 82<br>l 52° 02 | l 52° 86<br>l 53° 34 |                                                                             |
|                                                                                             | 52·09                                       | 50·56                         | 51·30                | 53·09                            | 51·91                | 52·66                | 51·70                            | 53·14                | 51·42                | 53·10                |                                                                             |

| At LXVIII—(Continued.)                                                                             |                                               |                |                |                |                |                |                |                |                |                                  |                                                                                              |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------------------|----------------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                |                |                |                |                |                |                |                |                                  |                                                                                              |
| Angle between                                                                                      | Circle readings, telescope being set on LXX   |                |                |                |                |                |                |                |                |                                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                         | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'                         |                                                                                              |
| LXXI & LXIX                                                                                        | "                                             | "              | "              | "              | "              | "              | "              | "              | "              | "                                | <i>M</i> = 44''·99<br><i>w</i> = 9·05<br>$\frac{1}{w}$ = 0·11<br><i>C</i> = 43° 45' 44''·99  |
|                                                                                                    | <i>h</i> 44·80                                | <i>h</i> 44·52 | <i>h</i> 44·88 | <i>h</i> 43·30 | <i>h</i> 45·88 | <i>h</i> 44·14 | <i>l</i> 44·64 | <i>l</i> 44·80 | <i>l</i> 46·70 | <i>l</i> 43·54                   |                                                                                              |
|                                                                                                    | <i>h</i> 46·06                                | <i>h</i> 45·78 | <i>h</i> 44·10 | <i>h</i> 43·38 | <i>h</i> 44·94 | <i>h</i> 44·34 | <i>l</i> 46·10 | <i>l</i> 44·40 | <i>l</i> 47·34 | <i>l</i> 46·20<br><i>l</i> 44·90 |                                                                                              |
|                                                                                                    | 45·43                                         | 45·15          | 44·49          | 43·34          | 45·41          | 44·24          | 45·37          | 44·60          | 47·02          | 44·88                            |                                                                                              |
| LXIX & LXVII                                                                                       | <i>h</i> 17·24                                | <i>h</i> 17·06 | <i>h</i> 17·34 | <i>h</i> 16·48 | <i>h</i> 16·62 | <i>h</i> 16·66 | <i>l</i> 17·22 | <i>l</i> 15·48 | <i>l</i> 16·58 | <i>l</i> 18·50                   | <i>M</i> = 16''·70<br><i>w</i> = 17·48<br>$\frac{1}{w}$ = 0·06<br><i>C</i> = 81° 30' 16''·70 |
|                                                                                                    | <i>h</i> 16·60                                | <i>h</i> 17·24 | <i>h</i> 17·00 | <i>h</i> 16·90 | <i>h</i> 18·52 | <i>h</i> 16·42 | <i>l</i> 16·26 | <i>l</i> 16·02 | <i>l</i> 14·80 | <i>l</i> 15·90<br><i>l</i> 15·80 |                                                                                              |
|                                                                                                    | 16·92                                         | 17·15          | 17·17          | 16·69          | 17·57          | 16·54          | 16·74          | 15·75          | 15·69          | 16·73                            |                                                                                              |
| LXVII & LXVI                                                                                       | <i>h</i> 61·28                                | <i>h</i> 61·72 | <i>h</i> 60·46 | <i>h</i> 61·46 | <i>h</i> 59·98 | <i>h</i> 58·48 | <i>l</i> 60·70 | <i>l</i> 61·40 | <i>l</i> 61·56 | <i>l</i> 58·66                   | <i>M</i> = 0''·46<br><i>w</i> = 8·10<br>$\frac{1}{w}$ = 0·12<br><i>C</i> = 50° 54' 0''·46    |
|                                                                                                    | <i>h</i> 60·24                                | <i>h</i> 60·06 | <i>h</i> 60·10 | <i>h</i> 60·50 | <i>h</i> 57·76 | <i>h</i> 59·34 | <i>l</i> 61·14 | <i>l</i> 62·08 | <i>l</i> 61·60 | <i>l</i> 60·58                   |                                                                                              |
|                                                                                                    | 60·76                                         | 60·89          | 60·28          | 60·98          | 58·87          | 58·91          | 60·92          | 61·74          | 61·58          | 59·62                            |                                                                                              |
| At LXIX                                                                                            |                                               |                |                |                |                |                |                |                |                |                                  |                                                                                              |
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                |                |                |                |                |                |                |                |                                  |                                                                                              |
| Angle between                                                                                      | Circle readings, telescope being set on LXVII |                |                |                |                |                |                |                |                |                                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                         | 180° 1'        | 7° 12'         | 187° 12'       | 14° 25'        | 194° 25'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'                         |                                                                                              |
| LXVII & LXVI                                                                                       | "                                             | "              | "              | "              | "              | "              | "              | "              | "              | "                                | <i>M</i> = 9''·01<br><i>w</i> = 6·15<br>$\frac{1}{w}$ = 0·16<br><i>C</i> = 36° 33' 9''·01    |
|                                                                                                    | <i>h</i> 8·80                                 | <i>h</i> 7·02  | <i>h</i> 7·92  | <i>h</i> 7·76  | <i>h</i> 8·34  | <i>h</i> 11·06 | <i>l</i> 8·98  | <i>l</i> 7·12  | <i>l</i> 9·64  | <i>l</i> 9·94                    |                                                                                              |
|                                                                                                    | <i>h</i> 9·98                                 | <i>h</i> 7·36  | <i>h</i> 7·86  | <i>h</i> 8·56  | <i>h</i> 9·16  | <i>l</i> 10·22 | <i>l</i> 11·06 | <i>l</i> 11·10 | <i>l</i> 7·62  | <i>l</i> 11·06<br><i>l</i> 8·68  |                                                                                              |
|                                                                                                    | 9·39                                          | 7·19           | 7·89           | 8·16           | 8·75           | 10·64          | 10·02          | 8·97           | 8·63           | 10·47                            |                                                                                              |

| <i>At LXIX—(Continued.)</i>                                                                        |                                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXVII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                         | 180° 1'         | 7° 12'          | 187° 12'        | 14° 25'         | 194° 25'        | 21° 36'         | 201° 36'        | 28° 48'         | 208° 48'        |                                                                                              |
| LXVI &<br>LXVIII                                                                                   | "                                             | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 13''·77<br><i>w</i> = 7·12<br>$\frac{1}{w}$ = 0·14<br><i>C</i> = 23° 46' 13''·75  |
|                                                                                                    | <i>h</i> 13'·40                               | <i>h</i> 14'·66 | <i>h</i> 14'·42 | <i>h</i> 14'·56 | <i>h</i> 15'·18 | <i>h</i> 13'·68 | <i>l</i> 13'·72 | <i>l</i> 15'·14 | <i>l</i> 13'·56 | <i>l</i> 10'·86 |                                                                                              |
|                                                                                                    | <i>h</i> 13'·58                               | <i>h</i> 13'·66 | <i>h</i> 14'·68 | <i>h</i> 14'·62 | <i>h</i> 13'·56 | <i>h</i> 15'·40 | <i>l</i> 13'·34 | <i>l</i> 12'·88 | <i>l</i> 15'·00 | <i>l</i> 12'·18 |                                                                                              |
|                                                                                                    |                                               |                 |                 |                 |                 |                 |                 | <i>l</i> 12'·44 |                 | <i>l</i> 10'·20 |                                                                                              |
|                                                                                                    | 13'·49                                        | 14'·16          | 14'·55          | 14'·59          | 14'·37          | 14'·54          | 13'·53          | 12'·67          | 14'·28          | 11'·52          |                                                                                              |
| LXVIII &<br>LXX                                                                                    | <i>h</i> 17'·32                               | <i>h</i> 14'·86 | <i>h</i> 16'·48 | <i>h</i> 14'·58 | <i>h</i> 18'·26 | <i>h</i> 15'·50 | <i>l</i> 16'·60 | <i>l</i> 16'·22 | <i>l</i> 18'·26 | <i>l</i> 19'·70 | <i>M</i> = 16''·64<br><i>w</i> = 7·85<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 58° 19' 16''·64  |
|                                                                                                    | <i>h</i> 16'·12                               | <i>h</i> 16'·20 | <i>h</i> 16'·32 | <i>h</i> 15'·64 | <i>h</i> 17'·56 | <i>h</i> 17'·26 | <i>l</i> 16'·46 | <i>l</i> 16'·40 | <i>l</i> 15'·50 | <i>l</i> 17'·48 |                                                                                              |
|                                                                                                    |                                               |                 |                 |                 |                 |                 |                 |                 | <i>l</i> 16'·88 |                 |                                                                                              |
|                                                                                                    | 16'·72                                        | 15'·53          | 16'·40          | 15'·11          | 17'·91          | 16'·38          | 16'·53          | 16'·31          | 16'·88          | 18'·59          |                                                                                              |
| LXX &<br>LXXI                                                                                      | <i>h</i> 21'·18                               | <i>h</i> 24'·24 | <i>h</i> 22'·94 | <i>h</i> 21'·36 | <i>h</i> 20'·04 | <i>h</i> 21'·58 | <i>l</i> 22'·34 | <i>l</i> 21'·54 | <i>l</i> 20'·20 | <i>l</i> 20'·86 | <i>M</i> = 21''·75<br><i>w</i> = 12·74<br>$\frac{1}{w}$ = 0·08<br><i>C</i> = 30° 27' 21''·77 |
|                                                                                                    | <i>h</i> 21'·32                               | <i>h</i> 21'·68 | <i>h</i> 20'·98 | <i>h</i> 21'·22 | <i>h</i> 21'·22 | <i>h</i> 20'·96 | <i>l</i> 21'·72 | <i>l</i> 23'·44 | <i>l</i> 22'·36 | <i>l</i> 22'·52 |                                                                                              |
|                                                                                                    |                                               | <i>h</i> 22'·64 |                 |                 |                 |                 |                 |                 | <i>l</i> 23'·64 |                 |                                                                                              |
|                                                                                                    | 21'·25                                        | 22'·85          | 21'·96          | 21'·29          | 20'·63          | 21'·27          | 22'·03          | 22'·49          | 22'·07          | 21'·69          |                                                                                              |
| <i>At LXX</i>                                                                                      |                                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXXII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                         | 180° 1'         | 7° 12'          | 187° 12'        | 14° 24'         | 194° 24'        | 21° 36'         | 201° 36'        | 28° 48'         | 208° 48'        |                                                                                              |
| LXXII &<br>LXXIII                                                                                  | "                                             | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 35''·02<br><i>w</i> = 13·96<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 40° 31' 35''·02 |
|                                                                                                    | <i>h</i> 35'·52                               | <i>h</i> 34'·24 | <i>h</i> 34'·42 | <i>h</i> 35'·24 | <i>h</i> 35'·16 | <i>l</i> 35'·50 | <i>l</i> 36'·18 | <i>l</i> 33'·56 | <i>l</i> 35'·26 | <i>l</i> 35'·16 |                                                                                              |
|                                                                                                    | <i>h</i> 36'·72                               | <i>h</i> 35'·36 | <i>h</i> 33'·78 | <i>h</i> 36'·34 | <i>h</i> 34'·02 | <i>l</i> 34'·94 | <i>l</i> 36'·14 | <i>l</i> 34'·32 | <i>l</i> 34'·22 | <i>l</i> 34'·58 |                                                                                              |
|                                                                                                    |                                               | <i>h</i> 34'·54 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
|                                                                                                    | 36'·12                                        | 34'·71          | 34'·10          | 35'·79          | 34'·59          | 35'·22          | 36'·16          | 33'·94          | 34'·74          | 34'·87          |                                                                                              |
| LXXIII &<br>LXXI                                                                                   | <i>h</i> 2'·08                                | <i>h</i> 2'·76  | <i>h</i> 2'·58  | <i>h</i> 0'·76  | <i>h</i> 1'·84  | <i>l</i> 1'·58  | <i>l</i> 1'·22  | <i>l</i> 3'·16  | <i>l</i> 3'·48  | <i>l</i> 2'·36  | <i>M</i> = 2''·22<br><i>w</i> = 9·75<br>$\frac{1}{w}$ = 0·10<br><i>C</i> = 65° 28' 2''·23    |
|                                                                                                    | <i>h</i> 1'·76                                | <i>h</i> 3'·20  | <i>h</i> 3'·34  | <i>h</i> 1'·08  | <i>h</i> 3'·98  | <i>l</i> 0'·54  | <i>l</i> 1'·20  | <i>l</i> 1'·98  | <i>l</i> 3'·24  | <i>l</i> 1'·44  |                                                                                              |
|                                                                                                    |                                               |                 |                 | <i>h</i> 4'·10  |                 |                 |                 |                 |                 |                 |                                                                                              |
|                                                                                                    | 1'·92                                         | 2'·98           | 2'·96           | 0'·92           | 3'·31           | 1'·06           | 1'·21           | 2'·57           | 3'·36           | 1'·90           |                                                                                              |

At LXX—(Continued.)

December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on LXXII |                               |                    |                    |                    |                    |                    |                    |                    |                             | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle       |
|---------------|-----------------------------------------------|-------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-----------------------------|------------------------------------------------------------------------|
|               | 0° 1'                                         | 180° 1'                       | 7° 12'             | 187° 12'           | 14° 24'            | 194° 24'           | 21° 36'            | 201° 36'           | 28° 48'            | 208° 48'                    |                                                                        |
| LXXI & LXIX   | "                                             | "                             | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                           | M = 13''·02<br>w = 6·62<br>$\frac{1}{w}$ = 0·15<br>C = 27° 48' 13''·01 |
|               | h 11'70<br>h 13'26                            | h 10'00<br>h 12'14<br>h 11'44 | h 12'64<br>h 11'44 | h 12'88<br>h 12'68 | h 13'12<br>h 12'78 | l 14'76<br>l 16'06 | l 14'58<br>l 14'04 | l 13'06<br>l 13'62 | l 12'18<br>l 13'28 | l 13'24<br>l 12'62          |                                                                        |
|               | 12'48                                         | 11'19                         | 12'04              | 12'78              | 12'95              | 15'41              | 14'31              | 13'34              | 12'73              | 12'93                       |                                                                        |
| LXIX & LXVIII | h 8'12<br>h 6'60                              | h 10'08<br>h 7'80<br>h 9'40   | h 7'22<br>h 9'16   | h 9'76<br>h 9'60   | h 8'26<br>h 7'98   | l 6'92<br>l 5'70   | l 6'32<br>l 5'28   | l 7'72<br>l 6'80   | l 7'72<br>l 6'58   | l 7'64<br>l 10'16<br>l 9'30 | M = 7''·80<br>w = 5·46<br>$\frac{1}{w}$ = 0·18<br>C = 35° 39' 7''·81   |
|               | 7'36                                          | 9'09                          | 8'19               | 9'68               | 8'12               | 6'31               | 5'80               | 7'26               | 7'15               | 9'03                        |                                                                        |

At LXXI

December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on LXIX |                    |                    |                    |                    |                    |                               |                    |                    |                    | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle        |
|---------------|----------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------------------|--------------------|--------------------|--------------------|-------------------------------------------------------------------------|
|               | 78° 17'                                      | 253° 17'           | 80° 28'            | 280° 28'           | 87° 40'            | 267° 40'           | 94° 52'                       | 274° 52'           | 102° 4'            | 282° 4'            |                                                                         |
| LXIX & LXVIII | "                                            | "                  | "                  | "                  | "                  | "                  | "                             | "                  | "                  | "                  | M = 37''·01<br>w = 16·82<br>$\frac{1}{w}$ = 0·06<br>C = 47° 27' 37''·00 |
|               | h 37'50<br>h 37'80                           | h 37'20<br>h 37'04 | h 36'74<br>h 37'30 | h 35'68<br>h 35'82 | h 37'30<br>h 38'18 | h 37'02<br>h 37'04 | h 37'20<br>h 34'94<br>h 35'60 | h 36'48<br>h 37'58 | h 37'48<br>h 36'76 | h 37'16<br>h 38'34 |                                                                         |
|               | 37'65                                        | 37'12              | 37'02              | 35'75              | 37'74              | 37'03              | 35'91                         | 37'03              | 37'12              | 37'75              |                                                                         |
| LXVIII & LXX  | h 46'66<br>h 47'16                           | h 47'74<br>h 47'26 | h 47'20<br>h 48'76 | h 48'06<br>h 48'24 | h 47'66<br>h 46'68 | h 48'36<br>h 47'32 | h 47'32<br>h 48'32            | h 48'64<br>h 47'58 | h 47'60<br>h 48'14 | h 48'14<br>h 45'64 | M = 47''·62<br>w = 24·40<br>$\frac{1}{w}$ = 0·04<br>C = 74° 16' 47''·62 |
|               | 46'91                                        | 47'50              | 47'98              | 48'15              | 47'17              | 47'84              | 47'82                         | 48'11              | 47'87              | 46'89              |                                                                         |

## At LXXI—(Continued.)

December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle<br>between                                                                            | Circle readings, telescope being set on LXIX  |            |            |            |            |            |            |            |            |            | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle        |
|---------------------------------------------------------------------------------------------|-----------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------------------------------------------------------------------------|
|                                                                                             | 73° 17'                                       | 253° 17'   | 80° 28'    | 260° 28'   | 87° 40'    | 267° 40'   | 94° 52'    | 274° 52'   | 102° 4'    | 282° 4'    |                                                                               |
| LXX &<br>LXXII                                                                              | "                                             | "          | "          | "          | "          | "          | "          | "          | "          | "          | $M$ = 20'' 35<br>$w$ = 12 95<br>$\frac{1}{w}$ = 0 08<br>$C$ = 42° 46' 20'' 35 |
|                                                                                             | $h$ 23' 28                                    | $h$ 20' 08 | $h$ 17' 60 | $h$ 20' 62 | $h$ 20' 50 | $h$ 20' 10 | $h$ 17' 84 | $h$ 19' 84 | $h$ 20' 54 | $h$ 19' 52 |                                                                               |
|                                                                                             | $h$ 20' 80                                    | $h$ 20' 24 | $h$ 19' 60 | $h$ 20' 48 | $h$ 20' 38 | $h$ 20' 28 | $h$ 20' 42 | $h$ 20' 06 | $h$ 20' 58 | $h$ 21' 58 |                                                                               |
|                                                                                             | $h$ 21' 28                                    |            | $h$ 20' 86 |            |            |            | $h$ 21' 64 |            |            |            |                                                                               |
|                                                                                             | 21' 79                                        | 20' 16     | 19' 35     | 20' 55     | 20' 44     | 20' 19     | 19' 97     | 19' 95     | 20' 56     | 20' 55     |                                                                               |
| LXXII &<br>LXXIII                                                                           | $h$ 3' 12                                     | $h$ 4' 74  | $h$ 6' 04  | $h$ 3' 22  | $h$ 2' 68  | $h$ 2' 40  | $h$ 5' 74  | $h$ 3' 76  | $h$ 4' 30  | $h$ 5' 36  | $M$ = 3'' 88<br>$w$ = 9 46<br>$\frac{1}{w}$ = 0 11<br>$C$ = 37° 5' 3'' 88     |
|                                                                                             | $h$ 4' 94                                     | $h$ 5' 40  | $h$ 2' 76  | $h$ 3' 46  | $h$ 2' 74  | $h$ 3' 54  | $h$ 3' 48  | $h$ 3' 36  | $h$ 4' 76  | $h$ 4' 72  |                                                                               |
|                                                                                             |                                               |            | $h$ 1' 64  |            |            |            | $h$ 3' 08  |            |            |            |                                                                               |
|                                                                                             | 4' 03                                         | 5' 07      | 3' 48      | 3' 34      | 2' 71      | 2' 97      | 4' 10      | 3' 56      | 4' 53      | 5' 04      |                                                                               |
| At LXXII                                                                                    |                                               |            |            |            |            |            |            |            |            |            |                                                                               |
| December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                               |            |            |            |            |            |            |            |            |            |                                                                               |
| Angle<br>between                                                                            | Circle readings, telescope being set on LXXIV |            |            |            |            |            |            |            |            |            | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle        |
|                                                                                             | 0° 1'                                         | 180° 1'    | 7° 12'     | 187° 12'   | 14° 24'    | 194° 24'   | 21° 36'    | 201° 36'   | 28° 48'    | 208° 48'   |                                                                               |
| LXXIV &<br>LXXV                                                                             | "                                             | "          | "          | "          | "          | "          | "          | "          | "          | "          | $M$ = 50'' 47<br>$w$ = 17 60<br>$\frac{1}{w}$ = 0 06<br>$C$ = 47° 27' 50'' 46 |
|                                                                                             | $h$ 51' 54                                    | $h$ 50' 40 | $h$ 49' 22 | $h$ 49' 92 | $h$ 50' 86 | $l$ 51' 26 | $l$ 50' 94 | $l$ 49' 16 | $l$ 48' 18 | $l$ 50' 52 |                                                                               |
|                                                                                             | $h$ 50' 96                                    | $h$ 50' 80 | $h$ 49' 62 | $h$ 50' 82 | $h$ 51' 34 | $l$ 50' 22 | $l$ 50' 82 | $l$ 50' 52 | $l$ 51' 00 | $l$ 51' 44 |                                                                               |
|                                                                                             |                                               |            | $h$ 49' 76 |            |            |            |            |            | $l$ 50' 00 |            |                                                                               |
|                                                                                             | 51' 25                                        | 50' 60     | 49' 42     | 50' 17     | 51' 10     | 50' 74     | 50' 88     | 49' 84     | 49' 73     | 50' 98     |                                                                               |
| LXXV &<br>LXXIII                                                                            | $h$ 5' 00                                     | $h$ 6' 38  | $h$ 7' 52  | $h$ 6' 30  | $h$ 5' 42  | $l$ 4' 36  | $l$ 5' 60  | $l$ 5' 06  | $l$ 5' 74  | $l$ 5' 06  | $M$ = 5'' 81<br>$w$ = 13 50<br>$\frac{1}{w}$ = 0 07<br>$C$ = 51° 16' 5'' 81   |
|                                                                                             | $h$ 5' 54                                     | $h$ 5' 82  | $h$ 8' 02  | $h$ 6' 38  | $h$ 6' 06  | $l$ 5' 74  | $l$ 6' 12  | $l$ 4' 98  | $l$ 5' 96  | $l$ 5' 10  |                                                                               |
|                                                                                             | 5' 27                                         | 6' 10      | 7' 77      | 6' 34      | 5' 74      | 5' 05      | 5' 86      | 5' 02      | 5' 85      | 5' 08      |                                                                               |

| At LXXII—(Continued.)                                                                              |                                               |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                        |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                        |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXXIV |                    |                    |                    |                    |                    |                    |                    |                    |                    | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                                 |
|                                                                                                    | 0° 1'                                         | 180° 1'            | 7° 12'             | 187° 12'           | 14° 24'            | 194° 24'           | 21° 36'            | 201° 36'           | 28° 48'            | 208° 48'           |                                                                                                        |
| LXXIII<br>& LXXI                                                                                   | "                                             | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | $M = 45''\cdot 24$<br>$w = 7\cdot 40$<br>$\frac{1}{w} = 0\cdot 14$<br>$C = 59^\circ 2' 45''\cdot 24$   |
|                                                                                                    | $h 47^{\circ} 62'$                            | $h 45^{\circ} 54'$ | $h 44^{\circ} 96'$ | $h 45^{\circ} 48'$ | $h 45^{\circ} 44'$ | $l 44^{\circ} 92'$ | $l 44^{\circ} 72'$ | $l 43^{\circ} 12'$ | $l 45^{\circ} 50'$ | $l 45^{\circ} 24'$ |                                                                                                        |
|                                                                                                    | $h 47^{\circ} 98'$                            | $h 46^{\circ} 36'$ | $h 44^{\circ} 60'$ | $h 44^{\circ} 76'$ | $h 44^{\circ} 90'$ | $l 45^{\circ} 30'$ | $l 43^{\circ} 20'$ | $l 44^{\circ} 54'$ | $l 44^{\circ} 50'$ | $l 46^{\circ} 02'$ |                                                                                                        |
|                                                                                                    | 47° 80                                        | 45° 95             | 44° 78             | 45° 12             | 45° 17             | 45° 11             | 43° 96             | 43° 83             | 45° 00             | 45° 63             |                                                                                                        |
| LXXI &<br>LXX                                                                                      | $h 3^{\circ} 06'$                             | $h 3^{\circ} 00'$  | $h 2^{\circ} 48'$  | $h 3^{\circ} 54'$  | $h 3^{\circ} 98'$  | $l 3^{\circ} 76'$  | $l 5^{\circ} 78'$  | $l 6^{\circ} 10'$  | $l 3^{\circ} 76'$  | $l 3^{\circ} 74'$  | $M = 3''\cdot 58$<br>$w = 7\cdot 83$<br>$\frac{1}{w} = 0\cdot 13$<br>$C = 31^\circ 14' 3''\cdot 58$    |
|                                                                                                    | $h 2^{\circ} 26'$                             | $h 2^{\circ} 44'$  | $h 3^{\circ} 18'$  | $h 2^{\circ} 98'$  | $h 3^{\circ} 20'$  | $l 2^{\circ} 86'$  | $l 5^{\circ} 44'$  | $l 4^{\circ} 76'$  | $l 3^{\circ} 10'$  | $l 1^{\circ} 64'$  |                                                                                                        |
|                                                                                                    |                                               |                    |                    |                    |                    |                    |                    |                    |                    | $l 3^{\circ} 50'$  |                                                                                                        |
|                                                                                                    | 2° 66                                         | 2° 72              | 2° 83              | 3° 26              | 3° 59              | 3° 31              | 5° 61              | 5° 43              | 3° 43              | 2° 96              |                                                                                                        |
| At LXXIII                                                                                          |                                               |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                        |
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                        |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXXI  |                    |                    |                    |                    |                    |                    |                    |                    |                    | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                                 |
|                                                                                                    | 0° 1'                                         | 180° 1'            | 7° 12'             | 187° 12'           | 14° 24'            | 194° 24'           | 21° 36'            | 201° 36'           | 28° 48'            | 208° 48'           |                                                                                                        |
| LXXI &<br>LXX                                                                                      | "                                             | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | "                  | $M = 34''\cdot 84$<br>$w = 9\cdot 17$<br>$\frac{1}{w} = 0\cdot 11$<br>$C = 34^\circ 40' 34''\cdot 83$  |
|                                                                                                    | $h 33^{\circ} 96'$                            | $h 32^{\circ} 26'$ | $h 34^{\circ} 50'$ | $h 34^{\circ} 76'$ | $h 34^{\circ} 44'$ | $h 34^{\circ} 68'$ | $h 35^{\circ} 74'$ | $h 36^{\circ} 64'$ | $h 34^{\circ} 60'$ | $l 36^{\circ} 00'$ |                                                                                                        |
|                                                                                                    | $h 35^{\circ} 84'$                            | $h 34^{\circ} 20'$ | $h 34^{\circ} 26'$ | $h 32^{\circ} 52'$ | $h 33^{\circ} 82'$ | $h 35^{\circ} 38'$ | $h 36^{\circ} 44'$ | $h 35^{\circ} 30'$ | $l 34^{\circ} 68'$ | $l 35^{\circ} 68'$ |                                                                                                        |
|                                                                                                    | 34° 90                                        | 33° 23             | 34° 38             | 34° 14             | 34° 13             | 35° 03             | 36° 09             | 35° 97             | 34° 64             | 35° 84             |                                                                                                        |
| LXX &<br>LXXII                                                                                     | $h 38^{\circ} 84'$                            | $h 37^{\circ} 50'$ | $h 36^{\circ} 48'$ | $h 36^{\circ} 42'$ | $h 37^{\circ} 26'$ | $h 36^{\circ} 32'$ | $h 36^{\circ} 92'$ | $h 35^{\circ} 20'$ | $h 37^{\circ} 58'$ | $l 35^{\circ} 04'$ | $M = 37''\cdot 04$<br>$w = 11\cdot 60$<br>$\frac{1}{w} = 0\cdot 09$<br>$C = 49^\circ 11' 37''\cdot 04$ |
|                                                                                                    | $h 36^{\circ} 92'$                            | $h 37^{\circ} 86'$ | $h 38^{\circ} 24'$ | $h 37^{\circ} 34'$ | $h 37^{\circ} 50'$ | $h 36^{\circ} 70'$ | $h 36^{\circ} 50'$ | $h 36^{\circ} 68'$ | $l 38^{\circ} 92'$ | $l 36^{\circ} 48'$ |                                                                                                        |
|                                                                                                    |                                               |                    |                    |                    |                    |                    |                    |                    |                    |                    |                                                                                                        |
|                                                                                                    | 37° 88                                        | 37° 68             | 37° 36             | 36° 88             | 37° 38             | 36° 51             | 36° 71             | 35° 94             | 38° 25             | 35° 76             |                                                                                                        |



| <i>At LXXIII—(Continued.)</i>                                                                      |                                                |                |                |                |                |                |                |                |                |                |                                                                                              |
|----------------------------------------------------------------------------------------------------|------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                |                |                |                |                |                |                |                |                |                                                                                              |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXXI   |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 1'                                          | 180° 1'        | 7° 12'         | 187° 12'       | 14° 24'        | 194° 24'       | 21° 36'        | 201° 36'       | 28° 48'        | 208° 48'       |                                                                                              |
| LXXII &<br>LXXIV                                                                                   | "                                              | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 40''·44<br><i>w</i> = 20·63<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 40° 10' 40''·44 |
|                                                                                                    | <i>h</i> 40·78                                 | <i>h</i> 41·30 | <i>h</i> 41·56 | <i>h</i> 40·18 | <i>h</i> 41·18 | <i>h</i> 41·60 | <i>h</i> 39·06 | <i>h</i> 41·08 | <i>h</i> 40·26 | <i>l</i> 39·98 |                                                                                              |
|                                                                                                    | <i>h</i> 40·44                                 | <i>h</i> 39·26 | <i>h</i> 40·88 | <i>h</i> 40·96 | <i>h</i> 40·62 | <i>h</i> 40·94 | <i>h</i> 40·10 | <i>h</i> 40·02 | <i>l</i> 39·20 | <i>l</i> 39·90 |                                                                                              |
|                                                                                                    | <i>h</i> 39·66                                 |                |                |                |                |                |                |                |                |                |                                                                                              |
|                                                                                                    | 40·61                                          | 40·07          | 41·22          | 40·57          | 40·90          | 41·27          | 39·58          | 40·55          | 39·73          | 39·94          |                                                                                              |
| LXXIV &<br>LXXV                                                                                    | <i>h</i> 50·80                                 | <i>h</i> 47·72 | <i>h</i> 48·90 | <i>h</i> 49·24 | <i>h</i> 48·04 | <i>h</i> 46·22 | <i>h</i> 48·96 | <i>h</i> 47·20 | <i>h</i> 48·80 | <i>l</i> 50·02 | <i>M</i> = 48''·76<br><i>w</i> = 8·00<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 27° 24' 48''·76  |
|                                                                                                    | <i>h</i> 50·12                                 | <i>h</i> 49·34 | <i>h</i> 49·76 | <i>h</i> 49·08 | <i>h</i> 47·92 | <i>h</i> 48·14 | <i>h</i> 48·64 | <i>h</i> 47·16 | <i>l</i> 49·66 | <i>l</i> 49·46 |                                                                                              |
|                                                                                                    | 50·46                                          | 48·53          | 49·33          | 49·16          | 47·98          | 47·18          | 48·80          | 47·18          | 49·23          | 49·74          |                                                                                              |
| <i>At LXXIV</i>                                                                                    |                                                |                |                |                |                |                |                |                |                |                |                                                                                              |
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                |                |                |                |                |                |                |                |                |                                                                                              |
| Angle<br>between                                                                                   | Circle readings, telescope being set on LXXVII |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                    | 0° 2'                                          | 180° 1'        | 7° 12'         | 187° 12'       | 14° 25'        | 194° 25'       | 21° 36'        | 201° 37'       | 28° 48'        | 208° 48'       |                                                                                              |
| LXXVII<br>& LXXVI                                                                                  | "                                              | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 7''·43<br><i>w</i> = 12·38<br>$\frac{1}{w}$ = 0·08<br><i>C</i> = 72° 34' 7''·46   |
|                                                                                                    | <i>h</i> 6·32                                  | <i>h</i> 7·42  | <i>h</i> 8·32  | <i>h</i> 7·30  | <i>h</i> 7·68  | <i>h</i> 8·26  | <i>l</i> 8·16  | <i>l</i> 6·98  | <i>l</i> 10·16 | <i>l</i> 5·58  |                                                                                              |
|                                                                                                    | <i>h</i> 8·48                                  | <i>h</i> 7·22  | <i>h</i> 6·86  | <i>h</i> 7·78  | <i>h</i> 7·48  | <i>h</i> 7·06  | <i>l</i> 6·24  | <i>l</i> 7·02  | <i>l</i> 6·22  | <i>l</i> 6·82  |                                                                                              |
|                                                                                                    | <i>h</i> 7·24                                  |                |                |                |                |                |                |                | <i>l</i> 10·10 |                |                                                                                              |
|                                                                                                    | 7·35                                           | 7·32           | 7·59           | 7·54           | 7·58           | 7·66           | 7·20           | 7·00           | 8·83           | 6·20           |                                                                                              |
| LXXVI &<br>LXXV                                                                                    | <i>h</i> 43·34                                 | <i>h</i> 43·36 | <i>h</i> 42·02 | <i>h</i> 42·60 | <i>h</i> 42·28 | <i>h</i> 40·62 | <i>l</i> 42·22 | <i>l</i> 41·60 | <i>l</i> 37·10 | <i>l</i> 40·58 | <i>M</i> = 41''·83<br><i>w</i> = 8·02<br>$\frac{1}{w}$ = 0·12<br><i>C</i> = 73° 45' 41''·80  |
|                                                                                                    | <i>h</i> 41·78                                 | <i>h</i> 41·84 | <i>h</i> 42·70 | <i>h</i> 42·60 | <i>h</i> 41·62 | <i>h</i> 41·68 | <i>l</i> 41·80 | <i>l</i> 42·08 | <i>l</i> 42·48 | <i>l</i> 42·40 |                                                                                              |
|                                                                                                    |                                                |                |                |                |                |                |                |                | <i>l</i> 39·68 |                |                                                                                              |
|                                                                                                    | 42·56                                          | 42·60          | 42·36          | 42·60          | 41·95          | 41·15          | 42·01          | 41·84          | 39·75          | 41·49          |                                                                                              |
| LXXV &<br>LXXIII                                                                                   | <i>h</i> 48·62                                 | <i>h</i> 50·12 | <i>h</i> 48·30 | <i>h</i> 50·28 | <i>h</i> 48·88 | <i>h</i> 51·64 | <i>l</i> 49·38 | <i>l</i> 47·78 | <i>l</i> 50·24 | <i>l</i> 50·16 | <i>M</i> = 49''·34<br><i>w</i> = 11·10<br>$\frac{1}{w}$ = 0·09<br><i>C</i> = 26° 33' 49''·34 |
|                                                                                                    | <i>h</i> 48·66                                 | <i>h</i> 48·80 | <i>h</i> 48·40 | <i>h</i> 48·76 | <i>h</i> 50·46 | <i>h</i> 50·66 | <i>l</i> 47·86 | <i>l</i> 49·78 | <i>l</i> 48·48 | <i>l</i> 49·54 |                                                                                              |
|                                                                                                    | 48·64                                          | 49·46          | 48·35          | 49·52          | 49·67          | 51·15          | 48·62          | 48·78          | 49·36          | 49·85          |                                                                                              |

| At LXXIV—(Continued.)                                                                       |                                                |          |         |          |         |          |         |          |         |          |                                                                  |
|---------------------------------------------------------------------------------------------|------------------------------------------------|----------|---------|----------|---------|----------|---------|----------|---------|----------|------------------------------------------------------------------|
| December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                                |          |         |          |         |          |         |          |         |          |                                                                  |
| Angle between                                                                               | Circle readings, telescope being set on LXXVII |          |         |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                             | 0° 2'                                          | 180° 1'  | 7° 12'  | 187° 12' | 14° 25' | 194° 25' | 21° 36' | 201° 37' | 28° 48' | 208° 48' |                                                                  |
| LXXIII & LXXII                                                                              | "                                              | "        | "       | "        | "       | "        | "       | "        | "       | "        | M = 24''·44                                                      |
|                                                                                             | h22°58                                         | h25°38   | h23°84  | h22°92   | h24°92  | h23°40   | l24°24  | l25°42   | l27°00  | l25°28   | w = 8·67                                                         |
|                                                                                             | h23°08                                         | h24°06   | h23°72  | h25°04   | h23°60  | h23°78   | l26°92  | l23°60   | l23°96  | l24°84   | $\frac{1}{w} = 0\cdot12$                                         |
|                                                                                             |                                                |          | h24°98  |          |         |          | l26°58  |          | l25°38  |          | $\frac{1}{w} = 0\cdot12$                                         |
|                                                                                             | 22°83                                          | 24°72    | 23°78   | 24°31    | 24°26   | 23°59    | 25°91   | 24°51    | 25°45   | 25°06    | C = 35° 5' 24''·46                                               |
| At LXXV                                                                                     |                                                |          |         |          |         |          |         |          |         |          |                                                                  |
| December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite. |                                                |          |         |          |         |          |         |          |         |          |                                                                  |
| Angle between                                                                               | Circle readings, telescope being set on LXXIII |          |         |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                             | 70° 16'                                        | 250° 16' | 77° 27' | 257° 27' | 84° 39' | 264° 39' | 91° 51' | 271° 51' | 99° 3'  | 279° 3'  |                                                                  |
| LXXIII & LXXII                                                                              | "                                              | "        | "       | "        | "       | "        | "       | "        | "       | "        | M = 24''·99                                                      |
|                                                                                             | h25°34                                         | h23°86   | h26°86  | h25°08   | h27°22  | h26°80   | h23°66  | h25°86   | l25°40  | l25°20   | w = 9·08                                                         |
|                                                                                             | h25°78                                         | h23°30   | h25°98  | h24°30   | h24°34  | h25°40   | h24°16  | h23°68   | l24°98  | l23°54   | $\frac{1}{w} = 0\cdot11$                                         |
|                                                                                             |                                                |          |         | h24°48   |         |          |         |          |         |          | $\frac{1}{w} = 0\cdot11$                                         |
|                                                                                             | 25°56                                          | 23°58    | 26°42   | 24°69    | 25°35   | 26°10    | 23°91   | 24°77    | 25°19   | 24°37    | C = 55° 8' 24''·99                                               |
| LXXII & LXXIV                                                                               | h57°60                                         | h58°60   | h54°52  | h56°44   | h54°08  | h55°02   | h58°00  | h58°30   | l57°52  | l59°04   | M = 57''·c7                                                      |
|                                                                                             | h57°16                                         | h57°52   | h56°02  | h55°64   | h55°86  | h56°26   | h57°06  | h57°74   | l59°48  | l58°92   | w = 4·71                                                         |
|                                                                                             |                                                |          |         |          | h55°88  |          |         |          |         |          | $\frac{1}{w} = 0\cdot21$                                         |
|                                                                                             | 57°38                                          | 58°06    | 55°27   | 56°04    | 55°27   | 55°64    | 57°53   | 58°02    | 58°50   | 58°98    | C = 70° 52' 57''·07                                              |
| LXXIV & LXXVI                                                                               | h39°78                                         | h37°96   | h41°36  | h40°84   | h35°98  | h37°80   | h40°00  | h38°68   | l40°60  | l41°46   | M = 39''·67                                                      |
|                                                                                             | h38°90                                         | h38°56   | h40°74  | h40°78   | h41°94  | h38°60   | h39°30  | h40°36   | l39°32  | l39°98   | w = 6·59                                                         |
|                                                                                             |                                                |          |         |          | h39°76  |          |         |          |         |          | $\frac{1}{w} = 0\cdot15$                                         |
|                                                                                             | 39°34                                          | 38°26    | 41°05   | 40°81    | 39°23   | 38°20    | 39°65   | 39°52    | 39°96   | 40°72    | C = 45° 4' 39''·66                                               |
| LXXVI & LXXVIII                                                                             | h46°96                                         | h48°24   | h47°80  | h48°44   | h51°32  | h50°02   | h48°50  | h48°40   | l47°56  | l46°72   | M = 48''·77                                                      |
|                                                                                             | h47°96                                         | h50°42   | h48°26  | h48°86   | h50°92  | h49°68   | h48°98  | h49°14   | l47°82  | l48°46   | w = 6·42                                                         |
|                                                                                             |                                                | h50°80   |         |          |         |          |         |          |         |          | $\frac{1}{w} = 0\cdot16$                                         |
|                                                                                             | 47°46                                          | 49°82    | 48°03   | 48°65    | 51°12   | 49°85    | 48°74   | 48°77    | 47°69   | 47°59    | C = 46° 47' 48''·77                                              |

| At LXXVI                                                                                                   |                                              |          |          |          |          |          |          |          |          |          |                                                                                            |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------------------------------------------------------------------------------|
| January 1852, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite. |                                              |          |          |          |          |          |          |          |          |          |                                                                                            |
| Angle between                                                                                              | Circle readings, telescope being set on LXXV |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                            | 0° 1'                                        | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                                            |
| LXXV & LXXIV                                                                                               | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 38".75<br><i>w</i> = 9.07<br>$\frac{1}{w}$ = 0.11<br><i>C</i> = 61° 9' 38".75   |
|                                                                                                            | l 39° 68                                     | l 37° 90 | l 37° 10 | l 37° 82 | h 37° 92 | h 38° 58 | h 40° 10 | h 39° 78 | l 40° 32 | l 40° 74 |                                                                                            |
|                                                                                                            | l 38° 54                                     | l 37° 52 | l 37° 24 | l 38° 06 | h 38° 38 | h 39° 32 | h 37° 34 | h 37° 94 | l 38° 94 | l 39° 92 |                                                                                            |
|                                                                                                            |                                              |          |          |          |          | h 40° 22 |          |          |          |          |                                                                                            |
|                                                                                                            | 39° 11                                       | 37° 71   | 37° 17   | 38° 39   | 38° 15   | 38° 95   | 39° 22   | 38° 86   | 39° 63   | 40° 33   |                                                                                            |
| LXXIV & LXXVII                                                                                             | h 9° 94                                      | h 10° 50 | l 11° 16 | l 9° 60  | h 10° 32 | h 10° 02 | h 10° 20 | h 9° 82  | l 8° 80  | l 9° 98  | <i>M</i> = 10".08<br><i>w</i> = 13.00<br>$\frac{1}{w}$ = 0.08<br><i>C</i> = 52° 46' 10".08 |
|                                                                                                            | h 11° 62                                     | l 8° 82  | l 9° 28  | l 11° 44 | h 10° 54 | h 8° 92  | h 10° 70 | h 11° 66 | l 8° 00  | l 10° 30 |                                                                                            |
|                                                                                                            | 10° 78                                       | 9° 66    | 10° 22   | 10° 52   | 10° 43   | 9° 47    | 10° 45   | 10° 74   | 8° 40    | 10° 14   |                                                                                            |
| LXXVII & LXXXIX                                                                                            | h 45° 16                                     | h 45° 28 | l 43° 50 | l 45° 94 | h 43° 14 | h 43° 80 | h 42° 96 | h 44° 00 | l 46° 46 | l 43° 24 | <i>M</i> = 44".21<br><i>w</i> = 7.60<br>$\frac{1}{w}$ = 0.13<br><i>C</i> = 68° 37' 44".21  |
|                                                                                                            | h 44° 52                                     | l 45° 30 | l 44° 18 | l 44° 32 | h 42° 96 | h 43° 42 | h 42° 66 | h 43° 88 | l 46° 06 | l 43° 42 |                                                                                            |
|                                                                                                            | 44° 84                                       | 45° 29   | 43° 84   | 45° 13   | 43° 05   | 43° 61   | 42° 81   | 43° 94   | 46° 26   | 43° 33   |                                                                                            |
| LXXXIX & LXXX                                                                                              | h 41° 86                                     | h 40° 04 | l 41° 92 | l 37° 84 | h 43° 50 | h 41° 70 | h 43° 28 | h 42° 34 | l 41° 40 | l 41° 84 | <i>M</i> = 41".88<br><i>w</i> = 4.00<br>$\frac{1}{w}$ = 0.25<br><i>C</i> = 49° 57' 41".88  |
|                                                                                                            | h 42° 84                                     | l 41° 84 | l 41° 94 | l 38° 54 | h 43° 26 | h 43° 52 | h 44° 24 | h 41° 12 | l 42° 00 | l 42° 52 |                                                                                            |
|                                                                                                            | 42° 35                                       | 40° 94   | 41° 93   | 38° 19   | 43° 38   | 42° 61   | 43° 76   | 41° 73   | 41° 70   | 42° 18   |                                                                                            |
| LXXX & LXXXVIII                                                                                            | h 52° 58                                     | h 54° 60 | l 54° 30 | l 56° 86 | h 53° 44 | h 54° 94 | h 52° 64 | h 54° 02 | l 51° 68 | l 53° 16 | <i>M</i> = 53".70<br><i>w</i> = 3.70<br>$\frac{1}{w}$ = 0.27<br><i>C</i> = 39° 13' 53".70  |
|                                                                                                            | h 51° 90                                     | h 54° 74 | l 55° 02 | l 56° 58 | h 53° 50 | h 55° 20 | h 51° 18 | h 54° 02 | l 51° 98 | l 51° 72 |                                                                                            |
|                                                                                                            | 52° 24                                       | 54° 67   | 54° 66   | 56° 72   | 53° 47   | 55° 07   | 51° 91   | 54° 02   | 51° 83   | 52° 44   |                                                                                            |
| LXXXVIII & LXXV                                                                                            | l 51° 38                                     | l 50° 24 | l 53° 16 | l 48° 38 | h 51° 34 | h 50° 48 | h 51° 44 | h 50° 66 | l 51° 84 | l 51° 14 | <i>M</i> = 51".31<br><i>w</i> = 5.70<br>$\frac{1}{w}$ = 0.18<br><i>C</i> = 88° 14' 51".31  |
|                                                                                                            | l 52° 50                                     | l 51° 54 | l 54° 80 | l 50° 10 | h 50° 48 | h 49° 96 | h 52° 04 | h 51° 38 | l 52° 44 | l 50° 84 |                                                                                            |
|                                                                                                            | 51° 94                                       | 50° 89   | 53° 98   | 49° 24   | 50° 91   | 50° 22   | 51° 74   | 51° 02   | 52° 14   | 50° 99   |                                                                                            |

| At LXXVII                                                                                          |                                               |           |           |           |           |           |           |           |           |           |                                                                                                |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------------------------------------------------------------------------|
| <i>December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |           |           |           |           |           |           |           |           |           |                                                                                                |
| Angle between                                                                                      | Circle readings, telescope being set on LXXIX |           |           |           |           |           |           |           |           |           | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle          |
|                                                                                                    | 0° 1'                                         | 180° 1'   | 7° 12'    | 187° 12'  | 14° 24'   | 194° 24'  | 21° 36'   | 201° 36'  | 28° 48'   | 208° 48'  |                                                                                                |
| LXXIX & LXXVI                                                                                      | "                                             | "         | "         | "         | "         | "         | "         | "         | "         | "         | <i>M</i> = 9''·77<br><i>w</i> = 12 ·00<br>$\frac{1}{w}$ = 0 ·08<br><i>C</i> = 76° 58' 9''·77   |
|                                                                                                    | h 8° 10'                                      | h 9° 8'   | h 7° 90'  | h 9° 06'  | h 10° 46' | h 10° 74' | h 10° 10' | h 10° 20' | h 10° 34' | h 10° 46' |                                                                                                |
|                                                                                                    | h 9° 32'                                      | h 9° 24'  | h 8° 52'  | h 9° 08'  | h 9° 74'  | h 11° 32' | h 10° 82' | h 9° 70'  | h 9° 94'  | h 10° 46' |                                                                                                |
|                                                                                                    | 8° 71'                                        | 9° 55'    | 8° 21'    | 9° 07'    | 10° 10'   | 11° 03'   | 10° 46'   | 9° 95'    | 10° 14'   | 10° 46'   |                                                                                                |
| LXXVI & LXXIV                                                                                      | h 43° 46'                                     | h 41° 68' | h 43° 10' | h 42° 94' | h 41° 56' | h 43° 06' | h 43° 08' | h 42° 70' | h 40° 44' | h 42° 68' | <i>M</i> = 42''·31<br><i>w</i> = 22 ·20<br>$\frac{1}{w}$ = 0 ·05<br><i>C</i> = 54° 39' 42''·31 |
|                                                                                                    | h 41° 46'                                     | h 41° 72' | h 42° 36' | h 42° 60' | h 42° 08' | h 42° 32' | h 41° 56' | h 42° 90' | h 41° 86' | h 42° 68' |                                                                                                |
|                                                                                                    | 42° 46'                                       | 41° 70'   | 42° 73'   | 42° 77'   | 41° 82'   | 42° 69'   | 42° 32'   | 42° 80'   | 41° 15'   | 42° 68'   |                                                                                                |
| At LXXVIII                                                                                         |                                               |           |           |           |           |           |           |           |           |           |                                                                                                |
| <i>January 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>  |                                               |           |           |           |           |           |           |           |           |           |                                                                                                |
| Angle between                                                                                      | Circle readings, telescope being set on LXXV  |           |           |           |           |           |           |           |           |           | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle          |
|                                                                                                    | 0° 1'                                         | 180° 1'   | 7° 12'    | 187° 12'  | 14° 25'   | 194° 25'  | 21° 36'   | 201° 36'  | 28° 48'   | 208° 48'  |                                                                                                |
| LXXV & LXXVI                                                                                       | "                                             | "         | "         | "         | "         | "         | "         | "         | "         | "         | <i>M</i> = 21''·71<br><i>w</i> = 16 ·90<br>$\frac{1}{w}$ = 0 ·06<br><i>C</i> = 44° 57' 21''·71 |
|                                                                                                    | h 20° 86'                                     | h 21° 06' | h 21° 92' | h 21° 54' | h 21° 64' | h 22° 32' | h 21° 40' | h 20° 22' | h 21° 98' | h 22° 10' |                                                                                                |
|                                                                                                    | h 21° 88'                                     | h 21° 98' | h 21° 26' | h 22° 92' | h 21° 64' | h 23° 28' | h 22° 22' | h 20° 06' | h 21° 24' | h 22° 60' |                                                                                                |
|                                                                                                    | 21° 37'                                       | 21° 52'   | 21° 59'   | 22° 23'   | 21° 64'   | 22° 80'   | 21° 81'   | 20° 14'   | 21° 61'   | 22° 35'   |                                                                                                |
| LXXVI & LXXX                                                                                       | h 53° 12'                                     | h 53° 00' | h 52° 26' | h 53° 60' | h 52° 98' | h 53° 42' | h 54° 06' | h 54° 54' | h 53° 48' | h 53° 56' | <i>M</i> = 53''·24<br><i>w</i> = 23 ·80<br>$\frac{1}{w}$ = 0 ·04<br><i>C</i> = 81° 16' 53''·24 |
|                                                                                                    | h 52° 74'                                     | h 52° 14' | h 52° 64' | h 52° 20' | h 53° 38' | h 53° 22' | h 54° 04' | h 54° 04' | h 53° 76' | h 52° 54' |                                                                                                |
|                                                                                                    | 52° 93'                                       | 52° 57'   | 52° 45'   | 52° 90'   | 53° 18'   | 53° 32'   | 54° 05'   | 54° 29'   | 53° 62'   | 53° 05'   |                                                                                                |

| <i>At LXXIX</i>                                                                                                   |                                                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------------------------------------------------------|
| <i>January 1852, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| Angle between                                                                                                     | Circle readings, telescope being set on LXXXII  |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                                   | 0° 1'                                           | 180° 1'         | 7° 12'          | 187° 12'        | 14° 24'         | 194° 24'        | 21° 36'         | 201° 37'        | 28° 48'         | 208° 48'        |                                                                                       |
| LXXXII & LXXXI                                                                                                    | "                                               | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 1''·49                                                                     |
|                                                                                                                   | <i>h</i> 0'·14                                  | <i>h</i> 0'·98  | <i>h</i> 1'·76  | <i>h</i> 2'·34  | <i>h</i> 1'·58  | <i>h</i> 1'·88  | <i>l</i> 2'·24  | <i>l</i> 2'·12  | <i>l</i> 1'·24  | <i>l</i> 1'·72  | <i>w</i> = 24·40                                                                      |
|                                                                                                                   | <i>h</i> 1'·68                                  | <i>h</i> 1'·18  | <i>h</i> 1'·18  | <i>h</i> 0'·78  | <i>h</i> 0'·58  | <i>h</i> 2'·62  | <i>l</i> 1'·88  | <i>l</i> 2'·50  | <i>l</i> 0'·36  | <i>l</i> 1'·06  | $\frac{1}{w}$ = 0·04                                                                  |
|                                                                                                                   | 0'·91                                           | 1'·08           | 1'·47           | 1'·56           | 1'·08           | 2'·25           | 2'·06           | 2'·31           | 0'·80           | 1'·39           | <i>C</i> = 47° 1' 1''·49                                                              |
| LXXXI & LXXX                                                                                                      | <i>h</i> 55'·20                                 | <i>h</i> 54'·70 | <i>h</i> 54'·04 | <i>h</i> 53'·60 | <i>h</i> 54'·06 | <i>h</i> 55'·18 | <i>l</i> 54'·58 | <i>l</i> 53'·68 | <i>l</i> 53'·86 | <i>l</i> 53'·50 | <i>M</i> = 54''·12                                                                    |
|                                                                                                                   | <i>h</i> 53'·14                                 | <i>h</i> 53'·98 | <i>h</i> 54'·66 | <i>h</i> 56'·24 | <i>h</i> 56'·16 | <i>h</i> 53'·88 | <i>l</i> 54'·18 | <i>l</i> 52'·82 | <i>l</i> 54'·08 | <i>l</i> 52'·76 | <i>w</i> = 15·80                                                                      |
|                                                                                                                   |                                                 |                 |                 | <i>h</i> 52'·34 | <i>h</i> 54'·84 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0·06                                                                  |
|                                                                                                                   | 54'·17                                          | 54'·34          | 54'·35          | 54'·06          | 55'·02          | 54'·53          | 54'·38          | 53'·25          | 53'·97          | 53'·13          | <i>C</i> = 68° 58' 54''·14                                                            |
| LXXX & LXXVI                                                                                                      | <i>h</i> 19'·84                                 | <i>h</i> 19'·42 | <i>h</i> 18'·86 | <i>h</i> 18'·86 | <i>h</i> 20'·76 | <i>h</i> 18'·84 | <i>l</i> 18'·52 | <i>l</i> 18'·92 | <i>l</i> 19'·86 | <i>l</i> 18'·62 | <i>M</i> = 19''·18                                                                    |
|                                                                                                                   | <i>h</i> 20'·00                                 | <i>h</i> 19'·50 | <i>h</i> 17'·90 | <i>l</i> 17'·86 | <i>h</i> 18'·68 | <i>h</i> 19'·70 | <i>l</i> 19'·20 | <i>l</i> 19'·04 | <i>l</i> 19'·94 | <i>l</i> 19'·38 | <i>w</i> = 23·98                                                                      |
|                                                                                                                   |                                                 |                 |                 |                 | <i>h</i> 19'·58 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0·04                                                                  |
|                                                                                                                   | 19'·92                                          | 19'·46          | 18'·38          | 18'·36          | 19'·67          | 19'·27          | 18'·86          | 18'·98          | 19'·90          | 19'·00          | <i>C</i> = 51° 18' 19''·18                                                            |
| LXXVI & LXXVII                                                                                                    | <i>h</i> 6'·94                                  | <i>h</i> 7'·76  | <i>h</i> 7'·12  | <i>h</i> 7'·68  | <i>h</i> 6'·48  | <i>h</i> 7'·94  | <i>l</i> 6'·18  | <i>l</i> 5'·18  | <i>l</i> 6'·92  | <i>l</i> 6'·54  | <i>M</i> = 7''·19                                                                     |
|                                                                                                                   | <i>h</i> 7'·98                                  | <i>h</i> 7'·94  | <i>h</i> 7'·84  | <i>l</i> 7'·52  | <i>h</i> 8'·96  | <i>h</i> 8'·88  | <i>l</i> 7'·14  | <i>l</i> 6'·42  | <i>l</i> 6'·70  | <i>l</i> 6'·14  | <i>w</i> = 13·31                                                                      |
|                                                                                                                   |                                                 |                 |                 |                 | <i>h</i> 6'·90  |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0·08                                                                  |
|                                                                                                                   | 7'·46                                           | 7'·85           | 7'·48           | 7'·60           | 7'·45           | 8'·41           | 6'·66           | 5'·80           | 6'·81           | 6'·34           | <i>C</i> = 34° 24' 7''·19                                                             |
| <i>At LXXX</i>                                                                                                    |                                                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| <i>January 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                 |                                                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| Angle between                                                                                                     | Circle readings, telescope being set on LXXVIII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                                   | 38° 25'                                         | 218° 25'        | 45° 36'         | 225° 36'        | 52° 48'         | 232° 48'        | 60° 0'          | 240° 0'         | 67° 13'         | 247° 13'        |                                                                                       |
| LXXVIII & LXXVI                                                                                                   | "                                               | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 14''·28                                                                    |
|                                                                                                                   | <i>h</i> 14'·54                                 | <i>h</i> 14'·40 | <i>h</i> 15'·66 | <i>h</i> 12'·38 | <i>h</i> 16'·34 | <i>h</i> 14'·90 | <i>h</i> 14'·14 | <i>l</i> 16'·74 | <i>l</i> 14'·90 | <i>l</i> 12'·22 | <i>w</i> = 8·39                                                                       |
|                                                                                                                   | <i>h</i> 13'·20                                 | <i>h</i> 15'·18 | <i>h</i> 14'·44 | <i>h</i> 13'·44 | <i>h</i> 14'·34 | <i>h</i> 14'·36 | <i>h</i> 14'·36 | <i>l</i> 13'·32 | <i>l</i> 15'·18 | <i>l</i> 12'·80 | $\frac{1}{w}$ = 0·12                                                                  |
|                                                                                                                   | 13'·87                                          | 14'·79          | 15'·05          | 12'·91          | 15'·34          | 14'·63          | 14'·25          | 14'·37          | 15'·04          | 12'·51          | <i>C</i> = 59° 29' 14''·28                                                            |

| At LXXX—(Continued.)                                                                                              |                                                 |          |          |          |          |          |          |          |          |          |                                                                                              |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------------------------------|
| <i>January 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                 |                                                 |          |          |          |          |          |          |          |          |          |                                                                                              |
| Angle between                                                                                                     | Circle readings, telescope being set on LXXVIII |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                   | 38° 25'                                         | 218° 25' | 45° 36'  | 225° 36' | 52° 49'  | 232° 49' | 60° 0'   | 240° 0'  | 67° 13'  | 247° 13' |                                                                                              |
| LXXVI & LXXIX                                                                                                     | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 59'' 52<br><i>w</i> = 12 06<br>$\frac{1}{w}$ = 0 08<br><i>C</i> = 78° 43' 59'' 53 |
|                                                                                                                   | h 59° 32                                        | h 59° 84 | h 59° 14 | h 59° 66 | h 59° 50 | h 59° 88 | h 60° 38 | l 57° 40 | l 61° 00 | l 60° 96 |                                                                                              |
|                                                                                                                   | h 60° 46                                        | h 58° 38 | h 58° 44 | h 59° 28 | h 57° 08 | h 59° 16 | h 59° 28 | l 61° 06 | l 58° 54 | l 60° 32 |                                                                                              |
|                                                                                                                   | 59° 89                                          | 59° 11   | 58° 79   | 59° 47   | 58° 29   | 59° 52   | 59° 83   | 59° 84   | 59° 81   | 60° 64   |                                                                                              |
| LXXIX & LXXXI                                                                                                     | h 9° 72                                         | h 9° 72  | h 9° 18  | h 10° 14 | h 8° 80  | h 7° 74  | h 8° 20  | l 9° 60  | l 7° 46  | l 7° 62  | <i>M</i> = 9'' 20<br><i>w</i> = 8 68<br>$\frac{1}{w}$ = 0 12<br><i>C</i> = 64° 27' 9'' 19    |
|                                                                                                                   | h 9° 48                                         | h 10° 72 | h 11° 02 | h 11° 28 | h 9° 48  | h 8° 02  | h 8° 94  | l 8° 46  | l 8° 86  | l 10° 62 |                                                                                              |
|                                                                                                                   | 9° 60                                           | 10° 22   | 10° 10   | 10° 71   | 9° 14    | 7° 88    | 8° 57    | 9° 03    | 8° 16    | 8° 62    |                                                                                              |
| LXXXI & LXXXIII                                                                                                   | h 27° 72                                        | h 28° 66 | h 28° 24 | h 28° 16 | h 27° 74 | h 29° 40 | h 28° 18 | l 30° 20 | l 29° 88 | l 30° 12 | <i>M</i> = 29'' 06<br><i>w</i> = 8 76<br>$\frac{1}{w}$ = 0 11<br><i>C</i> = 53° 59' 29'' 07  |
|                                                                                                                   | h 29° 04                                        | h 28° 48 | h 27° 50 | h 27° 74 | h 30° 18 | h 30° 82 | h 28° 88 | l 29° 18 | l 31° 18 | l 28° 04 |                                                                                              |
|                                                                                                                   | 28° 38                                          | 28° 57   | 27° 87   | 27° 95   | 29° 22   | 30° 11   | 28° 53   | 29° 69   | 30° 53   | 29° 76   |                                                                                              |
| At LXXXI                                                                                                          |                                                 |          |          |          |          |          |          |          |          |          |                                                                                              |
| <i>January 1852, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                 |          |          |          |          |          |          |          |          |          |                                                                                              |
| Angle between                                                                                                     | Circle readings, telescope being set on LXXXII  |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                   | 0° 1'                                           | 180° 1'  | 7° 18'   | 187° 18' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                                              |
| LXXXII & LXXXV                                                                                                    | "                                               | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 0'' 12<br><i>w</i> = 2 40<br>$\frac{1}{w}$ = 0 42<br><i>C</i> = 48° 33' 0'' 12    |
|                                                                                                                   | h 58° 60                                        | h 55° 90 | l 61° 24 | l 62° 92 | h 59° 92 | h 58° 92 | l 63° 60 | l 59° 74 | h 60° 34 | l 60° 88 |                                                                                              |
|                                                                                                                   | h 60° 22                                        | h 56° 98 | l 59° 34 | l 61° 18 | h 59° 56 | h 57° 28 | l 63° 80 | l 61° 52 | h 59° 32 | l 61° 18 |                                                                                              |
|                                                                                                                   | 59° 41                                          | 56° 44   | 60° 29   | 62° 05   | 59° 74   | 58° 10   | 63° 70   | 60° 63   | 59° 83   | 61° 03   |                                                                                              |

| <i>At LXXXI—(Continued.)</i>                                                                                      |                                                |         |        |          |         |          |         |          |         |          |                                                                                              |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------|--------|----------|---------|----------|---------|----------|---------|----------|----------------------------------------------------------------------------------------------|
| <i>January 1852, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                |         |        |          |         |          |         |          |         |          |                                                                                              |
| Angle between                                                                                                     | Circle readings, telescope being set on LXXXII |         |        |          |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                   | 0° 1'                                          | 180° 1' | 7° 18' | 187° 18' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                                              |
| LXXXV<br>&<br>LXXXVI                                                                                              | "                                              | "       | "      | "        | "       | "        | "       | "        | "       | "        | <i>M</i> = 44''·65<br><i>w</i> = 5·50<br>$\frac{1}{w}$ = 0·18<br><i>C</i> = 43° 33' 44''·65  |
|                                                                                                                   | h45°94                                         | h46°64  | l45°58 | l44°56   | h45°16  | h44°10   | l42°82  | l43°34   | h43°20  | l42°84   |                                                                                              |
|                                                                                                                   | h45°14                                         | h47°52  | l44°94 | l45°86   | h45°50  | h45°62   | l43°62  | l42°66   | h44°38  | l43°64   |                                                                                              |
|                                                                                                                   | 45°54                                          | 47°08   | 45°26  | 45°21    | 45°33   | 44°86    | 43°22   | 43°00    | 43°79   | 43°24    |                                                                                              |
| LXXXVI<br>&<br>LXXXIV                                                                                             | h35°48                                         | h37°12  | l35°00 | l36°68   | h36°84  | h38°10   | l36°08  | l37°58   | h36°44  | h37°06   | <i>M</i> = 36''·66<br><i>w</i> = 14·50<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 44° 25' 36''·66 |
|                                                                                                                   | h34°50                                         | h36°30  | l36°90 | l37°14   | h36°50  | h37°78   | l37°32  | l36°60   | h36°92  | l36°82   |                                                                                              |
|                                                                                                                   | 34°99                                          | 36°71   | 35°95  | 36°91    | 36°67   | 37°94    | 36°70   | 37°09    | 36°68   | 36°94    |                                                                                              |
| LXXXIV<br>&<br>LXXXIII                                                                                            | h41°54                                         | h40°90  | l41°06 | l41°06   | h43°30  | h41°42   | l38°10  | l37°94   | h42°76  | h42°04   | <i>M</i> = 40''·86<br><i>w</i> = 4·21<br>$\frac{1}{w}$ = 0·24<br><i>C</i> = 65° 32' 40''·86  |
|                                                                                                                   | h40°46                                         | h40°60  | l41°70 | l39°28   | h42°00  | h41°56   | l38°02  | l39°92   | h40°12  | l42°98   |                                                                                              |
|                                                                                                                   |                                                |         |        |          |         |          |         |          | h42°06  |          |                                                                                              |
|                                                                                                                   | 41°00                                          | 40°75   | 41°38  | 40°17    | 42°65   | 41°49    | 38°06   | 38°93    | 41°65   | 42°51    |                                                                                              |
| LXXXIII<br>&<br>LXXX                                                                                              | h50°46                                         | h50°32  | l47°32 | l46°26   | h49°42  | h51°42   | l48°70  | l51°38   | h48°46  | h50°34   | <i>M</i> = 49''·62<br><i>w</i> = 4·63<br>$\frac{1}{w}$ = 0·22<br><i>C</i> = 42° 36' 49''·62  |
|                                                                                                                   | h50°52                                         | h50°80  | l48°18 | l48°20   | h50°42  | h50°02   | l51°38  | l51°10   | h49°12  | h50°44   |                                                                                              |
|                                                                                                                   |                                                |         |        |          |         | l47°12   |         |          |         |          |                                                                                              |
|                                                                                                                   | 50°49                                          | 50°56   | 47°75  | 47°23    | 49°92   | 50°72    | 49°07   | 51°24    | 48°79   | 50°39    |                                                                                              |
| LXXX &<br>LXXXIX                                                                                                  | h59°38                                         | h59°56  | l61°78 | l61°88   | h60°10  | h58°70   | l61°00  | l59°38   | h60°44  | h60°22   | <i>M</i> = 0''·31<br><i>w</i> = 6·70<br>$\frac{1}{w}$ = 0·15<br><i>C</i> = 46° 34' 0''·31    |
|                                                                                                                   | h58°42                                         | h59°32  | l61°18 | l63°28   | h58°48  | h59°72   | l60°40  | l61°02   | h61°48  | h60°36   |                                                                                              |
|                                                                                                                   | 58°90                                          | 59°44   | 61°48  | 62°58    | 59°29   | 59°21    | 60°70   | 60°20    | 60°96   | 60°29    |                                                                                              |
| LXXIX &<br>LXXXII                                                                                                 | h 8°28                                         | h 7°80  | l 8°26 | l 10°20  | h 6°80  | h 6°64   | l 7°56  | l 7°42   | h 8°18  | h 8°50   | <i>M</i> = 7''·88<br><i>w</i> = 5·32<br>$\frac{1}{w}$ = 0·19<br><i>C</i> = 68° 44' 7''·88    |
|                                                                                                                   | h 10°66                                        | h 9°90  | l 8°20 | l 8°22   | h 8°62  | h 7°78   | l 6°58  | l 4°60   | h 8°10  | l 6°68   |                                                                                              |
|                                                                                                                   | h 9°88                                         | h 8°44  |        |          |         |          | l 3°84  |          |         |          |                                                                                              |
|                                                                                                                   | 9°61                                           | 8°71    | 8°23   | 9°21     | 7°71    | 7°21     | 7°07    | 5°29     | 8°14    | 7°59     |                                                                                              |

| At LXXXII                                                                                         |                                               |         |        |          |         |          |         |          |         |          |                                                                       |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------|---------|--------|----------|---------|----------|---------|----------|---------|----------|-----------------------------------------------------------------------|
| <i>January 1852, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i>        |                                               |         |        |          |         |          |         |          |         |          |                                                                       |
| Angle<br>between                                                                                  | Circle readings, telescope being set on LXXXV |         |        |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle      |
|                                                                                                   | 0° 1'                                         | 180° 1' | 7° 18' | 187° 12' | 14° 25' | 194° 25' | 21° 36' | 201° 36' | 28° 48' | 208° 49' |                                                                       |
| LXXXV<br>& LXXXI                                                                                  | "                                             | "       | "      | "        | "       | "        | "       | "        | "       | "        | M = 28".36<br>w = 9.07<br>$\frac{1}{w} = 0.11$<br>C = 72° 16' 28".35  |
|                                                                                                   | h29.48                                        | h28.30  | h26.76 | h28.90   | h29.84  | l26.92   | l29.86  | l30.02   | l29.34  | l29.88   |                                                                       |
|                                                                                                   | h27.32                                        | h28.42  | h26.58 | h28.62   | l28.30  | l27.68   | l29.52  | l28.70   | l27.10  | l26.98   |                                                                       |
|                                                                                                   | h27.70                                        |         |        |          |         |          |         |          | l27.72  | l27.52   |                                                                       |
|                                                                                                   | 28.17                                         | 28.36   | 26.67  | 28.76    | 29.07   | 27.30    | 29.69   | 29.36    | 28.05   | 28.13    |                                                                       |
| LXXXI & LXXXIX                                                                                    | h50.64                                        | h52.24  | h51.04 | h50.24   | l49.10  | l50.40   | l49.90  | l49.36   | l48.60  | l48.50   | M = 50".12<br>w = 7.80<br>$\frac{1}{w} = 0.13$<br>C = 64° 14' 50".12  |
|                                                                                                   | h52.22                                        | h51.52  | h50.90 | h50.80   | l49.22  | l50.16   | l50.34  | l48.80   | l49.62  | l48.82   |                                                                       |
|                                                                                                   | 51.43                                         | 51.88   | 50.97  | 50.52    | 49.16   | 50.28    | 50.12   | 49.08    | 49.11   | 48.66    |                                                                       |
| At LXXXIII                                                                                        |                                               |         |        |          |         |          |         |          |         |          |                                                                       |
| <i>January 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                               |         |        |          |         |          |         |          |         |          |                                                                       |
| Angle<br>between                                                                                  | Circle readings, telescope being set on LXXX  |         |        |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle      |
|                                                                                                   | 0° 1'                                         | 180° 1' | 7° 12' | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                       |
| LXXX & LXXXI                                                                                      | "                                             | "       | "      | "        | "       | "        | "       | "        | "       | "        | M = 40".79<br>w = 10.27<br>$\frac{1}{w} = 0.10$<br>C = 83° 23' 40".80 |
|                                                                                                   | h41.64                                        | h40.22  | h40.76 | h39.10   | h38.82  | h42.58   | h40.60  | h40.36   | l41.90  | l40.96   |                                                                       |
|                                                                                                   | h41.60                                        | h40.12  | h43.30 | h40.62   | h39.62  | h40.80   | h40.94  | h39.98   | l40.98  | l41.28   |                                                                       |
|                                                                                                   |                                               |         | h41.46 |          |         |          |         |          |         |          |                                                                       |
|                                                                                                   | 41.62                                         | 40.17   | 41.84  | 39.86    | 39.22   | 41.69    | 40.77   | 40.17    | 41.44   | 41.12    |                                                                       |
| LXXXI & LXXXIV                                                                                    | h8.08                                         | h8.98   | h7.58  | h9.20    | h9.06   | h7.94    | h7.98   | h8.18    | l8.74   | l9.12    | M = 8".12<br>w = 15.76<br>$\frac{1}{w} = 0.06$<br>C = 54° 21' 8".10   |
|                                                                                                   | h7.26                                         | h7.50   | h5.48  | h6.62    | h8.36   | h7.38    | h8.28   | h9.02    | l8.10   | l8.88    |                                                                       |
|                                                                                                   |                                               |         | h6.86  | h8.68    |         |          |         |          |         |          |                                                                       |
|                                                                                                   | 7.67                                          | 8.24    | 6.64   | 8.17     | 8.71    | 7.66     | 8.13    | 8.60     | 8.42    | 9.00     |                                                                       |



| At LXXXIV                                                                                         |                                                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------------------------------------------------------|
| <i>January 1852, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i>        |                                                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| Angle between                                                                                     | Circle readings, telescope being set on LXXXIII  |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                   | 0° 1'                                            | 180° 1'         | 7° 13'          | 187° 13'        | 14° 24'         | 194° 24'        | 21° 37'         | 201° 37'        | 28° 48'         | 208° 48'        |                                                                                       |
| LXXXIII & LXXXI                                                                                   | "                                                | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 12''·46                                                                    |
|                                                                                                   | <i>h</i> 13'·96                                  | <i>h</i> 12'·20 | <i>h</i> 11'·78 | <i>l</i> 13'·20 | <i>l</i> 13'·66 | <i>l</i> 12'·76 | <i>l</i> 13'·32 | <i>l</i> 11'·92 | <i>h</i> 12'·30 | <i>h</i> 12'·68 | <i>w</i> = 14 '10                                                                     |
|                                                                                                   | <i>h</i> 13'·28                                  | <i>h</i> 11'·46 | <i>h</i> 12'·08 | <i>l</i> 11'·20 | <i>l</i> 12'·90 | <i>l</i> 13'·06 | <i>l</i> 12'·86 | <i>l</i> 10'·48 | <i>h</i> 11'·50 | <i>h</i> 12'·62 | $\frac{1}{w}$ = 0 '07                                                                 |
|                                                                                                   | 13'·62                                           | 11'·83          | 11'·93          | 12'·20          | 13'·28          | 12'·91          | 13'·09          | 11'·20          | 11'·90          | 12'·65          | <i>C</i> = 60° 6' 12''·46                                                             |
| LXXXI & LXXXVI                                                                                    | <i>h</i> 12'·40                                  | <i>h</i> 12'·86 | <i>h</i> 13'·52 | <i>l</i> 14'·00 | <i>l</i> 13'·80 | <i>l</i> 14'·90 | <i>l</i> 15'·78 | <i>l</i> 14'·78 | <i>h</i> 13'·48 | <i>h</i> 12'·74 | <i>M</i> = 13''·66                                                                    |
|                                                                                                   | <i>h</i> 13'·08                                  | <i>h</i> 13'·22 | <i>h</i> 14'·56 | <i>l</i> 12'·64 | <i>l</i> 13'·30 | <i>l</i> 13'·12 | <i>l</i> 15'·64 | <i>l</i> 13'·94 | <i>h</i> 13'·52 | <i>h</i> 11'·98 | <i>w</i> = 10 '00                                                                     |
|                                                                                                   |                                                  |                 |                 |                 |                 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0 '10                                                                 |
|                                                                                                   | 12'·74                                           | 13'·04          | 14'·04          | 13'·32          | 13'·55          | 14'·01          | 15'·71          | 14'·36          | 13'·50          | 12'·36          | <i>C</i> = 72° 1' 13''·66                                                             |
| At LXXXV                                                                                          |                                                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| <i>January 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                       |
| Angle between                                                                                     | Circle readings, telescope being set on LXXXVIII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                   | 242° 24'                                         | 62° 24'         | 249° 35'        | 69° 35'         | 256° 47'        | 76° 47'         | 263° 59'        | 83° 59'         | 271° 11'        | 91° 11'         |                                                                                       |
| LXXXVIII & LXXXVII                                                                                | "                                                | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 22''·19                                                                    |
|                                                                                                   | <i>h</i> 22'·06                                  | <i>h</i> 21'·80 | <i>l</i> 23'·26 | <i>l</i> 22'·32 | <i>h</i> 21'·42 | <i>h</i> 22'·24 | <i>h</i> 22'·58 | <i>h</i> 22'·54 | <i>h</i> 22'·04 | <i>h</i> 22'·10 | <i>w</i> = 16 '90                                                                     |
|                                                                                                   | <i>h</i> 22'·28                                  | <i>h</i> 23'·60 | <i>l</i> 22'·52 | <i>l</i> 23'·06 | <i>h</i> 20'·00 | <i>h</i> 21'·14 | <i>h</i> 22'·94 | <i>h</i> 22'·86 | <i>h</i> 21'·34 | <i>h</i> 21'·78 | $\frac{1}{w}$ = 0 '06                                                                 |
|                                                                                                   | 22'·17                                           | 22'·70          | 22'·89          | 22'·69          | 20'·71          | 21'·69          | 22'·76          | 22'·70          | 21'·69          | 21'·94          | <i>C</i> = 60° 31' 22''·19                                                            |
| LXXXVII & LXXXVI                                                                                  | <i>h</i> 19'·30                                  | <i>h</i> 20'·48 | <i>h</i> 21'·28 | <i>h</i> 18'·30 | <i>h</i> 18'·88 | <i>h</i> 18'·86 | <i>h</i> 17'·80 | <i>h</i> 18'·10 | <i>h</i> 19'·08 | <i>h</i> 17'·84 | <i>M</i> = 19''·04                                                                    |
|                                                                                                   | <i>h</i> 19'·34                                  | <i>h</i> 19'·68 | <i>h</i> 19'·14 | <i>h</i> 17'·94 | <i>h</i> 20'·56 | <i>h</i> 18'·02 | <i>h</i> 17'·10 | <i>h</i> 18'·06 | <i>h</i> 20'·16 | <i>h</i> 19'·24 | <i>w</i> = 7 '28                                                                      |
|                                                                                                   | <i>h</i> 19'·66                                  |                 | <i>h</i> 22'·30 |                 |                 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0 '14                                                                 |
|                                                                                                   | 19'·43                                           | 20'·08          | 20'·91          | 18'·12          | 19'·72          | 18'·44          | 17'·45          | 18'·08          | 19'·62          | 18'·54          | <i>C</i> = 57° 5' 19''·05                                                             |
| LXXXVI & LXXXI                                                                                    | <i>h</i> 38'·00                                  | <i>h</i> 38'·72 | <i>h</i> 36'·70 | <i>h</i> 39'·38 | <i>h</i> 36'·42 | <i>h</i> 38'·78 | <i>h</i> 39'·50 | <i>h</i> 38'·06 | <i>h</i> 39'·14 | <i>h</i> 38'·74 | <i>M</i> = 38''·13                                                                    |
|                                                                                                   | <i>h</i> 36'·92                                  | <i>h</i> 40'·08 | <i>h</i> 38'·70 | <i>h</i> 38'·42 | <i>h</i> 36'·26 | <i>h</i> 37'·30 | <i>h</i> 39'·04 | <i>h</i> 38'·30 | <i>h</i> 37'·32 | <i>h</i> 36'·80 | <i>w</i> = 9 '40                                                                      |
|                                                                                                   |                                                  |                 |                 |                 |                 |                 |                 |                 |                 |                 | $\frac{1}{w}$ = 0 '11                                                                 |
|                                                                                                   | 37'·46                                           | 39'·40          | 37'·70          | 38'·90          | 36'·34          | 38'·04          | 39'·27          | 38'·18          | 38'·23          | 37'·77          | <i>C</i> = 63° 7' 38''·13                                                             |

| At LXXXV—(Continued.)                                                                                      |                                                  |           |           |           |           |           |           |           |           |           |                                                                                           |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------------------------------------------------------------------------|
| January 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.                 |                                                  |           |           |           |           |           |           |           |           |           |                                                                                           |
| Angle between                                                                                              | Circle readings, telescope being set on LXXXVIII |           |           |           |           |           |           |           |           |           | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                            | 242° 24'                                         | 62° 24'   | 249° 35'  | 69° 35'   | 256° 47'  | 76° 47'   | 263° 59'  | 83° 59'   | 271° 11'  | 91° 11'   |                                                                                           |
| LXXXI & LXXXII                                                                                             | "                                                | "         | "         | "         | "         | "         | "         | "         | "         | "         | <i>M</i> = 34" 71<br><i>w</i> = 8 60<br>$\frac{1}{w}$ = 0 12<br><i>C</i> = 59° 10' 34" 71 |
|                                                                                                            | h 33° 54'                                        | h 35° 30' | h 34° 34' | h 33° 24' | h 35° 66' | h 34° 96' | h 34° 34' | h 37° 08' | h 34° 70' | h 36° 04' |                                                                                           |
|                                                                                                            | h 34° 24'                                        | h 34° 54' | h 33° 58' | h 33° 98' | h 34° 50' | h 34° 86' | h 32° 98' | h 36° 40' | h 34° 04' | h 35° 90' |                                                                                           |
|                                                                                                            | 33° 89'                                          | 34° 92'   | 33° 96'   | 33° 61'   | 35° 08'   | 34° 91'   | 33° 66'   | 36° 74'   | 34° 37'   | 35° 97'   |                                                                                           |
| At LXXXVI                                                                                                  |                                                  |           |           |           |           |           |           |           |           |           |                                                                                           |
| January 1852, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite. |                                                  |           |           |           |           |           |           |           |           |           |                                                                                           |
| Angle between                                                                                              | Circle readings, telescope being set on LXXXIV   |           |           |           |           |           |           |           |           |           | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                            | 296° 28'                                         | 116° 28'  | 303° 39'  | 123° 39'  | 310° 52'  | 130° 52'  | 318° 3'   | 138° 3'   | 325° 15'  | 145° 15'  |                                                                                           |
| LXXXIV & LXXXI                                                                                             | "                                                | "         | "         | "         | "         | "         | "         | "         | "         | "         | <i>M</i> = 10" 92<br><i>w</i> = 7 74<br>$\frac{1}{w}$ = 0 13<br><i>C</i> = 63° 33' 10" 92 |
|                                                                                                            | l 10° 70'                                        | l 12° 44' | l 10° 98' | l 11° 00' | l 9° 14'  | l 9° 76'  | l 12° 50' | l 8° 72'  | l 11° 44' | l 13° 28' |                                                                                           |
|                                                                                                            | l 11° 12'                                        | l 12° 00' | l 9° 86'  | l 9° 52'  | l 10° 02' | l 9° 84'  | l 11° 64' | l 11° 66' | l 10° 60' | l 11° 82' |                                                                                           |
|                                                                                                            | 10° 91'                                          | 12° 22'   | 10° 42'   | 10° 26'   | 9° 58'    | 9° 80'    | 12° 07'   | 10° 32'   | 11° 02'   | 12° 55'   |                                                                                           |
| LXXXI & LXXXV                                                                                              | h 36° 14'                                        | h 34° 96' | l 34° 00' | l 36° 58' | h 38° 56' | h 36° 70' | l 39° 72' | l 36° 86' | l 36° 50' | l 35° 28' | <i>M</i> = 36" 33<br><i>w</i> = 2 82<br>$\frac{1}{w}$ = 0 35<br><i>C</i> = 73° 18' 36" 34 |
|                                                                                                            | h 37° 64'                                        | h 33° 06' | l 32° 62' | l 36° 62' | h 36° 54' | h 36° 44' | l 39° 22' | l 40° 02' | l 35° 26' | l 36° 02' |                                                                                           |
|                                                                                                            |                                                  |           |           |           | h 37° 46' |           |           | l 35° 28' |           |           |                                                                                           |
|                                                                                                            | 36° 89'                                          | 34° 01'   | 33° 31'   | 36° 60'   | 37° 52'   | 36° 57'   | 39° 47'   | 37° 39'   | 35° 88'   | 35° 65'   |                                                                                           |
| LXXXV & LXXXVII                                                                                            | h 34° 44'                                        | h 32° 86' | l 35° 32' | l 31° 16' | h 31° 48' | h 30° 56' | l 30° 84' | l 30° 70' | l 30° 08' | l 32° 62' | <i>M</i> = 31" 92<br><i>w</i> = 3 04<br>$\frac{1}{w}$ = 0 33<br><i>C</i> = 60° 42' 31" 91 |
|                                                                                                            | h 33° 90'                                        | h 33° 48' | l 34° 00' | l 30° 18' | h 33° 42' | h 28° 40' | l 29° 74' | l 29° 02' | l 32° 02' | l 32° 18' |                                                                                           |
|                                                                                                            |                                                  |           |           |           | h 32° 72' | h 32° 26' |           |           |           |           |                                                                                           |
|                                                                                                            | 34° 17'                                          | 33° 17'   | 34° 66'   | 30° 67'   | 32° 54'   | 30° 41'   | 30° 29'   | 29° 86'   | 31° 05'   | 32° 40'   |                                                                                           |
| LXXXVII & LXXXIX                                                                                           | h 11° 16'                                        | h 13° 24' | h 12° 84' | l 13° 42' | h 12° 14' | h 13° 90' | l 12° 86' | l 14° 34' | l 12° 58' | l 13° 78' | <i>M</i> = 12" 88<br><i>w</i> = 5 63<br>$\frac{1}{w}$ = 0 18<br><i>C</i> = 58° 3' 12" 87  |
|                                                                                                            | h 9° 34'                                         | h 12° 98' | h 14° 88' | l 10° 74' | h 11° 28' | h 14° 16' | l 14° 52' | l 13° 46' | l 12° 54' | l 13° 60' |                                                                                           |
|                                                                                                            |                                                  |           |           | l 11° 82' |           |           |           |           |           |           |                                                                                           |
|                                                                                                            | 10° 25'                                          | 13° 11'   | 13° 86'   | 11° 99'   | 11° 71'   | 14° 03'   | 13° 69'   | 13° 90'   | 12° 56'   | 13° 69'   |                                                                                           |

| At LXXXVII                                                                           |                                                |                |                |                |                |                |                |                |                |                |                                                                                       |
|--------------------------------------------------------------------------------------|------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------------------------------------------------------------------------------|
| February 1852, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite. |                                                |                |                |                |                |                |                |                |                |                |                                                                                       |
| Angle between                                                                        | Circle readings, telescope being set on LXXXIX |                |                |                |                |                |                |                |                |                | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                      | 0°1'                                           | 180°1'         | 7°12'          | 187°12'        | 14°25'         | 194°25'        | 21°37'         | 201°37'        | 28°48'         | 208°48'        |                                                                                       |
| LXXXIX<br>&<br>LXXXVI                                                                | "                                              | "              | "              | "              | "              | "              | "              | "              | "              | "              | <i>M</i> = 21''·47                                                                    |
|                                                                                      | <i>h</i> 21'50                                 | <i>l</i> 21'14 | <i>h</i> 22'32 | <i>h</i> 21'34 | <i>l</i> 21'22 | <i>l</i> 21'42 | <i>l</i> 22'06 | <i>l</i> 21'08 | <i>l</i> 21'96 | <i>h</i> 20'28 | <i>w</i> = 15·20                                                                      |
|                                                                                      | <i>h</i> 22'70                                 | <i>l</i> 21'40 | <i>h</i> 20'46 | <i>l</i> 22'80 | <i>l</i> 20'86 | <i>h</i> 21'82 | <i>l</i> 20'00 | <i>l</i> 23'08 | <i>l</i> 22'16 | <i>h</i> 19'76 | $\frac{1}{w}$ = 0·07                                                                  |
|                                                                                      | 22'10                                          | 21'27          | 21'39          | 22'07          | 21'04          | 21'62          | 21'03          | 22'08          | 22'06          | 20'02          | <i>C</i> = 53° 41' 21''·47                                                            |
| LXXXVI<br>&<br>LXXXV                                                                 | <i>h</i> 10'44                                 | <i>l</i> 8'28  | <i>h</i> 10'16 | <i>h</i> 12'02 | <i>l</i> 9'38  | <i>h</i> 12'12 | <i>l</i> 10'28 | <i>l</i> 10'72 | <i>l</i> 8'10  | <i>h</i> 12'70 | <i>M</i> = 10''·33                                                                    |
|                                                                                      | <i>h</i> 10'82                                 | <i>l</i> 10'50 | <i>h</i> 10'38 | <i>l</i> 9'58  | <i>l</i> 10'14 | <i>h</i> 11'90 | <i>l</i> 10'38 | <i>l</i> 9'00  | <i>l</i> 8'64  | <i>h</i> 11'60 | <i>w</i> = 6·88                                                                       |
|                                                                                      |                                                | <i>l</i> 9'76  |                | <i>l</i> 9'60  |                |                |                |                |                |                | $\frac{1}{w}$ = 0·15                                                                  |
|                                                                                      | 10'63                                          | 9'51           | 10'27          | 10'40          | 9'76           | 12'01          | 10'33          | 9'86           | 8'37           | 12'15          | <i>C</i> = 62° 12' 10''·33                                                            |
| LXXXV<br>&<br>LXXXVIII                                                               | <i>h</i> 53'32                                 | <i>h</i> 51'30 | <i>h</i> 53'08 | <i>h</i> 51'86 | <i>l</i> 54'62 | <i>h</i> 52'02 | <i>l</i> 53'22 | <i>l</i> 53'50 | <i>l</i> 55'06 | <i>h</i> 53'12 | <i>M</i> = 52''·68                                                                    |
|                                                                                      | <i>h</i> 52'14                                 | <i>l</i> 52'04 | <i>h</i> 51'84 | <i>l</i> 53'08 | <i>l</i> 53'28 | <i>h</i> 50'38 | <i>l</i> 51'04 | <i>l</i> 53'62 | <i>l</i> 51'88 | <i>h</i> 52'66 | <i>w</i> = 9·10                                                                       |
|                                                                                      |                                                |                |                |                |                |                |                |                | <i>l</i> 54'26 |                | $\frac{1}{w}$ = 0·11                                                                  |
|                                                                                      | 52'73                                          | 51'67          | 52'46          | 52'47          | 53'95          | 51'20          | 52'13          | 53'56          | 53'73          | 52'89          | <i>C</i> = 55° 15' 52''·69                                                            |
| LXXXVIII<br>& XC                                                                     | <i>h</i> 47'28                                 | <i>h</i> 46'34 | <i>h</i> 49'58 | <i>h</i> 47'44 | <i>l</i> 46'72 | <i>h</i> 48'52 | <i>l</i> 48'18 | <i>l</i> 48'72 | <i>l</i> 49'36 | <i>h</i> 46'28 | <i>M</i> = 47''·93                                                                    |
|                                                                                      | <i>h</i> 45'16                                 | <i>l</i> 48'30 | <i>h</i> 47'68 | <i>l</i> 46'60 | <i>l</i> 47'36 | <i>h</i> 49'08 | <i>l</i> 49'80 | <i>l</i> 49'30 | <i>l</i> 49'20 | <i>h</i> 47'68 | <i>w</i> = 6·80                                                                       |
|                                                                                      | 46'22                                          | 47'32          | 48'63          | 47'02          | 47'04          | 48'80          | 48'99          | 49'01          | 49'28          | 46'98          | $\frac{1}{w}$ = 0·15                                                                  |
|                                                                                      |                                                |                |                |                |                |                |                |                |                |                | <i>C</i> = 54° 45' 47''·93                                                            |
| XC &<br>XCI                                                                          | <i>h</i> 59'80                                 | <i>h</i> 64'28 | <i>h</i> 59'96 | <i>h</i> 61'68 | <i>l</i> 62'40 | <i>h</i> 61'08 | <i>h</i> 61'42 | <i>l</i> 61'08 | <i>l</i> 59'88 | <i>h</i> 62'06 | <i>M</i> = 1''·49                                                                     |
|                                                                                      | <i>h</i> 62'08                                 | <i>l</i> 59'26 | <i>h</i> 62'28 | <i>l</i> 63'26 | <i>l</i> 61'14 | <i>h</i> 62'36 | <i>l</i> 61'08 | <i>l</i> 58'90 | <i>l</i> 62'04 | <i>h</i> 61'70 | <i>w</i> = 9·46                                                                       |
|                                                                                      |                                                | <i>l</i> 63'08 | <i>h</i> 61'76 |                |                |                |                |                | <i>h</i> 62'14 |                | $\frac{1}{w}$ = 0·11                                                                  |
|                                                                                      | 60'94                                          | 62'21          | 61'33          | 62'47          | 61'77          | 61'72          | 61'25          | 59'99          | 61'35          | 61'88          | <i>C</i> = 68° 14' 1''·50                                                             |
| XCI &<br>LXXXIX                                                                      | <i>h</i> 48'06                                 | <i>l</i> 47'68 | <i>h</i> 46'06 | <i>h</i> 46'10 | <i>l</i> 45'12 | <i>h</i> 46'62 | <i>h</i> 45'94 | <i>l</i> 44'80 | <i>l</i> 45'62 | <i>h</i> 46'96 | <i>M</i> = 46''·38                                                                    |
|                                                                                      | <i>h</i> 47'22                                 | <i>l</i> 48'10 | <i>h</i> 47'42 | <i>l</i> 45'22 | <i>l</i> 46'04 | <i>h</i> 45'36 | <i>l</i> 45'48 | <i>l</i> 47'78 | <i>l</i> 45'76 | <i>h</i> 46'54 | <i>w</i> = 10·99                                                                      |
|                                                                                      |                                                |                |                |                |                |                |                | <i>l</i> 45'72 |                |                | $\frac{1}{w}$ = 0·09                                                                  |
|                                                                                      | 47'64                                          | 47'89          | 46'74          | 45'66          | 45'58          | 45'99          | 45'71          | 46'10          | 45'69          | 46'75          | <i>C</i> = 65° 50' 46''·38                                                            |

| At LXXXVIII                                                                                 |                                                |          |         |          |          |          |          |          |          |          |                                                                        |
|---------------------------------------------------------------------------------------------|------------------------------------------------|----------|---------|----------|----------|----------|----------|----------|----------|----------|------------------------------------------------------------------------|
| <i>February 1852, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                |          |         |          |          |          |          |          |          |          |                                                                        |
| Angle<br>between                                                                            | Circle readings, telescope being set on XC     |          |         |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle       |
|                                                                                             | 289° 54'                                       | 119° 54' | 307° 5' | 127° 5'  | 314° 18' | 184° 18' | 321° 29' | 141° 29' | 328° 42' | 148° 42' |                                                                        |
| XC &<br>LXXXVII                                                                             | "                                              | "        | "       | "        | "        | "        | "        | "        | "        | "        | M = 20''·59<br>w = 13·90<br>$\frac{1}{w}$ = 0·07<br>C = 60° 7' 20''·59 |
|                                                                                             | h19°58                                         | h21°92   | l20°98  | l19°06   | l21°72   | l20°16   | l19°26   | l20°84   | h20°50   | h20°66   |                                                                        |
|                                                                                             | h20°70                                         | h21°30   | l22°14  | l21°16   | l20°28   | l19°42   | l20°80   | l21°18   | h18°90   | l21°22   |                                                                        |
|                                                                                             | 20°14                                          | 21°61    | 21°56   | 20°11    | 21°00    | 19°79    | 20°03    | 21°01    | 19°70    | 20°94    |                                                                        |
| LXXXVII<br>&<br>LXXXV                                                                       | h45°74                                         | h45°50   | l50°76  | l47°64   | l49°56   | l47°68   | l46°16   | l49°68   | h46°52   | h45°86   | M = 47''·15<br>w = 5·80<br>$\frac{1}{w}$ = 0·17<br>C = 64° 12' 47''·19 |
|                                                                                             | h44°66                                         | h46°56   | l47°16  | l47°06   | l45°42   | l47°62   | l48°54   | l45°22   | h46°30   | l48°30   |                                                                        |
|                                                                                             |                                                |          | l49°04  |          | l46°34   |          | l47°78   | l48°90   |          | l47°88   |                                                                        |
|                                                                                             | 45°20                                          | 46°03    | 48°99   | 47°35    | 47°11    | 47°65    | 47°49    | 47°93    | 46°41    | 47°35    |                                                                        |
| At LXXXIX                                                                                   |                                                |          |         |          |          |          |          |          |          |          |                                                                        |
| <i>February 1852, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                |          |         |          |          |          |          |          |          |          |                                                                        |
| Angle<br>between                                                                            | Circle readings, telescope being set on LXXXVI |          |         |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle       |
|                                                                                             | 0° 2'                                          | 180° 2'  | 7° 12'  | 187° 12' | 14° 25'  | 194° 25' | 21° 37'  | 201° 37' | 28° 49'  | 208° 49' |                                                                        |
| LXXXVI<br>&<br>LXXXVII                                                                      | "                                              | "        | "       | "        | "        | "        | "        | "        | "        | "        | M = 26''·76<br>w = 6·98<br>$\frac{1}{w}$ = 0·14<br>C = 68° 15' 26''·76 |
|                                                                                             | h26°74                                         | h25°46   | l24°44  | l27°18   | l28°70   | l25°62   | h25°90   | h27°84   | h28°76   | h27°90   |                                                                        |
|                                                                                             | h26°20                                         | h25°10   | l26°58  | l26°88   | l24°86   | l25°50   | h27°38   | h26°00   | h26°66   | l29°20   |                                                                        |
|                                                                                             |                                                |          | l27°16  |          | l28°66   |          |          |          |          |          |                                                                        |
|                                                                                             | 26°47                                          | 25°28    | 26°06   | 27°03    | 27°41    | 25°56    | 26°64    | 26°92    | 27°71    | 28°55    |                                                                        |
| LXXXVII<br>&<br>XCI                                                                         | h45°84                                         | h46°78   | l46°38  | l46°80   | l47°30   | l47°18   | h44°42   | h43°34   | h44°94   | h45°56   | M = 45''·64<br>w = 4·60<br>$\frac{1}{w}$ = 0·22<br>C = 59° 3' 45''·64  |
|                                                                                             | h46°46                                         | h46°94   | l46°60  | l46°46   | l47°28   | l46°50   | h43°12   | h44°18   | h43°16   | h43°64   |                                                                        |
|                                                                                             | 46°15                                          | 46°86    | 46°49   | 46°63    | 47°29    | 46°84    | 43°77    | 43°76    | 44°05    | 44°60    |                                                                        |

| At XC                                                                                                                           |                                               |                    |                               |                    |                               |                               |                               |                    |                               |                    |                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------|-------------------------------|--------------------|-------------------------------|-------------------------------|-------------------------------|--------------------|-------------------------------|--------------------|---------------------------------------------------------------------------------------------------------|
| <i>February and December 1852, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                    |                               |                    |                               |                               |                               |                    |                               |                    |                                                                                                         |
| Angle between                                                                                                                   | Circle readings, telescope being set on XCIII |                    |                               |                    |                               |                               |                               |                    |                               |                    | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle                   |
|                                                                                                                                 | 0° 1'                                         | 180° 1'            | 7° 12'                        | 187° 12'           | 14° 24'                       | 194° 24'                      | 21° 36'                       | 201° 36'           | 28° 48'                       | 208° 48'           |                                                                                                         |
| XCIII & XCII                                                                                                                    | "                                             | "                  | "                             | "                  | "                             | "                             | "                             | "                  | "                             | "                  | <i>M</i> = 58''66<br><i>w</i> = 2.64<br>$\frac{1}{w}$ = 0.38<br><i>C</i> = 51° 15' 58''69               |
|                                                                                                                                 | h 58'66<br>h 59'40                            | h 59'60<br>h 61'50 | h 59'38<br>h 63'20<br>h 62'44 | h 60'14<br>h 58'36 | h 58'02<br>h 59'52            | l 57'22<br>l 60'06<br>l 59'76 | l 57'78<br>l 56'60            | l 59'24<br>l 58'76 | l 56'14<br>l 54'94            | l 57'48<br>l 55'66 |                                                                                                         |
|                                                                                                                                 | 59'03                                         | 60'55              | 61'67                         | 59'25              | 58'77                         | 59'01                         | 57'19                         | 59'00              | 55'54                         | 56'57              |                                                                                                         |
| XCII & XCI                                                                                                                      | h 45'46<br>h 44'34                            | h 46'12<br>h 46'32 | h 49'50<br>h 47'00<br>h 43'90 | h 44'20<br>h 45'00 | h 45'26<br>h 44'88            | l 46'14<br>l 46'46            | l 48'14<br>l 47'92            | l 44'42<br>l 44'60 | l 46'14<br>l 49'72<br>l 49'30 | l 47'12<br>l 48'98 | <i>M</i> = 46''29<br><i>w</i> = 3.54<br>$\frac{1}{w}$ = 0.28<br><i>C</i> = { 61° 47' 46''30<br>* — I 03 |
|                                                                                                                                 | 44'90                                         | 46'22              | 46'80                         | 44'60              | 45'07                         | 46'30                         | 48'03                         | 44'51              | 48'39                         | 48'05              |                                                                                                         |
| XCI & LXXXVII                                                                                                                   | Circle readings, telescope being set on XCI   |                    |                               |                    |                               |                               |                               |                    |                               |                    | <i>M</i> = 54''34<br><i>w</i> = 6.43<br>$\frac{1}{w}$ = 0.16<br><i>C</i> = 55° 40' 54''32               |
|                                                                                                                                 | 804° 21'                                      | 124° 21'           | 311° 31'                      | 131° 32'           | 318° 48'                      | 188° 44'                      | 325° 55'                      | 145° 55'           | 338° 8'                       | 153° 8'            |                                                                                                         |
|                                                                                                                                 | h 55'98<br>h 54'94                            | h 51'98<br>h 53'42 | l 55'00<br>l 56'62            | h 53'46<br>h 53'92 | h 53'66<br>h 56'10<br>h 52'40 | h 54'98<br>h 53'30            | h 57'46<br>h 52'18<br>h 53'18 | l 55'64<br>l 54'90 | l 52'14<br>l 55'54<br>l 53'48 | l 54'74<br>l 53'86 |                                                                                                         |
|                                                                                                                                 | 55'46                                         | 52'70              | 55'81                         | 53'69              | 54'05                         | 54'14                         | 54'27                         | 55'27              | 53'72                         | 54'30              |                                                                                                         |
| LXXXVII & LXXXVIII                                                                                                              | h 51'60<br>h 51'74                            | h 51'80<br>h 50'82 | h 52'94<br>h 51'20            | h 53'10<br>h 52'48 | h 50'86<br>h 50'60            | h 53'16<br>h 52'54<br>h 50'90 | h 49'78<br>h 53'16            | l 51'52<br>l 52'34 | l 53'84<br>l 52'56            | l 53'36<br>l 53'32 | <i>M</i> = 52''12<br><i>w</i> = 9.68<br>$\frac{1}{w}$ = 0.10<br><i>C</i> = 65° 6' 52''11                |
|                                                                                                                                 | 51'67                                         | 51'31              | 52'07                         | 52'79              | 50'73                         | 52'85                         | 51'28                         | 51'93              | 53'20                         | 53'34              |                                                                                                         |

\* Correction for eccentricity of signal at XCI.

| At XCI                                                                                                                                                     |                                                |                  |                  |                            |                            |                  |                  |                            |                            |                  |                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------|------------------|----------------------------|----------------------------|------------------|------------------|----------------------------|----------------------------|------------------|---------------------------------------------------------------------------------------------------------|
| <i>February and December 1852, observed by Captain A. Strange, Lieutenant J. F. Tennant, and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                  |                  |                            |                            |                  |                  |                            |                            |                  |                                                                                                         |
| Angle between                                                                                                                                              | Circle readings, telescope being set on LXXXIX |                  |                  |                            |                            |                  |                  |                            |                            |                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle                   |
|                                                                                                                                                            | 54° 40'                                        | 284° 40'         | 61° 51'          | 241° 51'                   | 69° 8'                     | 249° 8'          | 76° 14'          | 256° 14'                   | 83° 27'                    | 263° 27'         |                                                                                                         |
| LXXXIX & LXXXVII                                                                                                                                           | "                                              | "                | "                | "                          | "                          | "                | "                | "                          | "                          | "                | <i>M</i> = 28".47<br><i>w</i> = 6.10<br>$\frac{1}{w}$ = 0.16<br><i>C</i> = 55° 5' 28".48                |
|                                                                                                                                                            | h28.20<br>l31.78<br>l30.60                     | l28.48<br>l26.20 | l28.72<br>h28.92 | h29.76<br>h27.00<br>h27.20 | h29.02<br>h29.92           | h29.82<br>h29.34 | l26.98<br>l28.42 | l26.50<br>l26.52           | h28.70<br>h27.84           | h28.02<br>h29.68 |                                                                                                         |
|                                                                                                                                                            | 30.19                                          | 27.34            | 28.82            | 27.99                      | 29.47                      | 29.58            | 27.70            | 26.51                      | 28.27                      | 28.85            |                                                                                                         |
| LXXXVII & XC                                                                                                                                               | l5.44                                          | l7.38            | l4.94            | h4.24                      | h5.66                      | h4.50            | l4.00            | l5.24                      | l6.96                      | l5.16            | <i>M</i> = 5".66<br><i>w</i> = 9.36<br>$\frac{1}{w}$ = 0.11<br><i>C</i> = 56° 5' 5".66                  |
|                                                                                                                                                            | l5.36                                          | l7.66            | h4.46            | h6.46<br>h5.72             | h5.00                      | h6.64            | l5.96            | l8.72<br>l3.80<br>l4.84    | l5.30                      | l6.46            |                                                                                                         |
|                                                                                                                                                            | 5.40                                           | 7.52             | 4.70             | 5.47                       | 5.33                       | 5.57             | 4.98             | 5.65                       | 6.13                       | 5.81             |                                                                                                         |
| XC & XCII                                                                                                                                                  | Circle readings, telescope being set on XC     |                  |                  |                            |                            |                  |                  |                            |                            |                  | <i>M</i> = 29".40<br><i>w</i> = 2.14<br>$\frac{1}{w}$ = 0.47<br><i>C</i> = { 58° 31' 29".40<br>* + 1.24 |
|                                                                                                                                                            | 0° 1'                                          | 180° 1'          | 7° 12'           | 187° 18'                   | 14° 26'                    | 194° 26'         | 21° 37'          | 201° 38'                   | 28° 48'                    | 208° 48'         |                                                                                                         |
|                                                                                                                                                            | l30.68<br>l33.36<br>l31.16                     | l31.38<br>l31.04 | l32.62<br>l31.88 | l27.18<br>l27.68           | l30.48<br>l28.24<br>l30.78 | l30.30<br>l29.34 | h25.96<br>h25.98 | h31.26<br>h27.58<br>h25.80 | l31.32<br>l28.08<br>l25.82 | l29.80<br>l28.38 |                                                                                                         |
|                                                                                                                                                            | 31.73                                          | 31.21            | 32.25            | 27.43                      | 29.83                      | 29.82            | 25.97            | 28.21                      | 28.41                      | 29.09            |                                                                                                         |
| XCII & XCIV                                                                                                                                                | l11.88                                         | l12.88           | l15.74           | l15.38                     | l14.52                     | l11.62           | h15.14           | h10.02                     | l10.74                     | l11.80           | <i>M</i> = 13".21<br><i>w</i> = 3.70<br>$\frac{1}{w}$ = 0.27<br><i>C</i> = { 54° 10' 13".26<br>* + 0.96 |
|                                                                                                                                                            | l11.42                                         | l14.12           | l10.66           | l11.50                     | l16.38                     | l12.90           | h18.06<br>h12.92 | h12.72<br>h14.68           | l14.36<br>l13.94           | l11.46           |                                                                                                         |
|                                                                                                                                                            | 11.65                                          | 13.50            | 13.08            | 13.61                      | 15.47                      | 12.26            | 15.37            | 12.47                      | 13.01                      | 11.63            |                                                                                                         |

\* Correction for eccentricity of instrument at XCI.

| At XCII                                                                                                                         |                                              |                                  |                                  |                                  |                                  |                      |                                  |                      |                                  |                                  |                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------|----------------------------------|----------------------|----------------------------------|----------------------------------|--------------------------------------------------------------------------------------------|
| <i>December 1852, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                                  |                                  |                                  |                                  |                      |                                  |                      |                                  |                                  |                                                                                            |
| Angle between                                                                                                                   | Circle readings, telescope being set on XCIV |                                  |                                  |                                  |                                  |                      |                                  |                      |                                  |                                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                                 | 0° 1'                                        | 180° 1'                          | 7° 12'                           | 187° 12'                         | 14° 24'                          | 194° 24'             | 21° 36'                          | 201° 36'             | 23° 48'                          | 208° 48'                         |                                                                                            |
| XCIV & XCI                                                                                                                      | "                                            | "                                | "                                | "                                | "                                | "                    | "                                | "                    | "                                | "                                | <i>M</i> = 19°·04<br><i>w</i> = 3·99<br>$\frac{1}{w}$ = 0·25<br><i>C</i> = 65° 7' 19"·03   |
|                                                                                                                                 | h 16°·60<br>h 18°·70<br>h 17°·28             | h 18°·04<br>h 15°·88<br>h 19°·76 | l 18°·90<br>l 17°·08             | l 18°·60<br>l 22°·30<br>l 22°·60 | h 20°·36<br>h 20°·58             | h 19°·36<br>h 19°·78 | l 20°·58<br>l 20°·72             | l 17°·80<br>l 16°·58 | h 18°·86<br>h 20°·18             | h 18°·46<br>h 18°·28             |                                                                                            |
|                                                                                                                                 | 17·53                                        | 17·89                            | 17·99                            | 21·17                            | 20·47                            | 19·57                | 20·65                            | 17·19                | 19·52                            | 18·37                            |                                                                                            |
| XCI & XC                                                                                                                        | h 45°·82<br>h 45°·92                         | h 46°·18<br>h 47°·38             | l 45°·08<br>l 45°·42             | l 44°·92<br>l 43°·80             | h 44°·20<br>h 45°·84             | h 45°·78<br>h 45°·24 | l 43°·70<br>l 46°·72<br>l 45°·96 | l 44°·28<br>l 45°·66 | h 45°·94<br>h 45°·50             | h 47°·10<br>h 45°·56             | <i>M</i> = 45°·53<br><i>w</i> = 13·67<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 59° 40' 45"·53 |
|                                                                                                                                 | 45·87                                        | 46·78                            | 45·25                            | 44·36                            | 45·02                            | 45·51                | 45·46                            | 44·97                | 45·72                            | 46·33                            |                                                                                            |
| XC & XCIII                                                                                                                      | h 23°·58<br>h 23°·68                         | h 23°·30<br>h 23°·68             | l 23°·40<br>l 21°·74             | l 19°·80<br>l 18°·52             | h 22°·92<br>h 24°·12             | h 24°·76<br>h 24°·56 | l 23°·50<br>l 20°·22<br>l 22°·00 | l 22°·16<br>l 23°·16 | h 23°·66<br>h 21°·50<br>h 21°·84 | h 23°·26<br>h 26°·36<br>h 23°·58 | <i>M</i> = 22"·83<br><i>w</i> = 3·56<br>$\frac{1}{w}$ = 0·28<br><i>C</i> = 61° 35' 22"·83  |
|                                                                                                                                 | 23·63                                        | 23·49                            | 22·57                            | 19·16                            | 23·52                            | 24·66                | 21·91                            | 22·66                | 22·33                            | 24·40                            |                                                                                            |
| XCIII & XCV                                                                                                                     | h 34°·98<br>h 35°·62                         | l 36°·26<br>l 36°·82             | l 36°·76<br>l 36°·66             | l 34°·16<br>l 35°·92             | h 37°·04<br>h 33°·92<br>h 37°·94 | h 35°·24<br>h 35°·06 | l 36°·26<br>l 38°·10             | l 38°·54<br>l 39°·52 | h 36°·02<br>h 36°·86             | h 37°·84<br>h 37°·26             | <i>M</i> = 36"·52<br><i>w</i> = 5·44<br>$\frac{1}{w}$ = 0·18<br><i>C</i> = 61° 8' 36"·52   |
|                                                                                                                                 | 35·30                                        | 36·54                            | 36·71                            | 35·04                            | 36·30                            | 35·15                | 37·18                            | 39·03                | 36·44                            | 37·55                            |                                                                                            |
| XCV & XCVI                                                                                                                      | h 14°·38<br>h 11°·36<br>h 12°·20             | l 12°·94<br>l 14°·46             | l 12°·08<br>l 11°·22             | l 10°·74<br>l 11°·52             | h 12°·02<br>h 12°·68             | h 10°·76<br>h 10°·50 | l 12°·44<br>l 12°·20             | l 11°·82<br>l 12°·42 | h 10°·90<br>h 12°·66             | h 11°·62<br>h 10°·66             | <i>M</i> = 11"·95<br><i>w</i> = 9·88<br>$\frac{1}{w}$ = 0·10<br><i>C</i> = 53° 12' 11"·96  |
|                                                                                                                                 | 12·65                                        | 13·70                            | 11·65                            | 11·13                            | 12·35                            | 10·63                | 12·32                            | 12·12                | 11·78                            | 11·14                            |                                                                                            |
| XCVI & XCIV                                                                                                                     | h 44°·50<br>h 41°·72<br>h 44°·42             | h 44°·72<br>h 46°·18             | l 42°·90<br>l 47°·82<br>l 46°·84 | l 46°·64<br>l 42°·52<br>l 45°·30 | h 43°·34<br>h 41°·74             | h 43°·46<br>h 44°·24 | l 44°·18<br>l 42°·36             | l 44°·36<br>l 42°·16 | h 45°·00<br>h 44°·22             | h 43°·14<br>h 42°·68             | <i>M</i> = 44"·01<br><i>w</i> = 5·14<br>$\frac{1}{w}$ = 0·19<br><i>C</i> = 59° 15' 44"·04  |
|                                                                                                                                 | 43·55                                        | 45·45                            | 45·85                            | 44·82                            | 42·54                            | 43·85                | 43·27                            | 43·26                | 44·61                            | 42·91                            |                                                                                            |

| At XCIII                                                                                           |                                             |         |        |          |         |          |         |          |         |          |                                                                        |
|----------------------------------------------------------------------------------------------------|---------------------------------------------|---------|--------|----------|---------|----------|---------|----------|---------|----------|------------------------------------------------------------------------|
| <i>December 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |         |        |          |         |          |         |          |         |          |                                                                        |
| Angle<br>between                                                                                   | Circle readings, telescope being set on XCV |         |        |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle       |
|                                                                                                    | 0° 1'                                       | 180° 1' | 7° 12' | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                        |
| XCV &<br>XCII                                                                                      | "                                           | "       | "      | "        | "       | "        | "       | "        | "       | "        | M = 3''·77<br>w = 5·52<br>$\frac{1}{w}$ = 0·18<br>C = 68° 52' 3''·76   |
|                                                                                                    | h65°72                                      | h59°98  | h61°34 | h63°10   | h63°10  | h62°42   | l64°08  | l65°58   | l64°84  | l64°82   |                                                                        |
|                                                                                                    | h63°44                                      | h64°12  | h62°44 | h62°80   | h63°98  | h64°36   | l63°06  | l66°16   | l64°68  | l65°06   |                                                                        |
|                                                                                                    | h62°76                                      | h64°20  |        |          |         |          |         |          |         |          |                                                                        |
|                                                                                                    | 63°97                                       | 62°77   | 61°89  | 62°95    | 63°54   | 63°39    | 63°57   | 65°87    | 64°76   | 64°94    |                                                                        |
| XCII &<br>XC                                                                                       | h37°94                                      | h42°68  | h42°88 | h41°36   | h41°32  | h43°30   | l42°50  | l40°62   | l39°58  | l38°86   | M = 41''·07<br>w = 3·66<br>$\frac{1}{w}$ = 0·27<br>C = 67° 8' 41''·06  |
|                                                                                                    | h41°60                                      | h40°48  | h40°80 | h40°00   | h41°04  | l43°96   | l43°46  | l41°46   | l39°62  | l38°04   |                                                                        |
|                                                                                                    | h41°74                                      | h39°34  |        |          |         |          |         |          |         |          |                                                                        |
|                                                                                                    | 40°43                                       | 40°83   | 41°84  | 40°68    | 41°18   | 43°63    | 42°98   | 41°04    | 39°60   | 38°45    |                                                                        |
| At XCIV                                                                                            |                                             |         |        |          |         |          |         |          |         |          |                                                                        |
| <i>December 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |         |        |          |         |          |         |          |         |          |                                                                        |
| Angle<br>between                                                                                   | Circle readings, telescope being set on XCI |         |        |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle       |
|                                                                                                    | 0° 1'                                       | 180° 1' | 7° 12' | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                        |
| XCI &<br>XCII                                                                                      | "                                           | "       | "      | "        | "       | "        | "       | "        | "       | "        | M = 28''·19<br>w = 5·64<br>$\frac{1}{w}$ = 0·18<br>C = 60° 42' 28''·20 |
|                                                                                                    | h28°84                                      | h28°36  | h27°32 | h27°70   | l28°44  | l28°48   | l31°38  | l26°70   | l27°78  | l30°60   |                                                                        |
|                                                                                                    | h27°20                                      | h28°30  | h28°24 | h26°88   | l28°52  | l31°98   | l29°62  | l25°98   | l27°46  | l27°80   |                                                                        |
|                                                                                                    |                                             |         |        |          | l26°82  |          |         |          | l27°04  |          |                                                                        |
|                                                                                                    | 28°02                                       | 28°33   | 27°78  | 27°29    | 28°48   | 29°09    | 30°50   | 26°34    | 27°62   | 28°48    |                                                                        |
| XCII &<br>XCVI                                                                                     | h36°10                                      | h35°34  | h36°88 | h35°26   | l35°32  | l35°52   | l32°60  | l34°64   | l34°94  | l31°62   | M = 35''·40<br>w = 6·19<br>$\frac{1}{w}$ = 0·16<br>C = 65° 0' 35''·39  |
|                                                                                                    | h37°34                                      | h37°16  | h36°82 | h35°26   | l35°74  | l34°14   | l34°32  | l35°40   | l35°14  | l35°46   |                                                                        |
|                                                                                                    |                                             |         |        |          |         |          |         |          | l37°90  |          |                                                                        |
|                                                                                                    | 36°72                                       | 36°25   | 36°85  | 35°26    | 35°53   | 34°83    | 33°46   | 35°02    | 35°04   | 34°99    |                                                                        |



| At XCV                                                                                             |                                                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                             |
|----------------------------------------------------------------------------------------------------|------------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---------------------------------------------------------------------------------------------|
| <i>December 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                             |
| Angle between                                                                                      | Circle readings, telescope being set on XCVIII |                  |                  |                  |                  |                  |                  |                  |                  |                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|                                                                                                    | 284° 10'                                       | 54° 10'          | 241° 21'         | 61° 22'          | 248° 33'         | 68° 34'          | 255° 46'         | 75° 46'          | 262° 58'         | 82° 58'          |                                                                                             |
| XCVIII & XCVII                                                                                     | "                                              | "                | "                | "                | "                | "                | "                | "                | "                | "                | <i>M</i> = 38''·27<br><i>w</i> = 2·48<br>$\frac{1}{w}$ = 0·40<br><i>C</i> = 58° 46' 38''·23 |
|                                                                                                    | <i>h</i> 37° 58'                               | <i>h</i> 37° 04' | <i>l</i> 39° 92' | <i>h</i> 32° 86' | <i>h</i> 35° 82' | <i>h</i> 37° 62' | <i>h</i> 40° 50' | <i>l</i> 41° 06' | <i>h</i> 35° 54' | <i>h</i> 39° 24' |                                                                                             |
|                                                                                                    | <i>h</i> 33° 60'                               | <i>h</i> 40° 40' | <i>h</i> 33° 94' | <i>h</i> 35° 78' | <i>h</i> 37° 86' | <i>l</i> 41° 48' | <i>l</i> 40° 04' | <i>l</i> 40° 28' | <i>h</i> 37° 94' | <i>h</i> 38° 66' |                                                                                             |
|                                                                                                    | <i>h</i> 39° 42'                               | <i>h</i> 40° 44' | <i>h</i> 38° 58' | <i>h</i> 37° 56' |                  | <i>l</i> 37° 34' |                  |                  | <i>h</i> 40° 76' |                  |                                                                                             |
|                                                                                                    | 36·87                                          | 39·29            | 37·48            | 35·40            | 36·84            | 38·81            | 40·27            | 40·67            | 38·08            | 38·95            |                                                                                             |
| XCVII & XCVI                                                                                       | <i>h</i> 29° 80'                               | <i>h</i> 28° 86' | <i>l</i> 28° 28' | <i>h</i> 31° 96' | <i>h</i> 29° 54' | <i>h</i> 31° 94' | <i>h</i> 32° 44' | <i>l</i> 29° 32' | <i>h</i> 29° 70' | <i>h</i> 33° 22' | <i>M</i> = 31''·07<br><i>w</i> = 5·36<br>$\frac{1}{w}$ = 0·19<br><i>C</i> = 62° 57' 31''·06 |
|                                                                                                    | <i>h</i> 31° 98'                               | <i>h</i> 30° 68' | <i>h</i> 30° 68' | <i>h</i> 31° 34' | <i>h</i> 31° 18' | <i>l</i> 32° 74' | <i>l</i> 30° 06' | <i>l</i> 32° 06' | <i>h</i> 31° 14' | <i>h</i> 33° 78' |                                                                                             |
|                                                                                                    | <i>h</i> 30° 92'                               |                  | <i>h</i> 29° 10' |                  |                  |                  | <i>l</i> 30° 68' | <i>l</i> 32° 54' |                  |                  |                                                                                             |
|                                                                                                    | 30° 90'                                        | 29° 77'          | 29° 35'          | 31° 65'          | 30° 36'          | 32° 34'          | 31° 06'          | 31° 31'          | 30° 42'          | 33° 50'          |                                                                                             |
| XCVI & XCV                                                                                         | <i>h</i> 34° 00'                               | <i>h</i> 34° 46' | <i>l</i> 37° 78' | <i>l</i> 36° 40' | <i>h</i> 34° 42' | <i>h</i> 34° 62' | <i>l</i> 35° 12' | <i>l</i> 36° 06' | <i>h</i> 35° 98' | <i>h</i> 31° 86' | <i>M</i> = 34''·91<br><i>w</i> = 5·70<br>$\frac{1}{w}$ = 0·18<br><i>C</i> = 64° 38' 34''·91 |
|                                                                                                    | <i>h</i> 34° 30'                               | <i>h</i> 35° 82' | <i>l</i> 34° 62' | <i>l</i> 37° 14' | <i>h</i> 35° 16' | <i>h</i> 33° 04' | <i>l</i> 35° 12' | <i>l</i> 34° 36' | <i>h</i> 34° 82' | <i>h</i> 33° 14' |                                                                                             |
|                                                                                                    |                                                | 34° 15'          | 35° 14'          | 36° 20'          | 36° 77'          | 34° 79'          | 33° 83'          | 35° 12'          | 35° 21'          | 35° 40'          |                                                                                             |
| XCV & XCVI                                                                                         | <i>h</i> 21° 96'                               | <i>h</i> 19° 36' | <i>l</i> 20° 02' | <i>h</i> 20° 10' | <i>h</i> 20° 20' | <i>h</i> 19° 40' | <i>l</i> 19° 32' | <i>l</i> 17° 74' | <i>h</i> 18° 88' | <i>h</i> 20° 90' | <i>M</i> = 19''·69<br><i>w</i> = 7·06<br>$\frac{1}{w}$ = 0·14<br><i>C</i> = 49° 59' 19''·67 |
|                                                                                                    | <i>h</i> 20° 90'                               | <i>h</i> 18° 06' | <i>l</i> 20° 34' | <i>h</i> 18° 84' | <i>h</i> 19° 46' | <i>h</i> 19° 58' | <i>l</i> 21° 10' | <i>l</i> 19° 88' | <i>h</i> 19° 42' | <i>h</i> 20° 48' |                                                                                             |
|                                                                                                    |                                                |                  |                  |                  |                  |                  |                  | <i>l</i> 15° 56' |                  |                  |                                                                                             |
|                                                                                                    | 21° 43'                                        | 18° 71'          | 20° 18'          | 19° 47'          | 19° 83'          | 19° 49'          | 20° 21'          | 17° 73'          | 19° 15'          | 20° 69'          |                                                                                             |
| At XCVI                                                                                            |                                                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                             |
| <i>December 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                             |
| Angle between                                                                                      | Circle readings, telescope being set on XCVI   |                  |                  |                  |                  |                  |                  |                  |                  |                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|                                                                                                    | 0° 1'                                          | 180° 1'          | 7° 12'           | 187° 13'         | 14° 24'          | 194° 24'         | 21° 36'          | 201° 36'         | 28° 48'          | 208° 48'         |                                                                                             |
| XCVI & XCV                                                                                         | "                                              | "                | "                | "                | "                | "                | "                | "                | "                | "                | <i>M</i> = 41''·52<br><i>w</i> = 9·10<br>$\frac{1}{w}$ = 0·11<br><i>C</i> = 55° 43' 41''·54 |
|                                                                                                    | <i>h</i> 41° 04'                               | <i>h</i> 41° 24' | <i>l</i> 40° 26' | <i>l</i> 42° 38' | <i>h</i> 42° 20' | <i>h</i> 42° 44' | <i>h</i> 40° 50' | <i>h</i> 40° 80' | <i>l</i> 40° 82' | <i>l</i> 40° 94' |                                                                                             |
|                                                                                                    | <i>h</i> 43° 50'                               | <i>h</i> 43° 36' | <i>l</i> 42° 28' | <i>l</i> 40° 06' | <i>h</i> 42° 26' | <i>h</i> 42° 12' | <i>h</i> 41° 44' | <i>h</i> 41° 18' | <i>l</i> 43° 24' | <i>l</i> 39° 62' |                                                                                             |
|                                                                                                    | <i>h</i> 40° 78'                               | <i>h</i> 40° 86' |                  | <i>l</i> 39° 70' |                  |                  |                  |                  | <i>l</i> 44° 60' |                  |                                                                                             |
|                                                                                                    | 41° 77'                                        | 41° 82'          | 41° 27'          | 40° 71'          | 42° 23'          | 42° 28'          | 40° 97'          | 40° 99'          | 42° 89'          | 40° 28'          |                                                                                             |

| At XCVI—(Continued.)                                                                                                                        |                                              |          |          |          |          |          |          |          |          |          |                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------------------------------------------------------------------|
| <i>December 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                                          |                                              |          |          |          |          |          |          |          |          |          |                                                                      |
| Angle<br>between                                                                                                                            | Circle readings, telescope being set on XCIV |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle     |
|                                                                                                                                             | 0° 1'                                        | 180° 2'  | 7° 12'   | 187° 13' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                      |
| XCV &<br>XCIV                                                                                                                               | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 14° 98<br>w = 2 95<br>$\frac{1}{w}$ = 0 34<br>C = 62° 9' 14" 96  |
|                                                                                                                                             | h 15° 12                                     | h 13° 08 | l 16° 60 | l 9° 34  | h 14° 66 | h 15° 08 | h 15° 48 | h 17° 54 | l 17° 00 | l 13° 66 |                                                                      |
|                                                                                                                                             | h 14° 12                                     | h 15° 24 | l 12° 74 | l 10° 96 | h 15° 50 | h 16° 18 | h 14° 92 | h 14° 92 | l 15° 36 | l 17° 32 |                                                                      |
|                                                                                                                                             |                                              | h 10° 78 | l 15° 30 | l 15° 40 |          |          | h 16° 64 |          |          | l 19° 72 |                                                                      |
|                                                                                                                                             | 14° 62                                       | 13° 03   | 14° 88   | 11° 90   | 15° 08   | 15° 63   | 15° 20   | 16° 37   | 16° 18   | 16° 90   |                                                                      |
| XCV &<br>XCVII                                                                                                                              | h 58° 00                                     | h 57° 32 | l 54° 22 | l 61° 02 | h 58° 02 | h 58° 40 | h 56° 70 | h 55° 68 | l 56° 32 | l 58° 40 | M = 56° 83<br>w = 6 92<br>$\frac{1}{w}$ = 0 14<br>C = 57° 9' 56" 84  |
|                                                                                                                                             | h 54° 88                                     | h 55° 56 | l 56° 02 | l 56° 20 | h 56° 86 | h 56° 90 | h 58° 34 | h 56° 88 | l 56° 48 | l 56° 62 |                                                                      |
|                                                                                                                                             | h 57° 12                                     |          |          | l 54° 52 |          |          |          |          |          |          |                                                                      |
|                                                                                                                                             | 56° 67                                       | 56° 44   | 55° 12   | 57° 25   | 57° 44   | 57° 65   | 57° 52   | 56° 28   | 56° 40   | 57° 51   |                                                                      |
| XCVII &<br>XCIX                                                                                                                             | h 22° 24                                     | h 22° 32 | l 25° 44 | l 23° 14 | h 21° 46 | h 21° 30 | h 22° 28 | h 20° 88 | l 21° 80 | l 22° 06 | M = 22° 30<br>w = 4 10<br>$\frac{1}{w}$ = 0 24<br>C = 53° 42' 22" 30 |
|                                                                                                                                             | h 24° 34                                     | h 22° 94 | l 25° 92 | l 23° 90 | h 21° 86 | h 20° 70 | h 20° 72 | h 20° 26 | l 20° 92 | l 21° 52 |                                                                      |
|                                                                                                                                             | 23° 29                                       | 22° 63   | 25° 68   | 23° 52   | 21° 66   | 21° 00   | 21° 50   | 20° 57   | 21° 36   | 21° 79   |                                                                      |
| At XCVII                                                                                                                                    |                                              |          |          |          |          |          |          |          |          |          |                                                                      |
| <i>January 1853, observed by Captain A. Strange, Lieutenant J. F. Tennant and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i> |                                              |          |          |          |          |          |          |          |          |          |                                                                      |
| Angle<br>between                                                                                                                            | Circle readings, telescope being set on XCIX |          |          |          |          |          |          |          |          |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle     |
|                                                                                                                                             | 0° 1'                                        | 180° 2'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48'  | 208° 48' |                                                                      |
| XCIX &<br>XCVI                                                                                                                              | "                                            | "        | "        | "        | "        | "        | "        | "        | "        | "        | M = 16° 67<br>w = 2 80<br>$\frac{1}{w}$ = 0 36<br>C = 53° 55' 16" 67 |
|                                                                                                                                             | h 18° 42                                     | l 14° 68 | h 17° 62 | l 16° 60 | l 13° 10 | h 18° 32 | h 16° 54 | h 15° 30 | h 16° 88 | h 19° 02 |                                                                      |
|                                                                                                                                             | h 18° 32                                     | l 12° 62 | h 17° 76 | l 16° 96 | l 12° 90 | h 17° 54 | h 18° 74 | h 17° 10 | h 16° 54 | h 18° 06 |                                                                      |
|                                                                                                                                             |                                              | l 14° 60 |          |          |          | h 17° 12 |          |          |          |          |                                                                      |
|                                                                                                                                             | 18° 37                                       | 13° 97   | 17° 69   | 16° 78   | 13° 00   | 17° 93   | 17° 47   | 16° 20   | 16° 71   | 18° 54   |                                                                      |

| At XCVII—(Continued.)                                                                                                                   |                                              |                            |                  |                            |                            |                  |                  |                            |                            |                                                                                        |                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------|------------------|----------------------------|----------------------------|------------------|------------------|----------------------------|----------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| January 1853, observed by Captain A. Strange, Lieutenant J. F. Tennant and Mr. C. Lane<br>with Troughton and Simms' 36-inch Theodolite. |                                              |                            |                  |                            |                            |                  |                  |                            |                            |                                                                                        |                                                                                             |
| Angle<br>between                                                                                                                        | Circle readings, telescope being set on XCIX |                            |                  |                            |                            |                  |                  |                            |                            |                                                                                        | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|                                                                                                                                         | 0° 1'                                        | 180° 2'                    | 7° 12'           | 187° 12'                   | 14° 24'                    | 194° 24'         | 21° 36'          | 201° 36'                   | 23° 48'                    | 208° 48'                                                                               |                                                                                             |
| XCVI &<br>XCV                                                                                                                           | "                                            | "                          | "                | "                          | "                          | "                | "                | "                          | "                          | "                                                                                      | <i>M</i> = 34''·57<br><i>w</i> = 3·11<br>$\frac{1}{w}$ = 0·32<br><i>C</i> = 59° 52' 34''·56 |
|                                                                                                                                         | h34'60<br>h36'32<br>l33'50<br>l33'94         | h33'06<br>h33'32<br>l30'00 | l34'42<br>l33'26 | l38'22<br>l38'10           | h34'80<br>h34'12           | h36'32<br>h34'58 | h36'38<br>h34'76 | h33'08<br>h32'40           | h33'68<br>h35'02           | 35'46<br>32'48<br>33'19<br>33'84<br>38'16<br>34'46<br>35'45<br>35'57<br>32'74<br>34'35 |                                                                                             |
| XCV &<br>XCVIII                                                                                                                         | h11'30<br>h10'72                             | l13'26<br>l13'50           | h13'82<br>h13'68 | l13'00<br>l12'82           | l15'44<br>l14'16           | h12'98<br>h14'54 | h13'88<br>h13'64 | h13'70<br>h14'14           | h18'10<br>h14'54<br>h16'46 | h14'14<br>h13'66                                                                       | <i>M</i> = 13''·76<br><i>w</i> = 4·92<br>$\frac{1}{w}$ = 0·20<br><i>C</i> = 69° 25' 13''·77 |
|                                                                                                                                         | 11'01                                        | 13'38                      | 13'75            | 12'91                      | 14'80                      | 13'76            | 13'76            | 13'92                      | 16'37                      | 13'90                                                                                  |                                                                                             |
| XCVIII<br>& C                                                                                                                           | l67'30<br>l67'74                             | l64'88<br>l65'34           | l62'36<br>l60'40 | l60'98<br>l65'76<br>l62'96 | l59'98<br>l61'04           | l63'14<br>l63'40 | l64'92<br>l64'88 | l62'80<br>l63'46<br>l64'34 | l63'22<br>l61'12<br>l61'82 | l61'50<br>l63'64<br>l63'64                                                             | <i>M</i> = 3''·44<br><i>w</i> = 2·24<br>$\frac{1}{w}$ = 0·45<br><i>C</i> = 55° 38' 3''·43   |
|                                                                                                                                         | 67'52                                        | 65'11                      | 61'38            | 63'23                      | 60'51                      | 63'27            | 64'90            | 63'53                      | 62'05                      | 62'93                                                                                  |                                                                                             |
| C & CI                                                                                                                                  | l47'70<br>l47'42                             | l49'90<br>l49'58           | l50'20<br>l51'32 | l51'34<br>l49'22<br>l50'50 | l52'56<br>l50'76           | l49'46<br>l49'80 | l48'28<br>l48'96 | l50'62<br>l48'50<br>l48'44 | l47'76<br>l50'86<br>l48'84 | l50'54<br>l48'84                                                                       | <i>M</i> = 49''·64<br><i>w</i> = 6·32<br>$\frac{1}{w}$ = 0·16<br><i>C</i> = 49° 9' 49''·64  |
|                                                                                                                                         | 47'56                                        | 49'74                      | 50'76            | 50'35                      | 51'66                      | 49'63            | 48'62            | 49'19                      | 49'15                      | 49'69                                                                                  |                                                                                             |
| CI &<br>XCIX                                                                                                                            | h60'32<br>h59'60                             | l64'20<br>l64'44           | h62'36<br>h63'36 | l63'30<br>l63'32           | l62'84<br>l59'70<br>l65'14 | h61'78<br>h61'18 | h62'34<br>h61'38 | h60'56<br>h60'76           | l62'42<br>l60'32           | h61'32<br>h63'02                                                                       | <i>M</i> = 2''·06<br><i>w</i> = 4·74<br>$\frac{1}{w}$ = 0·21<br><i>C</i> = 71° 59' 2''·06   |
|                                                                                                                                         | 59'96                                        | 64'32                      | 62'86            | 63'31                      | 62'56                      | 61'48            | 61'86            | 60'66                      | 61'37                      | 62'17                                                                                  |                                                                                             |

| At XCVIII                                                                                         |                                              |         |        |          |         |          |         |          |         |          |                                                                                           |
|---------------------------------------------------------------------------------------------------|----------------------------------------------|---------|--------|----------|---------|----------|---------|----------|---------|----------|-------------------------------------------------------------------------------------------|
| <i>January 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |         |        |          |         |          |         |          |         |          |                                                                                           |
| Angle between                                                                                     | Circle readings, telescope being set on C    |         |        |          |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                   | 0° 1'                                        | 180° 1' | 7° 12' | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 206° 48' |                                                                                           |
| C & XCVII                                                                                         | "                                            | "       | "      | "        | "       | "        | "       | "        | "       | "        | <i>M</i> = 48"·81<br><i>w</i> = 7·70<br>$\frac{1}{w}$ = 0·13<br><i>C</i> = 71° 35' 48"·82 |
|                                                                                                   | h48°96                                       | h48°70  | h48°56 | h47°18   | h49°62  | h48°78   | l48°50  | l47°88   | l44°96  | l51°66   |                                                                                           |
|                                                                                                   | h48°58                                       | h49°20  | h48°48 | h48°50   | h49°44  | l50°30   | l51°02  | l47°14   | l49°26  | l48°96   |                                                                                           |
|                                                                                                   |                                              |         |        |          |         | l48°52   |         | l48°96   | l50°54  |          |                                                                                           |
|                                                                                                   | 48°77                                        | 48°95   | 48°52  | 47°84    | 49°53   | 49°54    | 49°35   | 47°51    | 47°73   | 50°39    |                                                                                           |
| XCVII & XCV                                                                                       | h7°16                                        | h6°80   | h8°26  | h8°58    | h6°64   | l4°68    | l7°70   | l6°66    | l11°50  | l8°48    | <i>M</i> = 7"·41<br><i>w</i> = 6·10<br>$\frac{1}{w}$ = 0·16<br><i>C</i> = 51° 48' 7"·43   |
|                                                                                                   | h8°36                                        | h6°28   | h8°54  | h7°64    | h6°66   | l8°66    | l6°30   | l5°46    | l7°72   | l10°56   |                                                                                           |
|                                                                                                   |                                              |         |        |          |         | l5°66    |         | l6°84    | l6°54   |          |                                                                                           |
|                                                                                                   | 7°76                                         | 6°54    | 8°40   | 8°11     | 6°65    | 6°33     | 7°00    | 6°06     | 8°69    | 8°53     |                                                                                           |
| At XCIX                                                                                           |                                              |         |        |          |         |          |         |          |         |          |                                                                                           |
| <i>January 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                              |         |        |          |         |          |         |          |         |          |                                                                                           |
| Angle between                                                                                     | Circle readings, telescope being set on XCVI |         |        |          |         |          |         |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle     |
|                                                                                                   | 0° 2'                                        | 180° 2' | 7° 12' | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 206° 48' |                                                                                           |
| XCVI & XCVII                                                                                      | "                                            | "       | "      | "        | "       | "        | "       | "        | "       | "        | <i>M</i> = 20"·22<br><i>w</i> = 4·40<br>$\frac{1}{w}$ = 0·23<br><i>C</i> = 72° 22' 20"·22 |
|                                                                                                   | h20°88                                       | h20°16  | h18°16 | h19°18   | h18°62  | h21°58   | h20°94  | l21°04   | l22°44  | l21°94   |                                                                                           |
|                                                                                                   | h20°38                                       | h18°84  | h17°16 | h19°72   | h18°94  | h19°78   | h19°08  | l21°04   | l22°82  | l21°78   |                                                                                           |
|                                                                                                   | 20°63                                        | 19°50   | 17°66  | 19°45    | 18°78   | 20°68    | 20°01   | 21°04    | 22°63   | 21°86    |                                                                                           |
| XCVII & CI                                                                                        | h44°06                                       | h41°62  | h47°14 | h42°30   | h47°76  | h45°48   | h46°36  | l44°72   | l45°76  | l44°92   | <i>M</i> = 45"·06<br><i>w</i> = 2·70<br>$\frac{1}{w}$ = 0·37<br><i>C</i> = 66° 42' 45"·06 |
|                                                                                                   | h44°10                                       | h42°16  | h47°68 | h43°28   | h47°72  | h45°06   | h47°64  | l44°10   | l44°92  | l44°38   |                                                                                           |
|                                                                                                   | 44°08                                        | 41°89   | 47°41  | 42°79    | 47°74   | 45°27    | 47°00   | 44°41    | 45°34   | 44°65    |                                                                                           |

| At C                                                                                                                           |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------------------------------------------------------------------|
| <i>January 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                                 |
| Angle between                                                                                                                  | Circle readings, telescope being set on CII  |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle           |
|                                                                                                                                | 294° 28'                                     | 114° 28'        | 301° 34'        | 121° 34'        | 308° 46'        | 128° 47'        | 315° 58'        | 135° 58'        | 323° 9'         | 143° 9'         |                                                                                                 |
| CII & CIII                                                                                                                     | <i>l</i> 55° 86                              | <i>l</i> 55° 80 | <i>h</i> 51° 78 | <i>h</i> 52° 94 | <i>h</i> 52° 52 | <i>h</i> 51° 54 | <i>h</i> 55° 48 | <i>h</i> 50° 08 | <i>h</i> 52° 18 | <i>h</i> 52° 34 | <i>M</i> = 52° 43<br><i>w</i> = 4 · 14<br>$\frac{1}{w}$ = 0 · 24<br><i>C</i> = 30° 34' 52" · 44 |
|                                                                                                                                | <i>l</i> 50° 80                              | <i>l</i> 52° 50 | <i>h</i> 49° 56 | <i>h</i> 53° 50 | <i>h</i> 52° 30 | <i>h</i> 52° 72 | <i>h</i> 55° 16 | <i>h</i> 50° 56 | <i>h</i> 52° 98 | <i>h</i> 49° 26 |                                                                                                 |
|                                                                                                                                | <i>l</i> 53° 82                              | <i>l</i> 49° 06 | <i>h</i> 52° 10 | <i>h</i> 53° 14 | <i>h</i> 52° 30 | <i>h</i> 53° 44 | <i>h</i> 55° 06 | <i>h</i> 51° 12 | <i>h</i> 50° 72 | <i>h</i> 51° 32 |                                                                                                 |
|                                                                                                                                | <i>l</i> 53° 74                              | <i>l</i> 53° 54 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                                 |
|                                                                                                                                | 53° 56                                       | 52° 73          | 51° 15          | 53° 19          | 52° 37          | 52° 57          | 55° 23          | 50° 59          | 51° 96          | 50° 97          |                                                                                                 |
| CIII & CI                                                                                                                      | <i>h</i> 11° 80                              | <i>h</i> 14° 16 | <i>h</i> 10° 44 | <i>h</i> 11° 58 | <i>h</i> 11° 66 | <i>h</i> 10° 98 | <i>h</i> 11° 36 | <i>h</i> 11° 92 | <i>h</i> 11° 48 | <i>h</i> 9° 98  | <i>M</i> = 11° 26<br><i>w</i> = 10 · 20<br>$\frac{1}{w}$ = 0 · 10<br><i>C</i> = 35° 3' 11" · 26 |
|                                                                                                                                | <i>h</i> 9° 80                               | <i>h</i> 12° 48 | <i>h</i> 11° 94 | <i>h</i> 10° 64 | <i>h</i> 10° 26 | <i>h</i> 12° 78 | <i>h</i> 10° 40 | <i>h</i> 11° 10 | <i>h</i> 9° 84  | <i>h</i> 10° 58 |                                                                                                 |
|                                                                                                                                | 10° 80                                       | 13° 32          | 11° 19          | 11° 11          | 10° 96          | 11° 88          | 10° 88          | 11° 51          | 10° 66          | 10° 28          |                                                                                                 |
| CI & XCVII                                                                                                                     | <i>h</i> 44° 94                              | <i>h</i> 45° 00 | <i>h</i> 45° 40 | <i>h</i> 46° 94 | <i>h</i> 44° 64 | <i>h</i> 46° 70 | <i>h</i> 44° 74 | <i>h</i> 45° 48 | <i>l</i> 45° 80 | <i>l</i> 45° 62 | <i>M</i> = 45° 45<br><i>w</i> = 4 · 71<br>$\frac{1}{w}$ = 0 · 21<br><i>C</i> = 62° 59' 45" · 45 |
|                                                                                                                                | <i>h</i> 45° 56                              | <i>h</i> 45° 04 | <i>h</i> 43° 66 | <i>h</i> 47° 54 | <i>h</i> 43° 70 | <i>h</i> 45° 88 | <i>h</i> 44° 54 | <i>h</i> 43° 46 | <i>l</i> 47° 66 | <i>l</i> 46° 34 |                                                                                                 |
|                                                                                                                                |                                              |                 |                 |                 |                 |                 | <i>h</i> 44° 96 |                 |                 |                 |                                                                                                 |
|                                                                                                                                | 45° 25                                       | 45° 02          | 44° 53          | 47° 24          | 44° 17          | 46° 29          | 44° 64          | 44° 63          | 46° 73          | 45° 98          |                                                                                                 |
| XCVII & XCVIII                                                                                                                 | <i>h</i> 9° 32                               | <i>h</i> 7° 98  | <i>h</i> 7° 52  | <i>h</i> 6° 34  | <i>h</i> 11° 08 | <i>h</i> 8° 34  | <i>h</i> 9° 94  | <i>h</i> 7° 00  | <i>l</i> 8° 44  | <i>l</i> 6° 72  | <i>M</i> = 8° 18<br><i>w</i> = 4 · 01<br>$\frac{1}{w}$ = 0 · 25<br><i>C</i> = 52° 46' 8" · 18   |
|                                                                                                                                | <i>h</i> 7° 46                               | <i>h</i> 8° 24  | <i>h</i> 6° 20  | <i>h</i> 4° 96  | <i>h</i> 11° 56 | <i>h</i> 8° 90  | <i>h</i> 8° 74  | <i>h</i> 9° 52  | <i>l</i> 7° 46  | <i>l</i> 7° 56  |                                                                                                 |
|                                                                                                                                |                                              |                 |                 |                 |                 |                 | <i>h</i> 8° 74  |                 |                 |                 |                                                                                                 |
|                                                                                                                                | 8° 39                                        | 8° 11           | 6° 86           | 5° 65           | 11° 32          | 8° 62           | 9° 34           | 8° 42           | 7° 95           | 7° 14           |                                                                                                 |
| At CI                                                                                                                          |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                                 |
| <i>February, March, and April 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>           |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                                 |
| Angle between                                                                                                                  | Circle readings, telescope being set on XCIX |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle           |
|                                                                                                                                | 0° 1'                                        | 180° 2'         | 7° 12'          | 187° 13'        | 14° 24'         | 194° 24'        | 21° 36'         | 201° 36'        | 28° 48'         | 208° 48'        |                                                                                                 |
| XCIX & XCVII                                                                                                                   | "                                            | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 12° 57<br><i>w</i> = 8 · 35<br>$\frac{1}{w}$ = 0 · 12<br><i>C</i> = 41° 18' 12" · 57 |
|                                                                                                                                | <i>h</i> 13° 36                              | <i>h</i> 10° 74 | <i>h</i> 13° 88 | <i>h</i> 12° 62 | <i>l</i> 14° 14 | <i>l</i> 13° 80 | <i>l</i> 12° 34 | <i>l</i> 13° 56 | <i>l</i> 11° 06 | <i>l</i> 13° 84 |                                                                                                 |
|                                                                                                                                | <i>h</i> 11° 38                              | <i>h</i> 10° 30 | <i>h</i> 12° 40 | <i>h</i> 11° 46 | <i>l</i> 12° 56 | <i>l</i> 13° 70 | <i>l</i> 12° 50 | <i>l</i> 11° 28 | <i>l</i> 12° 58 | <i>l</i> 13° 66 |                                                                                                 |
|                                                                                                                                |                                              |                 |                 |                 |                 |                 | <i>l</i> 12° 78 |                 |                 |                 |                                                                                                 |
|                                                                                                                                | 12° 37                                       | 10° 52          | 13° 14          | 12° 04          | 13° 35          | 13° 75          | 12° 42          | 12° 54          | 11° 82          | 13° 75          |                                                                                                 |

| At CI—(Continued.)                                                                                                                        |                                              |         |          |          |          |          |          |          |         |          |                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------|----------|----------|----------|----------|----------|----------|---------|----------|---------------------------------------------------------------------------------------|
| <i>February, March, and April 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                      |                                              |         |          |          |          |          |          |          |         |          |                                                                                       |
| Angle between                                                                                                                             | Circle readings, telescope being set on XCIX |         |          |          |          |          |          |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                                                           | 0° 1'                                        | 180° 2' | 7° 12'   | 187° 13' | 14° 24'  | 194° 24' | 21° 36'  | 201° 36' | 28° 48' | 206° 48' |                                                                                       |
| XCVII & C                                                                                                                                 | "                                            | "       | "        | "        | "        | "        | "        | "        | "       | "        | <i>M</i> = 26'' 36                                                                    |
|                                                                                                                                           | h26°56                                       | h27°24  | h25°48   | h26°26   | l26°26   | l25°36   | l27°68   | l25°30   | l26°80  | l25°74   | <i>w</i> = 16 '10                                                                     |
|                                                                                                                                           | h27°96                                       | h25°86  | h26°52   | h27°40   | l25°14   | l25°88   | l27°60   | l26°40   | l25°62  | l26°04   | $\frac{1}{w}$ = 0.06                                                                  |
|                                                                                                                                           | 27°26                                        | 26°55   | 26°00    | 26°83    | 25°70    | 25°62    | 27°64    | 25°85    | 26°21   | 25°89    | <i>C</i> = 67° 50' 26'' 36                                                            |
| C & CII                                                                                                                                   | l60°94                                       | l58°16  | l59°30   | l57°46   | l62°22   | l59°86   | l56°78   | l61°84   | l61°30  | l56°66   | <i>M</i> = 0'' 02                                                                     |
|                                                                                                                                           | l60°40                                       | l60°14  | l58°68   | l57°44   | l62°08   | l62°72   | l56°88   | l61°70   | l62°64  | l60°86   | <i>w</i> = 2 '42                                                                      |
|                                                                                                                                           |                                              |         |          |          | l62°48   |          |          |          | l60°92  |          | $\frac{1}{w}$ = 0.41                                                                  |
|                                                                                                                                           | 60°67                                        | 59°15   | 58°99    | 57°45    | 62°15    | 61°69    | 56°83    | 61°77    | 61°97   | 59°48    | <i>C</i> = 85° 31' 0'' 02                                                             |
| CII & CIII                                                                                                                                | d3°29                                        | d6°41   | d6°65    | d7°41    | d3°05    | d3°39    | d9°21    | d4°23    | d2°77   | d5°30    | <i>M</i> = 5'' 13                                                                     |
|                                                                                                                                           | d4°07                                        | d6°65   | d5°07    | d6°89    | d2°93    | d2°83    | d9°45    | d2°93    | d3°39   | d6°66    | <i>w</i> = 2 '10                                                                      |
|                                                                                                                                           | 3°68                                         | 6°53    | 5°86     | 7°15     | 2°99     | 3°11     | 9°33     | 3°58     | 3°08    | 5°98     | $\frac{1}{w}$ = 0.48                                                                  |
|                                                                                                                                           |                                              |         |          |          |          |          |          |          |         |          | <i>C</i> = 30° 29' 5'' 13                                                             |
| At CII                                                                                                                                    |                                              |         |          |          |          |          |          |          |         |          |                                                                                       |
| <i>February and March 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i> |                                              |         |          |          |          |          |          |          |         |          |                                                                                       |
| Angle between                                                                                                                             | Circle readings, telescope being set on CIV  |         |          |          |          |          |          |          |         |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle |
|                                                                                                                                           | 235° 15'                                     | 55° 15' | 242° 26' | 62° 26'  | 249° 38' | 69° 38'  | 256° 50' | 76° 50'  | 264° 1' | 84° 1'   |                                                                                       |
| CIV & CV                                                                                                                                  | "                                            | "       | "        | "        | "        | "        | "        | "        | "       | "        | <i>M</i> = 20'' 06                                                                    |
|                                                                                                                                           | h20°54                                       | h20°16  | h19°06   | h19°58   | h18°72   | l19°98   | l19°66   | l19°68   | l20°16  | l21°32   | <i>w</i> = 15 '90                                                                     |
|                                                                                                                                           | h20°48                                       | h21°74  | h20°02   | h18°58   | l19°90   | l20°12   | l19°44   | l19°78   | l21°74  | l20°44   | $\frac{1}{w}$ = 0.06                                                                  |
|                                                                                                                                           | 20°51                                        | 20°95   | 19°54    | 19°08    | 19°31    | 20°05    | 19°55    | 19°73    | 20°95   | 20°88    | <i>C</i> = 62° 12' 20'' 06                                                            |
| CV & CIII                                                                                                                                 | h4°02                                        | h4°22   | h5°00    | h5°60    | h2°44    | l2°20    | l0°86    | l3°92    | l2°24   | l2°44    | <i>M</i> = 3'' 02                                                                     |
|                                                                                                                                           | h3°00                                        | h3°78   | h4°74    | h4°46    | l2°16    | l1°54    | l0°92    | l3°24    | l1°08   | l2°62    | <i>w</i> = 5 '00                                                                      |
|                                                                                                                                           | 3°51                                         | 4°00    | 4°87     | 5°03     | 2°30     | 1°87     | 0°89     | 3°58     | 1°66    | 2°53     | $\frac{1}{w}$ = 0.20                                                                  |
|                                                                                                                                           |                                              |         |          |          |          |          |          |          |         |          | <i>C</i> = 62° 34' 3'' 02                                                             |

| <i>At CII—(Continued.)</i>                                                                                                                        |                                              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------------------------------------------------------------------------------------------|
| <i>February and March 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>         |                                              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                              |
| Angle between                                                                                                                                     | Circle readings, telescope being set on CIII |                  |                  |                  |                  |                  |                  |                  |                  |                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                                                   | 124° 48'                                     | 304° 48'         | 131° 59'         | 311° 59'         | 139° 11'         | 315° 11'         | 146° 23'         | 326° 23'         | 153° 35'         | 333° 35'         |                                                                                              |
| CIII & CI                                                                                                                                         | "                                            | "                | "                | "                | "                | "                | "                | "                | "                | "                | <i>M</i> = 49'' 38<br><i>w</i> = 7 42<br>$\frac{1}{w}$ = 0 13<br><i>C</i> = 34° 49' 49'' 38  |
|                                                                                                                                                   | <i>h</i> 51° 10'                             | <i>l</i> 49° 18' | <i>l</i> 51° 28' | <i>l</i> 48° 64' | <i>l</i> 49° 84' | <i>l</i> 49° 38' | <i>l</i> 49° 72' | <i>l</i> 48° 66' | <i>h</i> 49° 58' | <i>h</i> 48° 66' |                                                                                              |
|                                                                                                                                                   | <i>h</i> 50° 50'                             | <i>l</i> 49° 62' | <i>l</i> 51° 32' | <i>l</i> 48° 04' | <i>l</i> 50° 46' | <i>l</i> 46° 84' | <i>l</i> 48° 86' | <i>l</i> 48° 22' | <i>h</i> 49° 54' | <i>h</i> 48° 40' |                                                                                              |
|                                                                                                                                                   | 50° 80'                                      | 49° 40'          | 51° 30'          | 48° 34'          | 50° 15'          | 47° 94'          | 49° 29'          | 48° 44'          | 49° 56'          | 48° 53'          |                                                                                              |
| CI & C                                                                                                                                            | <i>l</i> 55° 16'                             | <i>l</i> 57° 22' | <i>l</i> 57° 64' | <i>l</i> 55° 64' | <i>l</i> 58° 90' | <i>l</i> 57° 14' | <i>l</i> 58° 02' | <i>l</i> 57° 84' | <i>h</i> 57° 42' | <i>h</i> 56° 30' | <i>M</i> = 57'' 34<br><i>w</i> = 9 22<br>$\frac{1}{w}$ = 0 11<br><i>C</i> = 28° 50' 57'' 32  |
|                                                                                                                                                   | <i>l</i> 57° 78'                             | <i>l</i> 57° 74' | <i>l</i> 55° 80' | <i>l</i> 58° 80' | <i>l</i> 57° 58' | <i>l</i> 57° 70' | <i>l</i> 56° 94' | <i>l</i> 59° 22' | <i>h</i> 57° 38' | <i>h</i> 57° 24' |                                                                                              |
|                                                                                                                                                   | <i>l</i> 56° 92'                             |                  |                  | <i>l</i> 55° 62' |                  |                  |                  |                  |                  |                  |                                                                                              |
|                                                                                                                                                   | 56° 62'                                      | 57° 48'          | 56° 72'          | 56° 69'          | 58° 24'          | 57° 42'          | 57° 48'          | 58° 53'          | 57° 40'          | 56° 77'          |                                                                                              |
| <i>At CIII</i>                                                                                                                                    |                                              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                              |
| <i>February, March, and April 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                                                                                              |
| Angle between                                                                                                                                     | Circle readings, telescope being set on CI   |                  |                  |                  |                  |                  |                  |                  |                  |                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                                                   | 0° 1'                                        | 180° 1'          | 7° 12'           | 187° 13'         | 14° 24'          | 194° 25'         | 21° 36'          | 201° 37'         | 28° 48'          | 208° 48'         |                                                                                              |
| CI & C                                                                                                                                            | "                                            | "                | "                | "                | "                | "                | "                | "                | "                | "                | <i>M</i> = 42'' 58<br><i>w</i> = 11 92<br>$\frac{1}{w}$ = 0 08<br><i>C</i> = 28° 56' 42'' 59 |
|                                                                                                                                                   | <i>h</i> 42° 94'                             | <i>h</i> 41° 54' | <i>h</i> 43° 00' | <i>h</i> 41° 36' | <i>h</i> 42° 38' | <i>l</i> 41° 70' | <i>h</i> 43° 88' | <i>h</i> 41° 22' | <i>h</i> 41° 78' | <i>h</i> 43° 40' |                                                                                              |
|                                                                                                                                                   | <i>h</i> 43° 44'                             | <i>h</i> 43° 02' | <i>h</i> 42° 76' | <i>h</i> 42° 32' | <i>l</i> 41° 56' | <i>l</i> 45° 26' | <i>h</i> 43° 78' | <i>h</i> 41° 56' | <i>h</i> 42° 28' | <i>h</i> 43° 10' |                                                                                              |
|                                                                                                                                                   | 43° 19'                                      | 42° 28'          | 42° 88'          | 41° 84'          | 41° 97'          | 43° 11'          | 43° 83'          | 41° 39'          | 42° 03'          | 43° 25'          |                                                                                              |
| C & CII                                                                                                                                           | <i>h</i> 23° 20'                             | <i>h</i> 24° 32' | <i>h</i> 23° 44' | <i>h</i> 22° 50' | <i>h</i> 25° 58' | <i>l</i> 22° 26' | <i>h</i> 23° 24' | <i>h</i> 22° 94' | <i>h</i> 24° 50' | <i>h</i> 23° 42' | <i>M</i> = 23'' 28<br><i>w</i> = 9 26<br>$\frac{1}{w}$ = 0 11<br><i>C</i> = 85° 44' 23'' 27  |
|                                                                                                                                                   | <i>h</i> 24° 02'                             | <i>h</i> 23° 18' | <i>h</i> 22° 94' | <i>h</i> 21° 72' | <i>l</i> 24° 56' | <i>l</i> 20° 24' | <i>h</i> 22° 24' | <i>h</i> 22° 48' | <i>h</i> 23° 54' | <i>h</i> 23° 78' |                                                                                              |
|                                                                                                                                                   |                                              |                  |                  |                  | <i>l</i> 23° 42' |                  |                  |                  |                  |                  |                                                                                              |
|                                                                                                                                                   | 23° 61'                                      | 23° 75'          | 23° 19'          | 22° 11'          | 25° 07'          | 21° 97'          | 22° 74'          | 22° 71'          | 24° 02'          | 23° 60'          |                                                                                              |
| CII & CIV                                                                                                                                         | <i>l</i> 22° 94'                             | <i>l</i> 22° 20' | <i>l</i> 20° 36' | <i>l</i> 21° 18' | <i>l</i> 21° 18' | <i>l</i> 23° 44' | <i>l</i> 21° 26' | <i>l</i> 21° 76' | <i>l</i> 23° 16' | <i>l</i> 22° 30' | <i>M</i> = 21'' 89<br><i>w</i> = 11 67<br>$\frac{1}{w}$ = 0 09<br><i>C</i> = 25° 4' 21'' 89  |
|                                                                                                                                                   | <i>l</i> 22° 28'                             | <i>l</i> 21° 76' | <i>l</i> 20° 78' | <i>l</i> 20° 66' | <i>l</i> 23° 34' | <i>l</i> 22° 08' | <i>l</i> 21° 84' | <i>l</i> 21° 04' | <i>l</i> 23° 38' | <i>l</i> 20° 82' |                                                                                              |
|                                                                                                                                                   |                                              |                  |                  |                  | <i>l</i> 22° 26' |                  |                  |                  |                  |                  |                                                                                              |
|                                                                                                                                                   | 22° 61'                                      | 21° 98'          | 20° 57'          | 20° 92'          | 22° 26'          | 22° 76'          | 21° 55'          | 21° 40'          | 23° 27'          | 21° 56'          |                                                                                              |

| At CIII—(Continued.)                                                                                                                              |                                              |                |                |                |                |                |                |                |                |                                  |                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------------------------|---------------------------------------------------------------------------------------------|
| <i>February, March, and April 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                |                |                |                |                |                |                |                |                                  |                                                                                             |
| Angle between                                                                                                                                     | Circle readings, telescope being set on CI   |                |                |                |                |                |                |                |                |                                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|                                                                                                                                                   | 0° 1'                                        | 180° 1'        | 7° 12'         | 187° 13'       | 14° 24'        | 194° 25'       | 21° 36'        | 201° 37'       | 28° 48'        | 208° 48'                         |                                                                                             |
| CIV & CV                                                                                                                                          | "                                            | "              | "              | "              | "              | "              | "              | "              | "              | "                                | <i>M</i> = 16''·13<br><i>w</i> = 6·12<br>$\frac{1}{w}$ = 0·16<br><i>C</i> = 41° 58' 16''·13 |
|                                                                                                                                                   | <i>h</i> 13·92                               | <i>h</i> 17·84 | <i>h</i> 17·44 | <i>h</i> 17·52 | <i>l</i> 15·64 | <i>l</i> 16·50 | <i>l</i> 15·42 | <i>l</i> 15·12 | <i>l</i> 15·14 | <i>l</i> 14·00                   |                                                                                             |
|                                                                                                                                                   | <i>h</i> 14·00                               | <i>h</i> 16·88 | <i>h</i> 16·92 | <i>h</i> 17·78 | <i>l</i> 16·04 | <i>l</i> 18·40 | <i>l</i> 15·80 | <i>l</i> 15·44 | <i>l</i> 15·60 | <i>l</i> 16·72<br><i>l</i> 16·10 |                                                                                             |
|                                                                                                                                                   | 13·96                                        | 17·36          | 17·18          | 17·65          | 15·84          | 17·45          | 15·61          | 15·28          | 15·37          | 15·61                            |                                                                                             |
| At CIV                                                                                                                                            |                                              |                |                |                |                |                |                |                |                |                                  |                                                                                             |
| <i>February and March 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>         |                                              |                |                |                |                |                |                |                |                |                                  |                                                                                             |
| Angle between                                                                                                                                     | Circle readings, telescope being set on CVII |                |                |                |                |                |                |                |                |                                  | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle       |
|                                                                                                                                                   | 232° 55'                                     | 52° 55'        | 240° 6'        | 60° 6'         | 247° 18'       | 67° 18'        | 254° 30'       | 74° 30'        | 261° 42'       | 81° 42'                          |                                                                                             |
| CVII & CVI                                                                                                                                        | "                                            | "              | "              | "              | "              | "              | "              | "              | "              | "                                | <i>M</i> = 42''·04<br><i>w</i> = 7·32<br>$\frac{1}{w}$ = 0·14<br><i>C</i> = 41° 20' 42''·05 |
|                                                                                                                                                   | <i>h</i> 43·02                               | <i>h</i> 42·46 | <i>l</i> 41·94 | <i>l</i> 43·64 | <i>l</i> 40·34 | <i>l</i> 43·44 | <i>h</i> 42·26 | <i>h</i> 40·20 | <i>h</i> 42·20 | <i>h</i> 41·86                   |                                                                                             |
|                                                                                                                                                   | <i>h</i> 40·56                               | <i>h</i> 45·88 | <i>l</i> 40·94 | <i>l</i> 42·48 | <i>l</i> 41·30 | <i>l</i> 43·06 | <i>h</i> 41·02 | <i>h</i> 41·64 | <i>h</i> 41·76 | <i>h</i> 41·56                   |                                                                                             |
|                                                                                                                                                   | <i>h</i> 41·18                               | <i>h</i> 43·50 |                |                |                |                |                |                |                |                                  |                                                                                             |
|                                                                                                                                                   | 41·59                                        | 43·95          | 41·44          | 43·06          | 40·82          | 43·25          | 41·64          | 40·92          | 41·98          | 41·71                            |                                                                                             |
| CVI & CV                                                                                                                                          | <i>h</i> 18·90                               | <i>h</i> 20·46 | <i>h</i> 16·76 | <i>h</i> 18·60 | <i>h</i> 14·56 | <i>l</i> 20·32 | <i>l</i> 22·88 | <i>l</i> 20·28 | <i>l</i> 19·44 | <i>l</i> 17·62                   | <i>M</i> = 18''·73<br><i>w</i> = 4·09<br>$\frac{1}{w}$ = 0·24<br><i>C</i> = 82° 40' 18''·73 |
|                                                                                                                                                   | <i>h</i> 18·38                               | <i>h</i> 19·78 | <i>h</i> 15·74 | <i>h</i> 18·28 | <i>l</i> 18·64 | <i>l</i> 19·16 | <i>l</i> 19·36 | <i>l</i> 18·50 | <i>l</i> 16·84 | <i>l</i> 19·50                   |                                                                                             |
|                                                                                                                                                   |                                              |                |                |                | <i>l</i> 17·86 |                | <i>l</i> 20·62 |                | <i>l</i> 18·28 |                                  |                                                                                             |
|                                                                                                                                                   | 18·64                                        | 20·12          | 16·25          | 18·44          | 17·02          | 19·74          | 20·95          | 19·39          | 18·19          | 18·56                            |                                                                                             |
| CV & CIII                                                                                                                                         | <i>h</i> 50·22                               | <i>h</i> 49·28 | <i>h</i> 45·92 | <i>h</i> 50·62 | <i>h</i> 51·02 | <i>l</i> 49·50 | <i>l</i> 49·86 | <i>l</i> 50·58 | <i>l</i> 51·56 | <i>l</i> 49·02                   | <i>M</i> = 49''·83<br><i>w</i> = 6·84<br>$\frac{1}{w}$ = 0·15<br><i>C</i> = 44° 41' 49''·81 |
|                                                                                                                                                   | <i>h</i> 51·18                               | <i>h</i> 49·48 | <i>h</i> 48·10 | <i>h</i> 49·92 | <i>l</i> 46·72 | <i>l</i> 50·80 | <i>l</i> 49·50 | <i>l</i> 50·32 | <i>l</i> 51·44 | <i>l</i> 48·86                   |                                                                                             |
|                                                                                                                                                   |                                              |                | <i>h</i> 49·48 |                | <i>l</i> 50·40 |                |                |                |                |                                  |                                                                                             |
|                                                                                                                                                   | 50·70                                        | 49·38          | 47·83          | 50·27          | 49·38          | 50·15          | 49·68          | 50·45          | 51·50          | 48·94                            |                                                                                             |



| <i>At CIV—(Continued.)</i>                                                                                                                |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------------------------------------------------------------------|
| <i>February and March 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i> |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| Angle between                                                                                                                             | Circle readings, telescope being set on CVII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                                           | 232° 55'                                     | 52° 55'         | 240° 6'         | 60° 6'          | 247° 18'        | 67° 18'         | 254° 30'        | 74° 30'         | 261° 42'        | 81° 42'         |                                                                                              |
| CIII & CII                                                                                                                                | "                                            | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 15''·06<br><i>w</i> = 20·63<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 30° 9' 15''·05  |
|                                                                                                                                           | <i>h</i> 15'·04                              | <i>h</i> 16'·62 | <i>l</i> 15'·48 | <i>l</i> 14'·62 | <i>l</i> 14'·66 | <i>l</i> 14'·78 | <i>h</i> 15'·28 | <i>h</i> 15'·06 | <i>l</i> 16'·00 | <i>l</i> 14'·82 |                                                                                              |
|                                                                                                                                           | <i>h</i> 15'·46                              | <i>h</i> 16'·00 | <i>l</i> 13'·24 | <i>l</i> 14'·48 | <i>l</i> 16'·00 | <i>l</i> 13'·66 | <i>h</i> 15'·14 | <i>h</i> 14'·76 | <i>l</i> 14'·54 | <i>l</i> 15'·42 |                                                                                              |
|                                                                                                                                           | 15'·25                                       | 16'·31          | 14'·39          | 14'·55          | 15'·33          | 14'·22          | 15'·21          | 14'·91          | 15'·27          | 15'·12          |                                                                                              |
| <i>At CV</i>                                                                                                                              |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| <i>April 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                                           |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
| Angle between                                                                                                                             | Circle readings, telescope being set on CIII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle        |
|                                                                                                                                           | 0° 1'                                        | 180° 1'         | 7° 12'          | 187° 12'        | 14° 25'         | 194° 25'        | 21° 36'         | 201° 36'        | 28° 48'         | 206° 48'        |                                                                                              |
| CIII & CII                                                                                                                                | "                                            | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 18''·51<br><i>w</i> = 10·52<br>$\frac{1}{w}$ = 0·10<br><i>C</i> = 50° 23' 18''·49 |
|                                                                                                                                           | <i>h</i> 21'·14                              | <i>h</i> 19'·52 | <i>h</i> 15'·44 | <i>h</i> 17'·98 | <i>l</i> 19'·08 | <i>l</i> 18'·14 | <i>h</i> 18'·54 | <i>h</i> 20'·66 | <i>l</i> 20'·96 | <i>l</i> 18'·94 |                                                                                              |
|                                                                                                                                           | <i>h</i> 17'·64                              | <i>h</i> 18'·08 | <i>h</i> 17'·80 | <i>h</i> 17'·96 | <i>l</i> 18'·90 | <i>h</i> 19'·12 | <i>h</i> 19'·38 | <i>h</i> 18'·28 | <i>l</i> 17'·16 | <i>l</i> 18'·14 |                                                                                              |
|                                                                                                                                           | <i>h</i> 17'·08                              |                 | <i>h</i> 17'·28 |                 |                 |                 | <i>h</i> 18'·52 | <i>l</i> 17'·54 |                 |                 |                                                                                              |
|                                                                                                                                           | 18'·62                                       | 18'·80          | 16'·84          | 17'·97          | 18'·99          | 18'·63          | 18'·96          | 19'·15          | 18'·55          | 18'·54          |                                                                                              |
| CII & CIV                                                                                                                                 | <i>h</i> 33'·32                              | <i>h</i> 35'·04 | <i>l</i> 36'·16 | <i>l</i> 36'·46 | <i>l</i> 35'·44 | <i>l</i> 34'·72 | <i>l</i> 35'·46 | <i>l</i> 34'·02 | <i>l</i> 33'·84 | <i>l</i> 35'·48 | <i>M</i> = 35''·31<br><i>w</i> = 14·95<br>$\frac{1}{w}$ = 0·07<br><i>C</i> = 42° 56' 35''·31 |
|                                                                                                                                           | <i>h</i> 36'·54                              | <i>l</i> 35'·50 | <i>l</i> 35'·56 | <i>l</i> 34'·24 | <i>l</i> 36'·48 | <i>l</i> 35'·48 | <i>l</i> 36'·02 | <i>l</i> 34'·80 | <i>l</i> 34'·32 | <i>l</i> 36'·14 |                                                                                              |
|                                                                                                                                           | <i>h</i> 36'·56                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
|                                                                                                                                           | 35'·47                                       | 35'·27          | 35'·86          | 35'·35          | 35'·96          | 35'·10          | 35'·74          | 34'·41          | 34'·08          | 35'·81          |                                                                                              |
| CIV & CVI                                                                                                                                 | <i>h</i> 6'·22                               | <i>h</i> 4'·54  | <i>l</i> 5'·16  | <i>l</i> 4'·70  | <i>l</i> 4'·42  | <i>l</i> 5'·52  | <i>l</i> 4'·58  | <i>l</i> 5'·42  | <i>l</i> 4'·48  | <i>l</i> 4'·02  | <i>M</i> = 4''·45<br><i>w</i> = 19·50<br>$\frac{1}{w}$ = 0·05<br><i>C</i> = 58° 33' 4''·45   |
|                                                                                                                                           | <i>h</i> 3'·72                               | <i>l</i> 4'·26  | <i>l</i> 4'·22  | <i>l</i> 5'·32  | <i>l</i> 2'·98  | <i>l</i> 4'·36  | <i>l</i> 2'·54  | <i>l</i> 4'·80  | <i>l</i> 4'·76  | <i>l</i> 3'·68  |                                                                                              |
|                                                                                                                                           | <i>h</i> 4'·04                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
|                                                                                                                                           | 4'·66                                        | 4'·40           | 4'·69           | 5'·01           | 3'·70           | 4'·94           | 3'·56           | 5'·11           | 4'·62           | 3'·85           |                                                                                              |
| CVI & CVIII                                                                                                                               | <i>h</i> 27'·08                              | <i>h</i> 28'·30 | <i>l</i> 26'·44 | <i>l</i> 28'·38 | <i>l</i> 26'·44 | <i>l</i> 26'·86 | <i>l</i> 26'·82 | <i>l</i> 26'·80 | <i>l</i> 26'·64 | <i>l</i> 26'·36 | <i>M</i> = 26''·99<br><i>w</i> = 32·30<br>$\frac{1}{w}$ = 0·03<br><i>C</i> = 37° 2' 26''·99  |
|                                                                                                                                           | <i>h</i> 27'·06                              | <i>l</i> 26'·60 | <i>l</i> 26'·58 | <i>l</i> 27'·98 | <i>l</i> 26'·76 | <i>l</i> 27'·06 | <i>l</i> 26'·82 | <i>l</i> 26'·60 | <i>l</i> 26'·76 | <i>l</i> 27'·36 |                                                                                              |
|                                                                                                                                           |                                              |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                              |
|                                                                                                                                           | 27'·07                                       | 27'·45          | 26'·51          | 28'·18          | 26'·60          | 26'·96          | 26'·82          | 26'·70          | 26'·70          | 26'·86          |                                                                                              |

| At CVI                                                                                                                          |                                             |         |         |          |         |          |         |          |         |          |                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|----------|------------------------------------------------------------------|
| <i>February 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i> |                                             |         |         |          |         |          |         |          |         |          |                                                                  |
| Angle between                                                                                                                   | Circle readings, telescope being set on CIV |         |         |          |         |          |         |          |         |          | M = Mean of Groups<br>w = Relative Weight<br>C = Concluded Angle |
|                                                                                                                                 | 0° 1'                                       | 180° 1' | 7° 12'  | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                  |
| CIV & CVII                                                                                                                      | "                                           | "       | "       | "        | "       | "        | "       | "        | "       | "        | M = 2''·33                                                       |
|                                                                                                                                 | h 2'26                                      | h 1'70  | h 3'04  | h 2'26   | h 1'94  | h 2'52   | h 3'74  | h 2'30   | l 2'94  | l 2'30   | w = 29·40                                                        |
|                                                                                                                                 | h 2'54                                      | h 1'26  | h 1'90  | h 2'28   | h 2'44  | h 1'96   | h 2'40  | l 0'88   | l 2'64  | l 3'26   | $\frac{l}{w} = 0\cdot03$                                         |
|                                                                                                                                 | 2'40                                        | 1'48    | 2'47    | 2'27     | 2'19    | 2'24     | 3'07    | 1'59     | 2'79    | 2'78     | C = 74° 23' 2''·33                                               |
| CVII & (XXIII)                                                                                                                  | h 9'48                                      | h 8'42  | h 8'52  | h 8'12   | h 8'30  | h 8'00   | h 7'18  | l 7'56   | l 7'28  | l 6'52   | M = 8''·08                                                       |
|                                                                                                                                 | h 8'48                                      | h 7'06  | h 9'20  | h 8'72   | h 7'64  | h 8'70   | h 7'70  | l 9'44   | l 8'00  | l 7'20   | w = 17·20                                                        |
|                                                                                                                                 |                                             |         |         |          |         |          |         |          |         |          | $\frac{l}{w} = 0\cdot06$                                         |
|                                                                                                                                 | 8'98                                        | 7'74    | 8'86    | 8'42     | 7'97    | 8'35     | 7'44    | 8'50     | 7'64    | 6'86     | C = 51° 23' 8''·08                                               |
| (XXIII) & (XXV)                                                                                                                 | l 3'38                                      | l 3'56  | l 4'26  | l 4'48   | l 7'52  | l 5'94   | h 7'28  | h 3'72   | h 4'66  | h 4'38   | M = 4''·82                                                       |
|                                                                                                                                 | l 4'38                                      | l 4'18  | l 4'22  | l 4'64   | l 5'58  | l 4'90   | h 5'38  | h 5'12   | h 3'66  | h 5'22   | w = 8·90                                                         |
|                                                                                                                                 |                                             |         |         |          |         |          |         |          |         |          | $\frac{l}{w} = 0\cdot11$                                         |
|                                                                                                                                 | 3'88                                        | 3'87    | 4'24    | 4'56     | 6'55    | 5'42     | 6'33    | 4'42     | 4'16    | 4'80     | C = 46° 36' 4''·82                                               |
| (XXV) & CIX                                                                                                                     | l 35'02                                     | l 33'88 | l 33'70 | l 35'90  | l 31'82 | l 32'00  | h 31'70 | h 31'70  | h 33'30 | h 33'40  | M = 33''·10                                                      |
|                                                                                                                                 | l 33'80                                     | l 33'48 | l 33'42 | l 34'16  | l 31'12 | l 33'36  | h 31'42 | h 32'16  | h 33'16 | h 33'40  | w = 6·60                                                         |
|                                                                                                                                 |                                             |         |         |          |         |          |         |          |         |          | $\frac{l}{w} = 0\cdot15$                                         |
|                                                                                                                                 | 34'41                                       | 33'68   | 33'56   | 35'03    | 31'47   | 32'68    | 31'56   | 31'93    | 33'23   | 33'40    | C = 32° 15' 33''·10                                              |
| CIX & CVIII                                                                                                                     | l 52'14                                     | l 52'48 | l 51'48 | l 51'54  | l 53'30 | l 53'64  | h 50'74 | h 53'14  | h 52'58 | h 51'92  | M = 52''·26                                                      |
|                                                                                                                                 | l 52'68                                     | l 52'92 | l 51'84 | l 51'48  | l 53'84 | l 53'50  | h 50'08 | h 52'06  | h 52'46 | h 51'40  | w = 10·10                                                        |
|                                                                                                                                 |                                             |         |         |          |         |          |         |          |         |          | $\frac{l}{w} = 0\cdot10$                                         |
|                                                                                                                                 | 52'41                                       | 52'70   | 51'66   | 51'51    | 53'57   | 53'57    | 50'41   | 52'60    | 52'52   | 51'66    | C = 66° 57' 52''·26                                              |
| CVIII & CV                                                                                                                      | h 43'96                                     | h 42'84 | h 44'26 | h 43'14  | h 42'58 | h 41'48  | h 43'90 | h 42'36  | h 44'20 | h 43'84  | M = 43''·25                                                      |
|                                                                                                                                 | h 43'62                                     | h 42'82 | h 45'22 | h 43'12  | h 42'54 | h 42'92  | h 42'96 | h 41'90  | h 44'00 | h 43'36  | w = 13·00                                                        |
|                                                                                                                                 |                                             |         |         |          |         |          |         |          |         |          | $\frac{l}{w} = 0\cdot08$                                         |
|                                                                                                                                 | 43'79                                       | 42'83   | 44'74   | 43'13    | 42'56   | 42'20    | 43'43   | 42'13    | 44'10   | 43'60    | C = 49° 37' 43''·25                                              |
| CV & CIV                                                                                                                        | h 37'30                                     | h 37'20 | h 36'66 | h 38'94  | h 37'88 | h 36'94  | h 37'78 | h 37'88  | h 36'16 | h 36'52  | M = 37''·32                                                      |
|                                                                                                                                 | h 37'82                                     | h 37'82 | h 36'96 | h 37'76  | h 37'44 | h 36'52  | h 37'82 | h 37'86  | h 36'70 | h 36'48  | w = 21·30                                                        |
|                                                                                                                                 |                                             |         |         |          |         |          |         |          |         |          | $\frac{l}{w} = 0\cdot05$                                         |
|                                                                                                                                 | 37'56                                       | 37'51   | 36'81   | 38'35    | 37'66   | 36'73    | 37'80   | 37'87    | 36'43   | 36'50    | C = 38° 46' 37''·32                                              |

## At CVII

February 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on (XXIII) |         |         |          |         |          |         |          |         |          | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                              |
|---------------|-------------------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|----------|-----------------------------------------------------------------------------------------------------|
|               | 0° 1'                                           | 180° 1' | 7° 12'  | 187° 12' | 14° 24' | 194° 24' | 21° 36' | 201° 36' | 28° 48' | 208° 48' |                                                                                                     |
| (XXIII) & CVI | "                                               | "       | "       | "        | "       | "        | "       | "        | "       | "        | $M = 3''\cdot72$<br>$w = 9\cdot20$<br>$\frac{1}{w} = 0\cdot11$<br>$C = 91^{\circ} 21' 3''\cdot72$   |
|               | h 3'84                                          | h 2'98  | h 2'14  | h 4'66   | h 5'98  | h 4'44   | h 4'30  | h 4'66   | h 1'98  | h 2'72   |                                                                                                     |
|               | h 4'04                                          | h 2'66  | h 2'12  | h 4'64   | h 4'28  | h 4'58   | h 3'84  | h 4'02   | h 3'42  | l 3'08   |                                                                                                     |
|               | 3'94                                            | 2'82    | 2'13    | 4'65     | 5'13    | 4'51     | 4'07    | 4'34     | 2'70    | 2'90     |                                                                                                     |
| CVI & CIV     | h 13'24                                         | h 15'62 | h 16'70 | h 16'46  | h 15'38 | h 16'18  | h 15'78 | h 16'34  | h 18'30 | l 17'92  | $M = 16''\cdot29$<br>$w = 5\cdot70$<br>$\frac{1}{w} = 0\cdot18$<br>$C = 64^{\circ} 16' 16''\cdot29$ |
|               | h 13'46                                         | h 17'04 | h 16'78 | h 16'80  | h 16'44 | h 16'40  | h 16'54 | h 14'88  | h 17'58 | l 17'90  |                                                                                                     |
|               | 13'35                                           | 16'33   | 16'74   | 16'63    | 15'91   | 16'29    | 16'16   | 15'61    | 17'94   | 17'91    |                                                                                                     |

## At CVIII

April 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

| Angle between | Circle readings, telescope being set on CV |         |         |          |         |          |         |          |         |          | $M$ = Mean of Groups<br>$w$ = Relative Weight<br>$C$ = Concluded Angle                              |
|---------------|--------------------------------------------|---------|---------|----------|---------|----------|---------|----------|---------|----------|-----------------------------------------------------------------------------------------------------|
|               | 0° 1'                                      | 180° 1' | 7° 12'  | 187° 12' | 14° 24' | 194° 24' | 21° 37' | 201° 36' | 28° 48' | 208° 48' |                                                                                                     |
| CV & CVI      | "                                          | "       | "       | "        | "       | "        | "       | "        | "       | "        | $M = 51''\cdot49$<br>$w = 4\cdot90$<br>$\frac{1}{w} = 0\cdot20$<br>$C = 93^{\circ} 19' 51''\cdot49$ |
|               | h 50'76                                    | h 47'50 | h 52'80 | h 50'42  | h 52'92 | h 51'48  | h 52'96 | h 51'96  | h 52'82 | l 53'32  |                                                                                                     |
|               | h 51'70                                    | h 48'78 | h 51'60 | h 50'54  | h 51'88 | h 51'56  | h 51'98 | h 50'90  | l 51'34 | l 52'64  |                                                                                                     |
|               | 51'23                                      | 48'14   | 52'20   | 50'48    | 52'40   | 51'52    | 52'47   | 51'43    | 52'08   | 52'98    |                                                                                                     |
| CVI & CIX     | h 52'04                                    | h 54'96 | h 50'66 | h 52'40  | h 50'38 | h 51'68  | h 51'10 | h 49'68  | h 51'24 | l 50'54  | $M = 51''\cdot66$<br>$w = 6\cdot00$<br>$\frac{1}{w} = 0\cdot17$<br>$C = 68^{\circ} 39' 51''\cdot66$ |
|               | h 51'12                                    | h 54'66 | h 51'20 | h 52'24  | h 51'58 | h 51'04  | h 51'64 | h 50'58  | h 52'46 | l 52'00  |                                                                                                     |
|               | 51'58                                      | 54'81   | 50'93   | 52'32    | 50'98   | 51'36    | 51'37   | 50'13    | 51'85   | 51'27    |                                                                                                     |

| At CIX                                                                                                                          |                                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------------------------------------------------------------------------------|
| <i>April 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>                                 |                                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                            |
| Angle between                                                                                                                   | Circle readings, telescope being set on CVIII |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                                 | 0° 1'                                         | 180° 1'         | 7° 12'          | 187° 12'        | 14° 25'         | 194° 24'        | 21° 37'         | 201° 36'        | 28° 49'         | 208° 49'        |                                                                                            |
| CVIII & CVI                                                                                                                     | "                                             | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 16° 82<br><i>w</i> = 8 00<br>$\frac{1}{w}$ = 0 13<br><i>C</i> = 44° 22' 16" 82  |
|                                                                                                                                 | <i>h</i> 16° 50                               | <i>h</i> 15° 12 | <i>h</i> 17° 72 | <i>h</i> 17° 28 | <i>h</i> 18° 76 | <i>h</i> 17° 78 | <i>h</i> 16° 10 | <i>h</i> 17° 18 | <i>h</i> 17° 06 | <i>h</i> 16° 06 |                                                                                            |
|                                                                                                                                 | <i>h</i> 16° 42                               | <i>h</i> 15° 10 | <i>h</i> 16° 64 | <i>h</i> 17° 10 | <i>h</i> 19° 46 | <i>h</i> 17° 28 | <i>h</i> 16° 42 | <i>h</i> 17° 08 | <i>h</i> 15° 06 | <i>h</i> 16° 18 |                                                                                            |
|                                                                                                                                 | 16° 46                                        | 15° 11          | 17° 18          | 17° 19          | 19° 11          | 17° 53          | 16° 26          | 17° 13          | 16° 06          | 16° 12          |                                                                                            |
| CVI & (XXV)                                                                                                                     | <i>h</i> 15° 16                               | <i>h</i> 14° 78 | <i>h</i> 12° 86 | <i>h</i> 13° 56 | <i>h</i> 12° 54 | <i>h</i> 12° 20 | <i>h</i> 13° 94 | <i>h</i> 12° 70 | <i>h</i> 13° 82 | <i>h</i> 14° 98 | <i>M</i> = 13° 81<br><i>w</i> = 15 90<br>$\frac{1}{w}$ = 0 06<br><i>C</i> = 95° 15' 13" 81 |
|                                                                                                                                 | <i>h</i> 14° 44                               | <i>h</i> 14° 08 | <i>h</i> 13° 84 | <i>h</i> 14° 06 | <i>h</i> 13° 72 | <i>h</i> 13° 84 | <i>h</i> 15° 00 | <i>h</i> 12° 76 | <i>h</i> 14° 44 | <i>h</i> 13° 48 |                                                                                            |
|                                                                                                                                 | 14° 80                                        | 14° 43          | 13° 35          | 13° 81          | 13° 13          | 13° 02          | 14° 47          | 12° 73          | 14° 13          | 14° 23          |                                                                                            |
| At (XXIII)                                                                                                                      |                                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                            |
| <i>February 1853, observed by Captain A. Strange and Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i> |                                               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                                                                                            |
| Angle between                                                                                                                   | Circle readings, telescope being set on (XXV) |                 |                 |                 |                 |                 |                 |                 |                 |                 | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle      |
|                                                                                                                                 | 68° 52'                                       | 243° 52'        | 71° 2'          | 251° 2'         | 78° 15'         | 258° 14'        | 85° 26'         | 265° 26'        | 92° 39'         | 272° 39'        |                                                                                            |
| (XXV) & CVI                                                                                                                     | "                                             | "               | "               | "               | "               | "               | "               | "               | "               | "               | <i>M</i> = 51" 55<br><i>w</i> = 5 23<br>$\frac{1}{w}$ = 0 19<br><i>C</i> = 64° 35' 51" 56  |
|                                                                                                                                 | <i>h</i> 50° 98                               | <i>h</i> 49° 98 | <i>h</i> 49° 98 | <i>h</i> 49° 82 | <i>l</i> 54° 78 | <i>l</i> 53° 34 | <i>l</i> 50° 84 | <i>l</i> 51° 60 | <i>h</i> 52° 52 | <i>h</i> 50° 00 |                                                                                            |
|                                                                                                                                 | <i>h</i> 51° 58                               | <i>h</i> 51° 66 | <i>h</i> 51° 52 | <i>h</i> 49° 46 | <i>l</i> 51° 30 | <i>l</i> 54° 52 | <i>l</i> 51° 08 | <i>l</i> 52° 18 | <i>h</i> 52° 32 | <i>h</i> 51° 54 |                                                                                            |
|                                                                                                                                 | 51° 28                                        | 50° 82          | 50° 75          | 49° 64          | 53° 07          | 53° 93          | 50° 96          | 51° 89          | 52° 42          | 50° 77          |                                                                                            |
| CVI & CVII                                                                                                                      | <i>h</i> 50° 14                               | <i>h</i> 49° 98 | <i>h</i> 51° 90 | <i>h</i> 50° 84 | <i>l</i> 51° 46 | <i>l</i> 50° 60 | <i>l</i> 50° 76 | <i>l</i> 51° 38 | <i>h</i> 49° 54 | <i>h</i> 50° 96 | <i>M</i> = 50" 54<br><i>w</i> = 20 80<br>$\frac{1}{w}$ = 0 05<br><i>C</i> = 37° 15' 50" 54 |
|                                                                                                                                 | <i>h</i> 50° 10                               | <i>h</i> 50° 32 | <i>h</i> 49° 38 | <i>h</i> 51° 26 | <i>l</i> 51° 82 | <i>l</i> 49° 74 | <i>l</i> 50° 92 | <i>l</i> 50° 36 | <i>h</i> 49° 86 | <i>h</i> 49° 42 |                                                                                            |
|                                                                                                                                 | 50° 12                                        | 50° 15          | 50° 64          | 51° 05          | 51° 64          | 50° 17          | 50° 84          | 50° 87          | 49° 70          | 50° 19          |                                                                                            |

NOTE.—(XXV) appertains to base-line figures.

| At (XXV)                                                                                        |                                             |          |          |          |          |          |          |          |          |          |                                                                                               |
|-------------------------------------------------------------------------------------------------|---------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------------------------------------------------------------------------------------------|
| <i>April 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i> |                                             |          |          |          |          |          |          |          |          |          |                                                                                               |
| Angle<br>between                                                                                | Circle readings, telescope being set on CIX |          |          |          |          |          |          |          |          |          | <i>M</i> = Mean of Groups<br><i>w</i> = Relative Weight<br><i>C</i> = Concluded Angle         |
|                                                                                                 | 0° 1'                                       | 180° 1'  | 7° 12'   | 187° 12' | 14° 24'  | 194° 24' | 21° 37'  | 201° 37' | 28° 48'  | 208° 48' |                                                                                               |
| CIX &<br>CVI                                                                                    | "                                           | "        | "        | "        | "        | "        | "        | "        | "        | "        | <i>M</i> = 14° 41'<br><i>w</i> = 14 '21<br>$\frac{1}{w}$ = 0 '07<br><i>C</i> = 52° 29' 14" 41 |
|                                                                                                 | l 13' 48                                    | l 14' 42 | l 14' 28 | l 13' 72 | l 15' 26 | l 14' 56 | l 15' 82 | l 14' 86 | l 15' 28 | l 13' 28 |                                                                                               |
|                                                                                                 | l 13' 28                                    | l 13' 94 | l 13' 60 | l 13' 44 | l 13' 34 | l 14' 66 | l 15' 52 | l 13' 76 | l 15' 54 | l 14' 34 |                                                                                               |
|                                                                                                 |                                             |          |          | l 15' 30 |          |          |          |          |          |          |                                                                                               |
|                                                                                                 | 13' 38                                      | 14' 18   | 14' 29   | 13' 58   | 14' 87   | 14' 61   | 15' 67   | 14' 31   | 15' 41   | 13' 81   |                                                                                               |
| CVI &<br>(XXIII)                                                                                | l 6' 06                                     | l 5' 72  | l 4' 20  | l 6' 04  | l 5' 16  | l 5' 68  | l 3' 22  | l 5' 52  | l 3' 66  | l 5' 70  | <i>M</i> = 4" 96<br><i>w</i> = 8 '30<br>$\frac{1}{w}$ = 0 '12<br><i>C</i> = 68° 48' 4" 96     |
|                                                                                                 | l 4' 70                                     | l 5' 10  | l 4' 78  | l 5' 88  | l 5' 10  | l 6' 16  | l 3' 84  | l 5' 40  | l 1' 84  | l 5' 40  |                                                                                               |
|                                                                                                 | 5' 38                                       | 5' 41    | 4' 49    | 5' 26    | 5' 13    | 5' 22    | 3' 53    | 5' 46    | 2' 75    | 5' 55    |                                                                                               |

NOTE.—(XXIII) and (XXV) appertain to base-line figures.



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*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
(III)	(IV) & I	25	9'91	8	11'40	
"	I & IV	27	23'00	8	4'62	
(IV)	II & I	24	20'27	8	8'97	
"	II & I	27	24'47	8	6'83	
"	I & (III)	24	12'86	8	7'45	
"	I & (III)	27	25'15	8	3'91	
I	R.M. & (III)	27	16'00	8	11'98	
"	(III) & (IV)	26	29'73	8	11'66	
"	(IV) & II	24	19'48	8	8'22	
"	II & III	25	19'14	3	5'47	
"	IV & R.M.	26	11'22	8	3'62	
II	III & I	24	6'73	8	3'00	
"	I & (IV)	25	7'82	8	8'20	
III	VI & V	27	14'65	8	4'21	
"	V & IV	26	11'69	8	3'19	
"	IV & I	25	18'87	8	6'55	
"	I & II	25	7'76	8	7'24	
IV	(III) & I	25	4'62	8	2'09	
"	I & III	26	7'02	8	5'30	
"	III & V	26	8'82	8	3'84	
"	V & VII	25	12'21	8	3'22	
V	R.M. & VII	25	12'93	8	4'24	
"	VII & IV	25	16'84	8	2'90	
"	IV & III	26	16'90	8	1'74	
"	III & VI	25	12'34	8	2'74	
"	VI & VIII	25	13'35	8	2'17	
"	VIII & VII	25	15'10	8	2'74	
VI	X & IX	26	11'12	8	1'36	
"	IX & VIII	24	13'83	8	3'25	
"	VIII & V	25	7'54	8	3'07	
"	V & III	24	5'15	8	6'66	

NOTE.—(III) and (IV) appertain to base-line figures.

R. M. denotes "Referring-mark."

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
VII	IV & V	24	13'99	8	3'89	
"	V & VIII	25	5'00	8	3'54	
VIII	VII & V	25	5'88	8	0'99	
"	V & VI	24	10'38	8	3'14	
"	VI & IX	25	22'90	8	2'52	
"	IX & XI	24	10'85	8	1'66	
IX	R. M. & XI	24	3'12	8	2'35	
"	XI & VIII	25	2'82	8	3'44	
"	VIII & VI	25	5'46	8	11'11	
"	VI & X	25	5'71	8	10'20	
"	X & XII	24	1'73	8	3'79	
"	XII & XIII	24	2'99	8	2'62	
X	XII & IX	25	6'94	8	6'25	
"	IX & VI	25	10'06	8	3'77	
XI	VIII & IX	20	4'28	10	3'45	
"	IX & XIII	20	4'36	10	20'54	
"	XIII & XIV	20	5'08	10	8'06	
XII	XV & XIII	20	2'40	10	9'59	
"	XIII & IX	24	8'01	8	2'85	
"	IX & X	27	21'92	8	3'54	
XIII	IX & XII	20	7'56	10	13'93	
"	XII & XV	20	8'20	10	13'67	
"	XV & XVI	20	4'46	10	16'75	
"	XVI & XIV	20	6'16	10	18'59	
"	XIV & XI	20	10'32	10	7'88	
"	XI & IX	20	8'26	10	16'85	
XIV	XI & XIII	20	3'58	10	4'34	
"	XIII & XVI	20	1'88	10	8'61	
XV	XVII & XVIII	20	3'52	10	3'89	
"	XVIII & XVI	20	1'78	10	7'13	
"	XVI & XIII	20	4'90	10	5'33	
"	XIII & XII	20	1'92	10	4'65	

R. M. denotes "Referring-mark."



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XVI	XIV & R. M.	21	8.47	10	5.20	
"	R. M. & XIII	23	38.33	10	5.88	
"	XIII & XV	22	20.90	10	11.96	
"	XV & XVII	20	19.79	10	14.00	
"	XVII & XVIII	20	5.38	10	9.64	
XVII	XIX & XX	20	19.76	10	16.99	
"	XX & XVIII	20	4.24	10	11.91	
"	XVIII & XVI	20	5.88	10	10.45	
"	XVI & XV	22	7.86	10	6.80	
XVIII	XVI & XV	20	5.26	10	8.65	
"	XV & XVII	20	3.86	10	5.96	
"	XVII & XIX	20	5.66	10	10.86	
"	XIX & XX	20	5.20	10	16.41	
XIX	XXI & XXII	20	3.94	10	12.22	
"	XXII & XX	20	2.92	10	4.56	
"	XX & XVIII	20	5.52	10	9.55	
"	XVIII & XVII	20	5.58	10	7.16	
XX	XVIII & XVII	20	5.08	10	13.01	
"	XVII & XIX	21	14.78	10	17.67	
"	XIX & XXI	20	11.66	10	14.01	
"	XXI & XXII	39	30.89	10	5.10	
XXI	XXIV & XXIII	20	6.66	10	7.11	
"	XXIII & XXII	22	13.98	10	5.33	
"	XXII & XX	22	12.28	10	2.31	
"	XX & XIX	20	5.26	10	1.23	
XXII	XX & XIX	21	10.38	10	8.05	
"	XIX & XXI	20	4.34	10	1.61	
"	XXI & XXIII	20	5.16	10	21.84	
"	XXIII & XXVI	20	3.28	10	29.18	
XXIII	R. M. & XXII	29	15.82	10	9.73	
"	XXII & XXI	21	6.71	10	8.25	
"	XXI & XXIV	21	11.41	10	7.11	

R. M. denotes "Referring-mark."

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XXIII	XXIV & XXV	23	13'68	10	15'61	
"	XXV & XXVI	24	9'73	10	22'72	
"	XXVI & R. M.	27	5'25	10	6'14	
XXIV	XXV & XXIII	20	4'60	10	2'82	
"	XXIII & XXI	20	0'96	10	4'11	
XXV	XXVII & XXVIII	20	7'38	10	8'72	
"	XXVIII & XXVI	20	3'28	10	6'21	
"	XXVI & XXIII	21	9'38	10	6'43	
"	XXIII & XXIV	20	5'74	10	7'14	
XXVI	XXII & XXIII	21	11'13	10	11'95	
"	XXIII & XXV	20	3'48	10	20'15	
"	XXV & XXVII	20	6'26	10	8'90	
"	XXVII & XXVIII	21	7'66	10	7'12	
XXVII	XXX & XXIX	21	7'77	10	3'17	
"	XXIX & XXVIII	21	10'54	10	10'08	
"	XXVIII & XXVI	20	4'44	10	3'17	
"	XXVI & XXV	21	8'44	10	6'36	
XXVIII	XXVI & XXV	23	8'05	10	14'85	
"	XXV & XXVII	20	10'47	10	19'35	
"	XXVII & XXIX	18	8'30	10	19'30	
"	XXIX & XXXI	18	6'84	10	25'37	
XXIX	XXXIII & XXXI	22	10'49	10	15'64	
"	XXXI & XXVIII	22	11'45	10	8'37	
"	XXVIII & XXVII	20	2'18	10	6'02	
"	XXVII & XXX	20	6'96	10	7'04	
"	XXX & XXXII	21	14'88	10	7'86	
"	XXXII & XXXIII	21	15'69	10	5'03	
XXX	XXXII & XXIX	21	7'96	10	20'77	
"	XXIX & XXVII	20	4'28	10	24'79	
XXXI	XXVIII & XXIX	21	8'22	10	12'59	
"	XXIX & XXXIII	20	3'52	10	12'95	
XXXII	XXXV & XXXIV	20	3'00	10	5'42	

R. M. denotes "Referring-mark."

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XXXII	XXXIV & XXXIII	20	8.36	10	12.68	
"	XXXIII & XXIX	21	8.96	10	7.97	
"	XXIX & XXX	21	5.22	10	11.11	
XXXIII	XXXI & XXIX	20	4.30	10	14.59	
"	XXIX & XXXII	20	8.08	10	5.43	
"	XXXII & XXXIV	20	5.16	10	6.46	
"	XXXIV & XXXVI	21	9.76	10	7.23	
XXXIV	XXXVI & XXXIII	22	12.42	10	4.26	
"	XXXIII & XXXII	20	5.74	10	1.56	
"	XXXII & XXXV	22	7.25	10	6.60	
"	XXXV & XXXVII	21	5.45	10	3.67	
"	XXXVII & XXXVIII	22	14.70	10	3.84	
"	XXXVIII & XXXVI	22	12.79	10	4.62	
XXXV	XXXVII & XXXIV	20	3.30	10	8.04	
"	XXXIV & XXXII'	20	4.52	10	8.59	
XXXVI	XXXIII & XXXIV	21	3.85	10	6.34	
"	XXXIV & XXXVIII	20	2.92	10	6.97	
XXXVII	XL & XXXIX	20	3.60	10	6.65	
"	XXXIX & XXXVIII	20	2.12	10	6.17	
"	XXXVIII & XXXIV	21	5.16	10	2.85	
"	XXXIV & XXXV	21	4.99	10	5.34	
XXXVIII	XXXVI & XXXIV	21	5.31	10	3.24	
"	XXXIV & XXXVII	20	3.52	10	12.81	
"	XXXVII & XXXIX	20	3.54	10	5.52	
"	XXXIX & XLI	20	2.22	10	5.14	
XXXIX	XXXVIII & XXXVII	20	5.72	10	13.70	
"	XXXVII & XL	20	8.48	10	7.97	
"	XL & XLII	20	4.54	10	6.48	
"	XLII & XLI	21	5.27	10	11.11	
"	XLI & XXXVIII	21	9.88	10	21.22	
XL	XLIII & XLII	20	1.60	10	3.36	
"	XLII & XXXIX	20	2.40	10	8.49	
"	XXXIX & XXXVII	21	8.23	10	3.02	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XLI	XXXVIII & XXXIX	20	4'36	10	9'20	
"	XXXIX & XLII	20	3'80	10	3'36	
"	XLII & XLIV	22	8'21	10	11'14	
XLII	R. M. & XXXIX	20	2'30	10	5'05	
"	XXXIX & XL	20	3'18	10	3'21	
"	XL & XLIII	21	7'34	10	8'43	
"	XLIII & XLIV	21	3'79	10	13'21	
"	XLIV & XLI	20	6'44	10	2'72	
"	XLI & R. M.	20	0'66	10	3'22	
XLIII	XLVI & XLV	20	2'84	10	8'13	
"	XLV & XLIV	20	4'20	10	9'55	
"	XLIV & XLII	20	5'88	10	5'59	
"	XLII & XL	21	12'59	10	10'66	
XLIV	XLI & XLII	21	7'83	10	6'81	
"	XLII & XLIII	20	6'04	10	8'96	
"	XLIII & XLV	23	13'03	10	10'57	
"	XLV & XLVII	23	12'77	10	36'54	
XLV	XLVII & XLIV	21	7'12	10	9'48	
"	XLIV & XLIII	21	5'13	10	4'71	
"	XLIII & XLVI	21	5'98	10	4'94	
"	XLVI & XLVIII	21	3'84	10	4'15	
"	XLVIII & XLIX	22	9'55	10	7'49	
"	XLIX & XLVII	22	10'49	10	7'26	
XLVI	XLVIII & XLV	21	7'44	10	4'64	
"	XLV & XLIII	21	6'29	10	11'16	
XLVII	XLIV & XLV	21	6'90	10	8'98	
"	XLV & XLIX	21	6'75	10	14'18	
"	XLIX & L	22	10'53	10	3'86	
XLVIII	LI & XLIX	21	7'20	10	12'58	
"	XLIX & XLV	21	5'24	10	8'53	
"	XLV & XLVI	21	4'96	10	6'58	
XLIX	XLVII & XLV	20	7'12	10	5'15	

R. M. denotes "Referring-mark."

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XLIX	XLV & XLVIII	20	6.68	10	2.47	
"	XLVIII & LI	20	6.98	10	2.78	
"	LI & LII	22	24.15	10	9.18	
"	LII & L	21	4.71	10	14.52	
"	L & XLVII	21	5.68	10	3.99	
L	XLVII & XLIX	21	15.90	10	8.40	
"	XLIX & LII	21	7.19	10	5.90	
LI	LIV & LIII	22	11.16	10	30.63	
"	LIII & LII	24	31.88	10	18.32	
"	LII & XLIX	20	7.12	10	7.39	
"	XLIX & XLVIII	21	5.19	10	11.78	
LII	L & XLIX	22	15.52	10	10.08	
"	XLIX & LI	21	8.85	10	9.80	
"	LI & LIII	23	10.86	10	11.87	
"	LIII & LV	21	7.54	10	3.90	
LIII	LII & LI	20	4.98	10	7.67	
"	LI & LIV	21	16.39	10	13.28	
"	LIV & LVI	20	8.80	10	18.47	
"	LVI & LVII	21	11.71	10	23.01	
"	LVII & LV	22	22.90	10	9.94	
"	LV & LII	22	14.78	10	8.45	
LIV	LVI & LIII	23	35.33	10	12.89	
"	LIII & LI	21	7.32	10	10.62	
LV	LII & LIII	20	6.58	10	35.19	
"	LIII & LVII	21	13.46	10	9.14	
LVI	LIX & LVIII	22	10.77	10	4.88	
"	LVIII & LVII	22	12.59	10	6.39	
"	LVII & LIII	22	28.61	10	50.50	
"	LIII & LIV	21	12.13	10	11.22	
LVII	LV & LIII	22	13.96	10	9.91	
"	LIII & LVI	22	13.50	10	7.28	
"	LVI & LVIII	22	15.64	10	14.04	
"	LVIII & LX	21	5.97	10	26.51	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LVIII	LVII & LVI	23	23'91	10	4'44	
"	LVI & LIX	22	16'19	10	9'39	
"	LIX & LXI	23	30'18	10	11'08	
"	LXI & LXII	21	11'72	10	10'84	
"	LXII & LX	21	11'83	10	11'63	
"	LX & LVII	22	14'80	10	13'48	
LIX	LXI & LVIII	20	2'96	10	12'19	
"	LVIII & LVI	22	11'22	10	13'41	
LX	LVII & LVIII	21	5'96	10	9'62	
"	LVIII & LXII	20	5'10	10	5'63	
LXI	LXIV & LXIII	23	21'78	10	10'15	
"	LXIII & LXII	22	19'68	10	9'37	
"	LXII & LVIII	22	11'22	10	10'31	
"	LVIII & LIX	20	7'38	10	2'60	
LXII	LX & LVIII	21	7'75	10	6'99	
"	LVIII & LXI	22	12'32	10	8'56	
"	LXI & LXIII	22	14'86	10	5'01	
"	LXIII & LXV	20	3'78	10	7'75	
LXIII	LXI & LXIV	20	4'82	10	8'54	
"	LXIV & LXVI	20	4'10	10	10'22	
"	LXVI & LXVII	20	6'72	10	4'69	
"	LXVII & LXV	20	2'84	10	10'76	
"	LXV & LXII	21	7'48	10	9'51	
"	LXII & LXI	21	12'76	10	13'83	
LXIV	LXVI & LXIII	22	17'51	10	12'56	
"	LXIII & LXI	22	13'67	10	7'72	
LXV	LXII & LXIII	20	5'08	10	12'40	
"	LXIII & LXVII	20	3'02	10	17'22	
LXVI	LXVIII & LXIX	20	5'90	10	10'58	
"	LXIX & LXVII	22	15'44	10	24'15	
"	LXVII & LXIII	21	6'78	10	5'60	
"	LXIII & LXIV	21	9'43	10	10'51	
LXVII	LXV & LXIII	20	8'52	10	10'22	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LXVII	LXIII & LXVI	21	5.80	10	11.44	
"	LXVI & LXVIII	21	4.89	10	2.96	
"	LXVIII & LXIX	21	6.44	10	4.97	
LXVIII	LXX & LXXI	21	4.73	10	7.04	
"	LXXI & LXIX	21	7.24	10	8.35	
"	LXIX & LXVII	21	9.04	10	3.18	
"	LXVII & LXVI	20	7.44	10	9.31	
LXIX	LXVII & LXVI	21	14.58	10	11.44	
"	LXVI & LXVIII	22	17.65	10	9.05	
"	LXVIII & LXX	21	10.26	10	9.30	
"	LXX & LXXI	22	15.58	10	3.92	
LXX	LXXII & LXXIII	21	3.97	10	5.54	
"	LXXIII & LXXI	21	5.41	10	7.99	
"	LXXI & LXIX	21	6.34	10	12.22	
"	LXIX & LXVIII	22	11.46	10	14.07	
LXXI	LXIX & LXVIII	21	4.86	10	4.31	
"	LXVIII & LXX	20	6.82	10	2.04	
"	LXX & LXXII	23	18.57	10	3.57	
"	LXXII & LXXIII	22	17.49	10	6.01	
LXXII	LXXIV & LXXV	22	7.05	10	3.67	
"	LXXV & LXXIII	20	1.74	10	6.22	
"	LXXIII & LXXI	20	3.90	10	11.13	
"	LXXI & LXX	21	5.40	10	10.26	
LXXIII	LXXI & LXX	21	9.30	10	7.71	
"	LXX & LXXII	20	7.08	10	6.07	
"	LXXII & LXXIV	21	4.98	10	3.20	
"	LXXIV & LXXV	20	4.36	10	10.21	
LXXIV	LXXVII & LXXVI	22	17.08	10	3.83	
"	LXXVI & LXXV	21	19.73	10	6.94	
"	LXXV & LXXIII	20	8.66	10	5.99	
"	LXXIII & LXXII	23	15.51	10	7.44	
LXXV	LXXIII & LXXII	21	11.16	10	7.44	
"	LXXII & LXXIV	21	7.54	10	17.46	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LXXV	LXXIV & LXXVI	21	22.84	10	8.85	
"	LXXVI & LXXVIII	21	6.60	10	12.63	
LXXVI	LXXV & LXXIV	21	10.04	10	7.74	
"	LXXIV & LXXVII	20	9.12	10	4.77	
"	LXXVII & LXXIX	20	2.00	10	11.27	
"	LXXIX & LXXX	20	5.64	10	21.17	
"	LXXX & LXXXVIII	20	2.72	10	23.43	
"	LXXXVIII & LXXV	20	5.44	10	14.39	
LXXVII	LXXIX & LXXVI	20	2.02	10	6.92	
"	LXXVI & LXXIV	20	4.94	10	2.89	
LXXVIII	LXXV & LXXVI	20	3.34	10	4.52	
"	LXXVI & LXXX	20	2.28	10	3.24	
LXXIX	LXXXII & LXXXI	20	4.10	10	2.74	
"	LXXXI & LXXX	22	14.33	10	2.91	
"	LXXX & LXXVI	21	4.04	10	2.88	
"	LXXVI & LXXVII	21	6.12	10	5.39	
LXXX	LXXVIII & LXXVI	21	13.35	10	7.86	
"	LXXVI & LXXIX	22	17.97	10	3.88	
"	LXXIX & LXXXI	21	11.04	10	7.88	
"	LXXXI & LXXXIII	22	12.18	10	7.81	
LXXXI	LXXXII & LXXXV	20	8.78	10	36.00	
"	LXXXV & LXXXVI	20	4.54	10	15.36	
"	LXXXVI & LXXXIV	20	4.22	10	5.25	
"	LXXXIV & LXXXIII	21	9.38	10	19.28	
"	LXXXIII & LXXX	21	13.38	10	16.35	
"	LXXX & LXXIX	20	5.54	10	12.10	
"	LXXIX & LXXXII	23	18.78	10	13.57	
LXXXII	LXXXV & LXXXI	23	12.54	10	7.60	
"	LXXXI & LXXIX	20	2.52	10	10.88	
LXXXIII	LXXX & LXXXI	21	7.12	10	7.21	
"	LXXXI & LXXXIV	22	8.46	10	4.05	
LXXXIV	LXXXIII & LXXXI	20	4.34	10	5.31	
"	LXXXI & LXXXVI	20	4.10	10	8.03	



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LXXXV	LXXXVIII & LXXXVII	20	4'22	10	4'33	
"	LXXXVII & LXXXVI	22	9'24	10	10'44	
"	LXXXVI & LXXXI	20	8'74	10	7'48	
"	LXXXI & LXXXII	20	3'14	10	9'59	
LXXXVI	LXXXIV & LXXXI	21	8'49	10	9'78	
"	LXXXI & LXXXV	22	18'77	10	28'00	
"	LXXXV & LXXXVII	22	15'10	10	26'24	
"	LXXXVII & LXXXIX	21	9'59	10	13'87	
LXXXVII	LXXXIX & LXXXVI	20	7'96	10	4'02	
"	LXXXVI & LXXXV	22	9'10	10	11'27	
"	LXXXV & LXXXVIII	21	12'67	10	7'12	
"	LXXXVIII & XC	20	9'16	10	11'17	
"	XC & XCI	23	27'92	10	4'42	
"	XCI & LXXXIX	21	7'79	10	6'46	
LXXXVIII	XC & LXXXVII	20	7'70	10	4'62	
"	LXXXVII & LXXXV	25	34'94	10	10'05	
LXXXIX	LXXXVI & LXXXVII	22	19'90	10	8'83	
"	LXXXVII & XCI	20	5'16	10	18'25	
XC	XCIII & XCII	22	21'01	10	29'63	
"	XCII & XCI	22	26'26	10	20'25	
"	XCI & LXXXVII	23	33'76	10	7'88	
"	LXXXVII & LXXXVIII	21	9'52	10	7'18	
XCI	LXXXIX & LXXXVII	22	17'31	10	11'43	
"	LXXXVII & XC	23	23'02	10	5'31	
"	XC & XCII	24	40'61	10	35'33	
"	XCII & XCIV	26	56'23	10	16'46	
XCII	XCIV & XCI	23	23'17	10	18'25	
"	XCI & XC	21	10'06	10	4'38	
"	XC & XCIII	23	17'43	10	22'04	
"	XCIII & XCV	21	13'52	10	13'46	
"	XCV & XCVI	21	9'13	10	7'07	
"	XCVI & XCIV	23	34'52	10	11'20	
XCIII	XCV & XCII	22	20'06	10	12'23	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XCIH	XCH & XC	22	19'55	10	20'44	
XCIV	XCI & XCII	22	24'85	10	11'08	
"	XCH & XCVI	21	25'29	10	9'12	
XCV	XCVIII & XCVII	26	83'25	10	24'45	
"	XCVII & XCVI	24	19'14	10	13'51	
"	XCVI & XCH	20	10'70	10	13'11	
"	XCH & XCIH	21	13'69	10	9'74	
XCVI	XCIV & XCII	24	23'18	10	5'95	
"	XCH & XCV	25	62'47	10	20'97	
"	XCV & XCVII	22	36'55	10	5'74	
"	XCVII & XCIX	20	5'00	10	20'87	
XCVII	XCIX & XCVI	22	7'83	10	30'65	
"	XCVI & XCV	21	15'74	10	25'66	
"	XCV & XCVIII	21	8'83	10	16'36	
"	XCVIII & C	24	20'76	10	36'66	
"	C & CI	23	14'39	10	11'65	
"	CI & XCIX	21	20'00	10	14'80	
XCVIII	C & XCVII	23	21'93	10	7'74	
"	XCVII & XCV	23	31'98	10	8'98	
XCIX	XCVI & XCVII	20	5'14	10	19'32	
"	XCVII & CI	20	2'36	10	33'33	
C	CH & CHH	32	50'64	10	17'19	
"	CHH & CI	20	9'90	10	6'46	
"	CI & XCVII	21	6'88	10	9'87	
"	XCVII & XCVIII	21	8'77	10	20'77	
CI	XCIX & XCVII	21	8'97	10	8'81	
"	XCVII & C	20	5'22	10	4'33	
"	C & CH	22	20'15	10	33'50	
"	CH & CHH	20	3'84	10	42'29	
CH	CIV & CV	20	4'54	10	4'61	
"	CV & CHH	20	2'50	10	17'44	
"	CHH & CI	21	4'56	10	11'09	
"	CI & C	22	15'12	10	6'72	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
CIII	CI & C	21	9'40	10	5'48	
"	C & CII	21	8'21	10	7'89	
"	CII & CIV	21	5'34	10	6'48	
"	CIV & CV	21	6'82	10	13'29	
CIV	CVII & CVI	22	13'07	10	9'72	
"	CVI & CV	23	24'11	10	17'80	
"	CV & CIII	22	18'93	10	9'43	
"	CIII & CII	21	5'59	10	3'17	
CV	CIII & CII	24	27'17	10	4'02	
"	CII & CIV	21	11'31	10	3'54	
"	CIV & CVI	21	8'47	10	2'83	
"	CVI & CVIII	20	2'12	10	2'23	
CVI	CIV & CVII	20	3'46	10	2'28	
"	CVII & (XXIII)	20	4'70	10	4'01	
"	(XXIII) & (XXV)	20	6'78	10	8'42	
"	(XXV) & CIX	20	3'68	10	12'68	
"	CIX & CVIII	20	1'38	10	8'54	
"	CVIII & CV	20	2'24	10	6'40	
"	CV & CIV	20	1'40	10	3'88	
CVII	(XXIII) & CVI	20	2'92	10	9'07	
"	CVI & CIV	20	3'26	10	14'92	
CVIII	CV & CVI	20	4'90	10	17'17	
"	CVI & CIX	20	3'88	10	14'06	
CIX	CVIII & CVI	20	3'02	10	10'54	
"	CVI & (XXV)	20	5'02	10	4'54	
(XXIII)	(XXV) & CVI	21	10'97	10	14'70	
"	CVI & CVII	20	5'52	10	2'98	
(XXV)	CIX & CVI	21	6'09	10	5'02	
"	CVI & (XXIII)	20	3'32	10	10'07	

NOTE.—(XIII) and (XXXV) appertain to base-line figures.

From the preceding data of the sums of the squares of the apparent errors in the measurement of each angle, we may ascertain the *e. m. s.* (error of mean square) of *observation* of a single measure of an angle, and the *e. m. s. of graduation and observation*, of the mean of the measures on a single zero, for each group of angles measured by the same observer, and under similar circumstances, with Troughton's great theodolite which was employed throughout the whole of the operations.

The first 47 angles were measured at hill stations on 4 pairs of zeros, *face right* and *face left*, with an average of 3.14 observations on each zero; the remaining angles, 372 in number, were measured on 5 pairs of zeros with an average of 2.11 observations on each zero, at stations on hills, and sandhillocks and in the plains. The first 47 angles form a group by themselves; the remaining angles form 8 distinct groups, which again may be collected into 3 groups, in order that the relative *e. m. s.* of observations on hills and sandhillocks, and in the plains, may be shown.

$$\left. \begin{array}{l} \text{The } e. m. s. \text{ of observation of a single measure} \\ \text{of an angle} \end{array} \right\} = \sqrt{\frac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$$

$$\left. \begin{array}{l} \text{The } e. m. s. \text{ of graduation and observation of} \\ \text{the mean of the measures on a single zero} \end{array} \right\} = \sqrt{\frac{\text{Sum of squares of apparent errors of zero.}}{\text{No. of angles} \times (\text{No. of changes of zero} - 1).}}$$

Group.	Instrument and Observer.	Position of stations.	Intervals between microscope readings of circle.	Number of				<i>e. m. s.</i> of observation of a single measure.	<i>e. m. s.</i> of graduation and observation of a single zero.
				Measures on each zero (average).	Angles.	Single measures.	Single zeros.		
I	Troughton's 36" theodolite. Various observers.	Hills,	9° 0'	3.14	47	1181	376	$\left\{ \frac{574.28}{1181-376} \right\}^{\frac{1}{2}} = \pm 0''845$	$\left\{ \frac{227.50}{376-47} \right\}^{\frac{1}{2}} = \pm 0''832$
II	ditto	do.	7° 12'	2.06	28	578	280	$\left\{ \frac{184.43}{578-280} \right\}^{\frac{1}{2}} = \pm 0''787$	$\left\{ \frac{222.44}{280-28} \right\}^{\frac{1}{2}} = \pm 0''940$
III	Captain Strange.	do.	7° 12'	2.09	128	2676	1280	$\left\{ \frac{967.90}{2676-1280} \right\}^{\frac{1}{2}} = \pm 0''833$	$\left\{ \frac{1188.01}{1280-128} \right\}^{\frac{1}{2}} = \pm 1''016$
IV	Mr. Lanc.	do.	7° 12'	2.03	12	244	120	$\left\{ \frac{71.63}{244-120} \right\}^{\frac{1}{2}} = \pm 0''760$	$\left\{ \frac{109.28}{120-12} \right\}^{\frac{1}{2}} = \pm 1''006$
V	Captain Strange.	Sand hills	7° 12'	2.11	115	2423	1150	$\left\{ \frac{1187.97}{2423-1150} \right\}^{\frac{1}{2}} = \pm 0''966$	$\left\{ \frac{1126.64}{1150-115} \right\}^{\frac{1}{2}} = \pm 1''043$
VI	Various observers.	do.	7° 12'	2.06	17	350	170	$\left\{ \frac{128.17}{350-170} \right\}^{\frac{1}{2}} = \pm 0''844$	$\left\{ \frac{214.60}{170-17} \right\}^{\frac{1}{2}} = \pm 1''184$
VII	Mr. Lane.	Plains,	7° 12'	2.12	14	297	140	$\left\{ \frac{165.80}{297-140} \right\}^{\frac{1}{2}} = \pm 1''028$	$\left\{ \frac{118.03}{140-14} \right\}^{\frac{1}{2}} = \pm 0''968$
VIII	Captain Strange.	do.	7° 12'	2.17	30	650	300	$\left\{ \frac{548.34}{650-300} \right\}^{\frac{1}{2}} = \pm 1''252$	$\left\{ \frac{441.60}{300-30} \right\}^{\frac{1}{2}} = \pm 1''279$

Group.	Instrument and Observer.	Position of stations.	Intervals between microscope readings of circle.	Number of				<i>e. m. s.</i> of observation of a single measure.	<i>e. m. s.</i> of graduation and observation of a single zero.
				Measures on each zero (average).	Angles.	Single measures.	Single zeros.		
IX	Troughton's 36" theodolite. Various observers.	Plains,	7° 12'	2.24	28	627	280	$\left\{ \frac{551.24}{627-280} \right\}^{\frac{1}{2}} = \pm 1''260$	$\left\{ \frac{477.83}{280-28} \right\}^{\frac{1}{2}} = \pm 1''377$
II, III, & IV	ditto	Hills,	7° 12'	2.08	168	3498	1680	$\left\{ \frac{1223.96}{3498-1680} \right\}^{\frac{1}{2}} = \pm 0''821$	$\left\{ \frac{1519.73}{1680-168} \right\}^{\frac{1}{2}} = \pm 1''003$
V & VI	ditto	Sand hills	7° 12'	2.10	132	2773	1320	$\left\{ \frac{1316.14}{2773-1320} \right\}^{\frac{1}{2}} = \pm 0''952$	$\left\{ \frac{1341.24}{1320-132} \right\}^{\frac{1}{2}} = \pm 1''063$
VII, VIII, & IX	ditto	Plains,	7° 12'	2.19	72	1574	720	$\left\{ \frac{1265.38}{1574-720} \right\}^{\frac{1}{2}} = \pm 1''217$	$\left\{ \frac{1037.46}{720-72} \right\}^{\frac{1}{2}} = \pm 1''265$



OBSERVED ANGLES fixing KARACHI OBSERVATORY.

At (XXI)											
<i>May 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on Mutrani H.S.										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	208° 49'	
Mutrání H.S. & (XXII)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 11''00 <i>w</i> = 7.50 <i>r</i> = 0.13 <i>w</i> <i>C</i> = 41° 51' 11''00
	<i>h</i> 11.12	<i>h</i> 7.90	<i>h</i> 11.70	<i>l</i> 10.62	<i>l</i> 11.52	<i>l</i> 11.44	<i>l</i> 11.90	<i>l</i> 11.22	<i>l</i> 10.74	<i>l</i> 11.64	
	<i>h</i> 10.08	<i>h</i> 8.84	<i>l</i> 10.28	<i>l</i> 9.62	<i>l</i> 11.30	<i>l</i> 12.36	<i>l</i> 12.34	<i>l</i> 12.08	<i>l</i> 10.28	<i>l</i> 12.68	
	<i>h</i> 10.48	<i>h</i> 9.60	<i>l</i> 11.24	<i>l</i> 10.94	<i>l</i> 11.82	<i>l</i> 11.74	<i>l</i> 13.20	<i>l</i> 12.02	<i>l</i> 8.68	<i>l</i> 10.70	
	10.56	8.78	11.07	10.39	11.55	11.85	12.48	11.77	9.90	11.67	
At (XXII)											
<i>May 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XXI)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
(XXI) & Mutrání H.S.	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 34''34 <i>w</i> = 9.14 <i>r</i> = 0.11 <i>w</i> <i>C</i> = 59° 54' 34''34
	<i>h</i> 32.94	<i>h</i> 33.94	<i>h</i> 34.48	<i>h</i> 33.70	<i>h</i> 34.58	<i>h</i> 36.50	<i>l</i> 38.10	<i>l</i> 35.28	<i>l</i> 35.32	<i>l</i> 33.92	
	<i>h</i> 31.70	<i>h</i> 34.68	<i>h</i> 34.18	<i>h</i> 34.56	<i>h</i> 34.00	<i>h</i> 35.24	<i>l</i> 34.78	<i>l</i> 35.00	<i>l</i> 33.26	<i>l</i> 33.70	
	<i>h</i> 33.04	<i>h</i> 33.00	<i>h</i> 33.10	<i>h</i> 34.38	<i>h</i> 34.98	<i>h</i> 35.92	<i>l</i> 34.26	<i>l</i> 34.94	<i>l</i> 33.34	<i>l</i> 34.14	
	32.56	33.87	33.92	34.21	34.52	35.89	35.45	35.07	33.97	33.92	
Mutrání H.S. & A. H.S.	<i>h</i> 49.38	<i>h</i> 46.66	<i>h</i> 49.04	<i>h</i> 48.90	<i>h</i> 48.74	<i>h</i> 46.98	<i>l</i> 43.96	<i>l</i> 47.68	<i>l</i> 47.80	<i>l</i> 48.50	<i>M</i> = 47''74 <i>w</i> = 7.44 <i>r</i> = 0.13 <i>w</i> <i>C</i> = 54° 33' 47''74
	<i>h</i> 48.56	<i>h</i> 46.66	<i>h</i> 47.62	<i>h</i> 46.84	<i>h</i> 47.94	<i>h</i> 46.74	<i>l</i> 46.12	<i>l</i> 47.02	<i>l</i> 48.22	<i>l</i> 48.46	
	<i>h</i> 49.60	<i>h</i> 45.76	<i>h</i> 50.10	<i>h</i> 48.36	<i>h</i> 48.72	<i>h</i> 48.08	<i>l</i> 46.76	<i>l</i> 46.42	<i>l</i> 48.30	<i>l</i> 48.30	
		<i>h</i> 48.44				<i>l</i> 46.18					
	49.18	46.36	48.80	48.03	48.47	47.27	45.76	47.04	48.11	48.42	

NOTE.—(XXI) and (XXII) appertain to base-line figures.

KARACHI LONGITUDINAL SERIES.

OBSERVED ANGLES fixing KARACHI OBSERVATORY.

At MUTRANI H.S.											
<i>May 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on Karachi observatory										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 14'	187° 14'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	208° 49'	
Karachi observatory & A: H.S.	<i>h</i> 46° 04	<i>h</i> 46° 32	<i>l</i> 45° 28	<i>l</i> 46° 08	<i>l</i> 47° 52	<i>l</i> 47° 00	<i>h</i> 47° 06	<i>h</i> 47° 10	<i>h</i> 46° 12	<i>h</i> 44° 12	<i>M</i> = 46'' 33 <i>w</i> = 9 80 $\frac{1}{w}$ = 0 10 <i>C</i> = 71° 5' 46'' 33
	<i>h</i> 45° 84	<i>l</i> 45° 88	<i>l</i> 45° 42	<i>l</i> 48° 06	<i>l</i> 46° 74	<i>l</i> 48° 26	<i>h</i> 46° 24	<i>h</i> 44° 52	<i>h</i> 46° 42	<i>h</i> 46° 14	
	<i>h</i> 44° 90	<i>l</i> 46° 44	<i>l</i> 46° 50	<i>l</i> 45° 48	<i>l</i> 47° 50	<i>l</i> 47° 74	<i>h</i> 45° 70	<i>h</i> 46° 68	<i>h</i> 46° 22	<i>h</i> 42° 62	
			<i>l</i> 47° 60							<i>h</i> 46° 34	
	45° 59	46° 21	45° 73	47° 03	47° 25	47° 97	46° 33	46° 10	46° 25	44° 81	
A: H.S. & (XXII)	<i>h</i> 39° 24	<i>h</i> 36° 10	<i>l</i> 39° 54	<i>l</i> 39° 30	<i>l</i> 38° 36	<i>l</i> 37° 08	<i>l</i> 40° 18	<i>l</i> 39° 80	<i>l</i> 38° 00	<i>l</i> 40° 24	<i>M</i> = 38'' 89 <i>w</i> = 10 40 $\frac{1}{w}$ = 0 10 <i>C</i> = 40° 4' 38'' 89
	<i>h</i> 39° 10	<i>h</i> 37° 52	<i>l</i> 39° 00	<i>l</i> 39° 24	<i>l</i> 37° 82	<i>l</i> 38° 00	<i>l</i> 40° 08	<i>l</i> 38° 00	<i>l</i> 39° 94	<i>l</i> 39° 30	
	<i>h</i> 39° 46	<i>l</i> 36° 92	<i>l</i> 39° 22	<i>l</i> 40° 24	<i>l</i> 39° 24	<i>l</i> 38° 54	<i>l</i> 38° 66	<i>l</i> 39° 48	<i>l</i> 39° 26	<i>l</i> 39° 92	
	39° 27	36° 85	39° 25	39° 59	38° 47	37° 87	39° 64	39° 09	39° 07	39° 82	
(XXII) & (XXI)	<i>h</i> 12° 42	<i>h</i> 14° 66	<i>l</i> 14° 44	<i>l</i> 13° 34	<i>l</i> 12° 26	<i>l</i> 15° 08	<i>l</i> 12° 44	<i>l</i> 12° 66	<i>l</i> 13° 74	<i>l</i> 13° 34	<i>M</i> = 13'' 37 <i>w</i> = 9 80 $\frac{1}{w}$ = 0 10 <i>C</i> = 78° 14' 13'' 37
	<i>h</i> 12° 84	<i>h</i> 15° 80	<i>l</i> 14° 18	<i>l</i> 12° 52	<i>l</i> 13° 12	<i>l</i> 14° 60	<i>l</i> 12° 26	<i>l</i> 13° 10	<i>l</i> 13° 50	<i>l</i> 13° 66	
	<i>h</i> 12° 94	<i>l</i> 14° 62	<i>l</i> 13° 90	<i>l</i> 11° 70	<i>l</i> 11° 60	<i>l</i> 13° 88	<i>l</i> 13° 16	<i>l</i> 11° 58	<i>l</i> 13° 92	<i>l</i> 13° 94	
	12° 73	15° 03	14° 17	12° 52	12° 33	14° 52	12° 62	12° 45	13° 72	13° 65	
At A: H.S.											
<i>May 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XXII)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
(XXII) & Mutrani H.S.	<i>h</i> 29° 90	<i>h</i> 32° 18	<i>h</i> 31° 74	<i>h</i> 34° 06	<i>h</i> 32° 20	<i>l</i> 34° 10	<i>l</i> 34° 46	<i>l</i> 34° 62	<i>l</i> 34° 86	<i>l</i> 34° 74	<i>M</i> = 32'' 91 <i>w</i> = 4 90 $\frac{1}{w}$ = 0 20 <i>C</i> = 85° 21' 32'' 91
	<i>h</i> 30° 12	<i>h</i> 31° 52	<i>h</i> 31° 44	<i>h</i> 34° 48	<i>l</i> 32° 66	<i>l</i> 32° 82	<i>l</i> 33° 76	<i>l</i> 31° 86	<i>l</i> 34° 64	<i>l</i> 33° 66	
	<i>h</i> 31° 30	<i>h</i> 30° 16	<i>h</i> 32° 26	<i>h</i> 33° 10	<i>l</i> 33° 22	<i>l</i> 33° 06	<i>l</i> 34° 80	<i>l</i> 31° 42	<i>l</i> 34° 32	<i>l</i> 33° 48	
								<i>l</i> 33° 18			
	30° 44	31° 29	31° 81	33° 88	32° 69	33° 33	34° 34	32° 77	34° 61	33° 96	

NOTE.—(XXI) and (XXII) appertain to base-line figures.



OBSERVED ANGLES fixing KARACHI OBSERVATORY.

At A : H.S.—(Continued.)											
<i>May 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XXII)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
Mutráni H.S. & Karáchi observatory	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 24''·61 <i>w</i> = 22·87 $\frac{1}{w}$ = 0·04 <i>C</i> = 46° 12' 24''·61
	<i>h</i> 25·64	<i>h</i> 24·90	<i>h</i> 24·22	<i>h</i> 24·46	<i>h</i> 23·58	<i>l</i> 24·72	<i>l</i> 24·74	<i>l</i> 24·88	<i>l</i> 24·20	<i>l</i> 23·34	
	<i>h</i> 25·34	<i>h</i> 24·82	<i>h</i> 23·82	<i>h</i> 23·42	<i>l</i> 23·80	<i>l</i> 24·92	<i>l</i> 24·36	<i>l</i> 24·64	<i>l</i> 25·60	<i>l</i> 24·40	
	<i>h</i> 25·04	<i>h</i> 25·94	<i>h</i> 24·62	<i>h</i> 23·72	<i>l</i> 24·18	<i>l</i> 24·82	<i>l</i> 24·92	<i>l</i> 27·40	<i>l</i> 24·00	<i>l</i> 24·92	
	25·34	25·22	24·22	23·87	23·85	24·82	24·67	25·28	24·60	24·22	
At KARACHI OBSERVATORY											
<i>May 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on A : H.S.										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	338° 59'	158° 59'	346° 11'	166° 11'	353° 23'	173° 23'	0° 35'	180° 35'	7° 47'	187° 47'	
A : H.S. & Mutráni H.S.	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 48''·96 <i>w</i> = 10·45 $\frac{1}{w}$ = 0·10 <i>C</i> = 62° 41' 48''·96
	<i>h</i> 49·88	<i>h</i> 49·30	<i>h</i> 46·76	<i>h</i> 48·60	<i>h</i> 48·12	<i>h</i> 48·54	<i>h</i> 49·56	<i>h</i> 48·62	<i>l</i> 47·70	<i>l</i> 49·50	
	<i>h</i> 50·16	<i>h</i> 50·08	<i>h</i> 48·14	<i>h</i> 49·64	<i>h</i> 47·68	<i>h</i> 48·54	<i>h</i> 49·02	<i>h</i> 48·66	<i>l</i> 47·84	<i>l</i> 49·44	
	<i>h</i> 50·72	<i>h</i> 50·20	<i>h</i> 48·82	<i>h</i> 49·96	<i>h</i> 47·36	<i>h</i> 47·08	<i>h</i> 50·38	<i>l</i> 51·20	<i>l</i> 49·14	<i>l</i> 47·62	
	50·25	49·86	48·09	49·40	47·72	48·05	49·65	49·49	48·23	48·85	



**PRINCIPAL TRIANGULATION.**

**REDUCTION OF FIGURES.**

**KARACHI LONGITUDINAL SERIES.**

Figure No. 10.

Observed Angles				Equations to be satisfied						Factor		
No.	Value			Reciprocal Weight	$x_1$	$+x_4$	$+x_5$	$=e_1 = -1.76,$	$\lambda_1$			
	°	'	"		$x_3$	$+x_6$	$+x_{10}$	$=e_2 = +1.29,$	$\lambda_2$			
					$x_7$	$+x_9$	$+x_{12}$	$=e_3 = +.72,$	$\lambda_3$			
					$x_2$	$+x_8$	$+x_{13}$	$=e_4 = +.10,$	$\lambda_4$			
					$x_5 + x_6 + x_7 + x_8 - x_{11} - x_{14}$			$=e_5 = -1.08,$	$\lambda_5$			
					$+ .86 x_1 - .98 x_4 + 1.00 x_3 - 1.13 x_{10} + .33 x_9$			$=e_6 = +3.306,$	$\lambda_6$			
					$-.65 x_{12} + .57 x_{11} - .55 x_{14} + 1.00 x_{13} - .50 x_2$							
1	49	10	1.32	.22	Equations between the factors							
2	63	38	22.88	.12								
3	45	4	55.23	.09								
4	45	32	9.17	.06								
5	85	17	48.77	.26								
6	93	21	35.17	.18								
7	51	25	46.53	.13								
8	71	29	16.65	.32								
9	71	31	36.54	.07								
10	41	33	32.05	.16								
11	60	25	11.99	.15								
12	57	2	38.75	.14								
13	44	52	21.74	.04								
14	61	9	17.55	.11								
					No. of e	Value of e	Co-efficients of					
							$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$
					1	-1.76	+ .54				+ .26	+ .1304
					2	+ 1.29		+ .43			+ .18	- .0908
					3	+ .72			+ .34		+ .13	- .0679
					4	+ .10		*		+ .48	+ .32	- .0200
					5	- 1.08					+ 1.15	- .0250
					6	+ 3.306						+ .7334
Values of the Factors												
Factor	SYMBOLICAL						Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$						
$\lambda_1 =$	+ 2.282	+ .217	+ .196	+ .456	- .707	- .372	- 4.0174	0.6039451				
$\lambda_2 =$		+ 2.643	+ .292	+ .416	- .605	+ .306	+ 4.9467	0.6943156				
$\lambda_3 =$			+ 3.211	+ .381	- .553	+ .290	+ 3.9382	0.5952978				
$\lambda_4 =$				+ 2.732	- .970	+ .047	+ 1.4856	0.1719019				
$\lambda_5 =$		*			+ 1.457	+ .023	- 1.5290	0.1844075				
$\lambda_6 =$						+ 1.497	+ 6.1879	0.7915433				
Adopted angular errors in seconds												
$x_1 = + .29$	$x_4 = - .61$	$x_7 = + .31$	$x_{10} = - .32$	$x_{13} = + .30$								
$x_2 = - .18$	$x_5 = - 1.44$	$x_8 = - .02$	$x_{11} = + .76$	$x_{14} = - .21$								
$x_3 = + .99$	$x_6 = + .62$	$x_9 = + .42$	$x_{12} = - .01$									
$[wx^2] = 38.60$												

Figure No. 11.

Observed Angles					Equations to be satisfied								Factor					
No.	Value			Reciprocal Weight	$x_2$	$+ x_3$	$+ x_5$	$= e_1 = -$	$\cdot 39,$	$\lambda_1$								
					$x_1$	$+ x_6$	$+ x_{11}$	$= e_2 = -$	$\cdot 93,$	$\lambda_2$								
					$x_7$	$+ x_{10}$	$+ x_{15}$	$= e_3 = +$	$\cdot 79,$	$\lambda_3$								
					$x_8$	$+ x_{13}$	$+ x_{14}$	$= e_4 = +$	$\cdot 12,$	$\lambda_4$								
					$x_4$	$+ x_9$	$+ x_{12}$	$= e_5 = +$	$\cdot 49,$	$\lambda_5$								
					$x_5$	$+ x_8$	$+ x_9$	$= e_6 = -$	$\cdot 06,$	$\lambda_6$								
					$+ 1\cdot07x_3$	$- \cdot 81x_2$	$+ \cdot 15x_1$	$- 1\cdot16x_{11}$	$+ \cdot 65x_{10}$									
					$- 1\cdot06x_{15}$	$+ \cdot 63x_{14}$	$- \cdot 50x_{13}$	$+ 1\cdot34x_{12}$	$- \cdot 44x_4$									
								$= e_7 = -$	$1\cdot66,$	$\lambda_7$								
Equations between the factors																		
				Co-efficients of														
				No. of e	Value of e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$						
1	81	12	39 <sup>o</sup> 55'	10	-	0.39	+ 0.22				+ 0.06	+ 0.021						
2	50	53	53 <sup>o</sup> 63'	08	-	0.93		+ 0.30			+ 0.07	- 0.136						
3	42	59	49 <sup>o</sup> 90'	08	+	0.79			+ 0.20		+ 0.06	- 0.028						
4	66	9	58 <sup>o</sup> 97'	08	+	0.12				+ 0.17	+ 0.07	- 0.016						
5	86	6	16 <sup>o</sup> 88'	06	+	0.49		*			+ 0.08	+ 0.086						
6	57	57	49 <sup>o</sup> 96'	07	-	0.06				+ 0.25	+ 0.34							
7	79	49	13 <sup>o</sup> 36'	06	-	1.66						+ 0.637						
8	58	57	20 <sup>o</sup> 05'	07														
9	77	9	19 <sup>o</sup> 69'	08														
10	56	52	16 <sup>o</sup> 12'	07														
11	40	49	30 <sup>o</sup> 06'	13														
12	36	40	43 <sup>o</sup> 18'	09														
13	63	25	46 <sup>o</sup> 70'	07														
14	57	36	55 <sup>o</sup> 30'	03														
15	43	18	33 <sup>o</sup> 23'	07														
Values of the Factors																		
Factor	Symbolical							Numerical	Logarithmic									
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$											
$\lambda_1 =$	+ 4.875	+ 0.201	+ 0.325	+ 0.461	+ 0.421	- 1.154	- 0.149	- 1.255	0.0986437									
$\lambda_2 =$		+ 3.969	+ 0.434	+ 0.510	+ 0.034	- 1.040	+ 0.869	- 4.730	0.6748611									
$\lambda_3 =$			+ 5.429	+ 0.560	+ 0.313	- 1.293	+ 0.292	+ 3.570	0.5526682									
$\lambda_4 =$				+ 6.630	+ 0.490	- 1.766	+ 0.218	+ 0.571	1.7566361									
$\lambda_5 =$					+ 4.634	- 1.328	- 0.609	+ 3.472	0.5405797									
$\lambda_6 =$			*			+ 4.262	- 0.103	- 0.551	1.7411516									
$\lambda_7 =$							+ 1.865	- 3.880	0.5888317									
Adopted angular errors in seconds																		
$x_1 = -$	53	$x_4 = +$	41	$x_7 = +$	18	$x_{10} = +$	07	$x_{13} = +$	18									
$x_2 = +$	15	$x_5 = -$	11	$x_8 =$	00	$x_{11} = -$	03	$x_{14} = -$	06									
$x_3 = -$	43	$x_6 = -$	37	$x_9 = +$	24	$x_{12} = -$	16	$x_{15} = +$	54									
$[wx^2] = 15.95$																		



Figure No. 13.

Observed Angles				Equations to be satisfied							Factor
No.	Value			Reciprocal Weight							
	°	'	"		$-x_1$	$-x_2$	$+x_5$	$+x_6$	$=e_1 = +0.27,$	$\lambda_1$	
1	37	16	53.04	.21	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = +0.45,$	$\lambda_2$	
2	42	8	16.16	.08	$x_1$	$+x_2$	$+x_3$	$+x_4 +$	} $=e_3 = -0.50,$	$\lambda_3$	
3	42	51	49.35	.05	$+x_5$	$+x_6$	$+x_7$	$+x_8$			
4	57	43	3.60	.09	$1.31 x_1$	$-1.11 x_2$	$+1.08 x_3$	$-0.63 x_4 +$	} $=e_4 = -1.09,$	$\lambda_4$	
5	48	14	7.49	.13	$+0.89 x_5$	$-1.65 x_6$	$+0.88 x_7$	$-0.79 x_8$			
6	31	11	1.77	.08							
7	48	43	26.24	.11							
8	51	51	26.84	.12							

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	+0.27	+0.50		-0.08	-0.202	$\lambda_1 =$	+2.1842	+0.360	+0.1254	+0.4063	+0.102	$\bar{1}^{\circ}0086002$
2	+0.45		+0.37	-0.09	-0.005	$\lambda_2 =$		+2.7743	+0.2954	-0.275	+0.141	$0^{\circ}0572856$
3	-0.50	*		+0.87	+0.169	$\lambda_3 =$	*		+1.2261	-0.1753	-0.256	$\bar{1}^{\circ}4082400$
4	-1.09				+0.034	$\lambda_4 =$				+1.0753	-0.987	$\bar{1}^{\circ}9943172$

Adopted angular errors in seconds

$x_1 = -0.34$	$x_5 = -0.13$
$x_2 = +0.05$	$x_6 = +0.11$
$x_3 = -0.00$	$x_7 = -0.24$
$x_4 = +0.13$	$x_8 = -0.08$

$[wx^2] = 1.75$

PRINCIPAL TRIANGULATION—REDUCTION OF FIGURES.

Figure No. 14.

Observed Angles					Equations to be satisfied					Factor	
No.	Value			Reciprocal Weight						"	
	°	'	"		$x_1$	$+ x_2$	$- x_5$	$- x_8$	$= e_1 = - 1.27,$	$\lambda_1$	
1	26	24	32.77	.14	$x_8$	$+ x_4$	$- x_7$	$- x_8$	$= e_2 = + 3.21,$	$\lambda_2$	
2	58	11	14.40	.14	$x_1$	$+ x_2$	$+ x_3$	$+ x_4 +$	} $= e_3 = - .72,$	$\lambda_3$	
3	55	32	56.93	.24	$+ x_5$	$+ x_6$	$+ x_7$	$+ x_8$			
4	39	51	18.34	.10	$2.01 x_1$	$- .62 x_2$	$+ .69 x_3$	$- 1.20 x_4 +$	} $= e_4 = - 2.04,$	$\lambda_4$	
5	47	44	31.13	.12	$+ .91 x_5$	$- 1.33 x_6$	$+ .74 x_7$	$- 1.11 x_8$			
6	36	51	17.38	.23							
7	53	29	28.52	.16							
8	41	54	44.53	.20							

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-1.27	+ .63		- .07	+ .391	$\lambda_1 =$	+ 1.8627	+ .0941	+ .0795	- .4295	- 1.246	0.0955180
2	+ 3.21		+ .70	- .02	+ .150	$\lambda_2 =$		+ 1.4609	+ .0204	- .1481	+ 4.857	0.6863681
3	- 0.72		*	+ 1.33	- .061	$\lambda_3 =$		*	+ .7571	+ .0076	- 0.596	1.7752463
4	- 2.04				+ 1.718	$\lambda_4 =$				+ .6930	- 1.349	0.1300119

Adopted angular errors in seconds

$x_1 = - .63$	$x_5 = - .07$
$x_2 = - .14$	$x_6 = + .56$
$x_3 = + .80$	$x_7 = - 1.03$
$x_4 = + .59$	$x_8 = - .80$

$[wx^2] = 20.37$



Figure No. 15.

Observed Angles				Equations to be satisfied								Factor				
No.	Value			Reciprocal Weight												
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$= e_1 = -1.62,$	$\lambda_1$						
1	59	9	37.09	.19	$x_3$	$+x_4$	$-x_7$	$-x_8$	$= e_2 = +1.49,$	$\lambda_2$						
2	25	28	10.63	.06	$x_1$	$+x_2$	$+x_3$	$+x_4$	} $= e_3 = -1.13,$	$\lambda_3$						
3	47	34	7.87	.15	$+x_5$	$+x_6$	$+x_7$	$+x_8$								
4	47	48	6.68	.03	$.60x_1$	$-2.10x_2$	$+ .91x_3$	$- .91x_4$	} $= e_4 = -0.71,$	$\lambda_4$						
5	31	23	20.26	.05	$+1.64x_5$	$-.75x_6$	$+1.21x_7$	$-.68x_8$								
6	53	14	29.36	.03												
7	39	41	24.90	.11												
8	55	40	46.86	.08												

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-1.62	+ .33		+ .17	- .071	$\lambda_1 =$	+ 3.7518	- .0848	- 1.1307	+ .6459	- 5.385	0.7311857
2	+1.49		+ .37	- .01	+ .031	$\lambda_2 =$		+ 2.7173	+ .1065	- .1393	+ 4.165	0.6196150
3	-1.13		*	+ .70	+ .236	$\lambda_3 =$		*	+ 1.9247	- .6493	+ .275	1.4393327
4	-0.71				+ .831	$\lambda_4 =$				+ 1.4493	- 1.548	0.1897710

Adopted angular errors in seconds

$x_1 = -1.15$	$x_5 = +0.16$
$x_2 = -.10$	$x_6 = +.21$
$x_3 = +.44$	$x_7 = -.64$
$x_4 = +.18$	$x_8 = -.23$

$[wx^2] = 15.72$

PRINCIPAL TRIANGULATION—REDUCTION OF FIGURES.

Figure No. 16.

OBSERVED ANGLES														
No.	Value			Reciprocal Weight	No.	Value			Reciprocal Weight	No.	Value			Reciprocal Weight
	°	'	"			°	'	"			°	'	"	
*1	58	42	44.30	.26	12	49	28	17.76	.26	23	79	54	36.32	1.82
2	63	37	14.40	.26	13	37	49	32.09	.26	24	11	37	25.05	.40
3	74	13	5.41	.26	14	46	37	48.52	.26	25	61	52	50.81	.40
4	55	37	4.03	.26	15	43	37	12.84	.26	26	54	47	15.71	1.82
5	42	9	42.46	.26	16	42	34	43.81	1.82	27	45	26	35.20	1.82
6	51	18	21.56	.26	17	30	13	38.55	1.82	28	49	43	38.04	.40
7	101	52	18.67	.26	18	43	59	28.86	1.82	29	86	56	44.86	1.82
8	86	54	29.17	.26	19	57	13	29.76	1.82	30	48	23	43.81	1.82
9	77	45	7.80	.26	20	80	36	49.02	1.82	31	30	34	4.22	.40
10	40	18	11.68	.26	21	55	25	24.63	1.82	32	9	44	8.69	.40
11	69	58	56.36	.26	22	58	50	37.73	1.82					

Equations to be satisfied

Factor

$x_1 + x_{11} + x_6$	..	..	..	..	..	..	..	..	..	= $e_1 = +0.87$ ,	$\lambda_1$
$x_{10} + x_7 + x_{13}$	..	..	..	..	..	..	..	..	..	= $e_2 = +0.82$ ,	$\lambda_2$
$x_8 + x_{13} + x_{15}$	..	..	..	..	..	..	..	..	..	= $e_3 = -2.16$ ,	$\lambda_3$
$x_9 + x_{14} + x_4$	..	..	..	..	..	..	..	..	..	= $e_4 = -1.48$ ,	$\lambda_4$
$x_2 + x_3 + x_5$	..	..	..	..	..	..	..	..	..	= $e_5 = +1.08$ ,	$\lambda_5$
$x_5 + x_{42} + x_{18} + x_{34}$	..	..	..	..	..	..	..	..	..	= $e_6 = +1.49$ ,	$\lambda_6$
$x_{41} + x_{33} + x_{30}$	..	..	..	..	..	..	..	..	..	= $e_7 = -5.79$ ,	$\lambda_7$
$x_{40} + x_{29} + x_{27}$	..	..	..	..	..	..	..	..	..	= $e_8 = -0.57$ ,	$\lambda_8$
$x_{38} + x_{26} + x_{23}$	..	..	..	..	..	..	..	..	..	= $e_9 = -1.04$ ,	$\lambda_9$
$x_{37} + x_{22} + x_{21}$	..	..	..	..	..	..	..	..	..	= $e_{10} = -8.02$ ,	$\lambda_{10}$
$x_{36} + x_{20} + x_{19}$	..	..	..	..	..	..	..	..	..	= $e_{11} = -3.15$ ,	$\lambda_{11}$
$x_{16} + x_2 + x_{17} + x_{35}$	..	..	..	..	..	..	..	..	..	= $e_{12} = -3.30$ ,	$\lambda_{12}$
$x_{39} + x_{24} + x_{25} + x_{28}$	..	..	..	..	..	..	..	..	..	= $e_{13} = +2.32$ ,	$\lambda_{13}$
$x_{31} + x_{13} + x_{28} + x_{25}$	..	..	..	..	..	..	..	..	..	= $e_{14} = +2.85$ ,	$\lambda_{14}$
$x_{17} + x_{18} - x_3$	..	..	..	..	..	..	..	..	..	= $e_{15} = +2.00$ ,	$\lambda_{15}$
$x_{31} + x_{32} - x_{10}$	..	..	..	..	..	..	..	..	..	= $e_{16} = +1.23$ ,	$\lambda_{16}$
$x_{43} + x_{41} + x_{40} + x_{38} - x_6 - x_7 - x_{39}$	..	..	..	..	..	..	..	..	..	= $e_{17} = -2.16$ ,	$\lambda_{17}$
$x_{42} + x_{41} + x_{40} + x_{38} + x_{37} + x_{36} + x_5$	..	..	..	..	..	..	..	..	..	= $e_{18} = -0.20$ ,	$\lambda_{18}$
$x_5 + x_6 + x_7 + x_8 + x_9$	..	..	..	..	..	..	..	..	..	= $e_{19} = -0.34$ ,	$\lambda_{19}$
$+ .28 x_3 - .50 x_2 + .94 x_{14} - .68 x_4 + .85 x_{13} - 1.049 x_{15} + 1.179 x_{10} - 1.288 x_{13}$										= $e_{20} = +3.012$ ,	$\lambda_{20}$
$+ .17 x_{20} - .64 x_{19} + .60 x_{22} - .69 x_{21} + .71 x_{26} - .18 x_{23} + .05 x_{29} - .98 x_{27}$										= $e_{21} = -2.038$ ,	$\lambda_{21}$
$+ 1.051 x_{35} + .29 x_{16} + .29 x_2 + .34 x_5 + .34 x_{42} - .47 x_{34} + .50 x_2 - 1.104 x_5$										= $e_{22} = -5.068$ ,	$\lambda_{22}$
$+ .66 x_{39} - .30 x_{24} - .30 x_{25} + 1.179 x_{10} + .21 x_7 + .53 x_{25} - 1.693 x_{31}$										= $e_{23} = -0.423$ ,	$\lambda_{23}$
$+ .28 x_3 - .50 x_2 + .17 x_{20} - .64 x_{19} + .60 x_{22} - .69 x_{21} + 5.82837 x_{32}$										= $e_{24} = +2.717$ ,	$\lambda_{24}$
$- 4.86146 x_{24} + .61 x_1 - .36 x_{11}$											

\* The angles numbered 1 to 15 appertain to the Karachi Longitudinal Series, those numbered 16 to 42 are taken from the Gurbahgarh Meridional Series.

NOTE.—The Weights here employed are not the Preliminary Weights, as in the reduction of all other figures, but Final or Absolute Weights resulting from the analysis which is described at page 352 of Vol. II, and of which the details are given at page vii of Vol. IV.

Figure No. 16—(Continued.)

No. of e	Value of e	Equations between the factors											
		CO-EFFICIENTS OF											
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$
1	+0.87	+0.78											
2	+0.82		+0.78										
3	-2.16			+0.78									
4	-1.48				+0.78								
5	+1.08					+0.78	+0.26						+0.26
6	+1.49						+5.72						
7	-5.79							+5.46					
8	-0.57								+5.46				
9	-1.04									+5.46			
10	-8.02										+5.46		
11	-3.15											+5.46	
12	-3.30												+5.72
13	+2.32												+1.60
14	+2.85						*						
15	+2.00												
16	+1.23												
17	-2.16												
18	-0.20												
19	-0.34												
20	+3.012												
21	-2.038												
22	-5.068												
23	-0.423												
24	+2.717												

No. of e	CO-EFFICIENTS OF										
	$\lambda_{14}$	$\lambda_{15}$	$\lambda_{16}$	$\lambda_{17}$	$\lambda_{18}$	$\lambda_{19}$	$\lambda_{20}$	$\lambda_{21}$	$\lambda_{22}$	$\lambda_{23}$	$\lambda_{24}$
1				-0.26		+0.26	+0.0650				+0.0650
2	+0.26		-0.26	-0.26		+0.26	-0.0283			+0.3611	
3						+0.26	-0.0517				
4						+0.26	+0.0676				
5		-0.26			+0.26	+0.26	-0.0572				
6		+1.82		+1.82	+2.08	+0.26		+0.0068			-0.0572
7				+1.82	+1.82		+1.0301	-0.4352			
8				+1.82	+1.82		+0.3021				
9				+1.82	+1.82		-1.6926				
10					+1.82		+0.9646				
11					+1.82		-1.1638				-0.1638
12		+1.82					-0.8554				-0.8554
13	+0.80			-0.40			-0.1300		+2.6460		-0.1300
14	+1.46		+0.40						+0.2360	-1.9446	
15		+3.90							-0.5852		
16			+1.06								-0.0728
17				+8.20	+7.28	-0.52					+2.3314
18					+11.18	+0.26			+0.6188	-0.3186	
19						+1.30			+0.4202		
20							+1.8325		-1.1986	+0.0546	
21								+10.8753	-1.1027	+0.3614	+0.2158
22			*						+0.4020		+2.3198
23									+3.0899		-1.1027
24										+1.7508	+0.5834
											+2.5771

Equations between the factors—(Continued.)

Figure No. 16—(Continued.)

Values of the Factors													
Factor	SYMBOLICAL												
	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	e <sub>4</sub>	e <sub>5</sub>	e <sub>6</sub>	e <sub>7</sub>	e <sub>8</sub>	e <sub>9</sub>	e <sub>10</sub>	e <sub>11</sub>	e <sub>12</sub>	e <sub>13</sub>
λ <sub>1</sub> =	+1'4407	+ '2764	+ '1198	+ '1277	+ '1313	- '0050	- '0143	- '0124	- '0149	+ '0166	+ '0166	+ '0184	+ '0778
λ <sub>2</sub> =		3'1116	'1619	'2037	'3131	'0813	'0140	'0640	+ '0026	'0595	'1110	- '0542	2'5608
λ <sub>3</sub> =			1'4356	'1462	'1226	+ '0173	+ '0065	+ '0068	'0064	- '0216	- '0232	+ '0074	- '0274
λ <sub>4</sub> =				1'4377	'1207	'0177	'0067	'0041	'0076	'0193	'0176	'0040	+ '0967
λ <sub>5</sub> =					1'6777	- '1382	'0036	- '0236	'0127	+ '0172	+ '0183	- '2744	'3311
λ <sub>6</sub> =						+ '2607	'0275	+ '0297	'0267	'0048	'0050	+ '0579	- '0377
λ <sub>7</sub> =							'2066	'0199	'0246	'0026	'0024	- '0122	+ '0019
λ <sub>8</sub> =								'2196	'0144	'0035	'0051	+ '0181	- '1298
λ <sub>9</sub> =					*				'2111	'0022	'0015	- '0223	+ '0456
λ <sub>10</sub> =										'2244	'0444	+ '0019	'1139
λ <sub>11</sub> =											'2364	'0043	'2460
λ <sub>12</sub> =												'4790	- '1898
λ <sub>13</sub> =													+ 5'9137
λ <sub>14</sub> =													
λ <sub>15</sub> =													
λ <sub>16</sub> =													
λ <sub>17</sub> =													
λ <sub>18</sub> =													
λ <sub>19</sub> =													
λ <sub>20</sub> =													
λ <sub>21</sub> =													
λ <sub>22</sub> =													
λ <sub>23</sub> =													
λ <sub>24</sub> =													

Factor	SYMBOLICAL											Numerical	Logarithmic
	e <sub>14</sub>	e <sub>15</sub>	e <sub>16</sub>	e <sub>17</sub>	e <sub>18</sub>	e <sub>19</sub>	e <sub>20</sub>	e <sub>21</sub>	e <sub>22</sub>	e <sub>23</sub>	e <sub>24</sub>		
λ <sub>1</sub> =	- '1224	- '0011	+ '0963	+ '0919	- '0500	- '3696	- '0516	+ '0052	- '0547	- '0032	- '0057	+ 0'9664	1'9851688
λ <sub>2</sub> =	2'6673	+ '1258	- 2'7445	'2066	'1418	'5401	'2733	- '1367	+ '0131	+ 3'4910	+ '5435	- 0'8012	1'9037654
λ <sub>3</sub> =	'0261	- '0031	+ '1106	- '0832	+ '0636	'4511	+ '0482	+ '0010	- '0241	'0174	+ '0141	2'2160	0'3455748
λ <sub>4</sub> =	'1364	+ '0007	- '1053	'0781	'0591	'4509	- '0621	- '0073	'0230	- '1541	+ '0208	1'7772	0'2497262
λ <sub>5</sub> =	'3029	'3422	'4011	+ '0524	- '0510	'3654	+ '0123	'0744	+ '1976	'4451	'0831	+ 1'9404	0'2878879
λ <sub>6</sub> =	+ '0265	- '1610	+ '0055	- '0692	'0142	'0524	- '0030	+ '0062	- '0012	+ '0120	- '0044	- 0'4825	1'6834953
λ <sub>7</sub> =	'0002	'0021	- '0667	'0609	'0078	'0198	'0018	- '0096	+ '0278	- '0084	'0084	1'2488	0'0964947
λ <sub>8</sub> =	'1034	'0460	+ '1702	'0578	'0095	'0169	+ '0179	+ '0453	- '0059	+ '1583	- '0331	0'3466	1'5397733
λ <sub>9</sub> =	- '0340	+ '0125	- '1455	'0620	'0072	'0207	- '0083	- '0279	+ '0389	- '1161	+ '0222	0'3610	1'5574777
λ <sub>10</sub> =	'0891	- '0031	'0934	+ '1135	'1217	+ '0618	'0149	+ '0026	- '0033	'0954	'0221	2'0868	0'3194818
λ <sub>11</sub> =	'1931	'0061	'3229	'1186	'1270	'0624	'0369	'0073	'0056	'2956	'0627	1'3681	0'1361281
λ <sub>12</sub> =	+ '1433	'3097	+ '3750	'0269	'0040	- '0177	+ '0220	'0829	'4196	+ '3176	- '0642	0'3128	1'4952695
λ <sub>13</sub> =	- 4'7584	+ '3135	- 7'9989	'3021	'2479	'0792	- '8110	- '3603	+ '1912	- 7'6530	+ 1'4030	'39191	0'5931850
λ <sub>14</sub> =	+ 4'8270	- '2431	+ 6'0982	- '2410	+ '1934	+ '2217	+ '7211	+ '2824	- '1315	+ 6'3995	- 1'1032	+ 5'1992	0'7159361
λ <sub>15</sub> =		+ '5584	- '5375	+ '0191	'0072	'0045	- '0249	- '1203	+ '2553	- '4751	+ '0964	1'1145	0'0470973
λ <sub>16</sub> =			+ 16'0787	- '0245	'1171	+ '0510	+ 1'4106	+ '6487	- '4531	+ 13'2429	- 2'4605	8'8009	0'9445269
λ <sub>17</sub> =				+ '5183	- 3'370	+ '2429	'0327	'0086	'0764	- '0946	+ '0313	- 1'1412	0'0573495
λ <sub>18</sub> =					+ '3612	- '1850	+ '0290	- '0046	+ '0084	+ '1441	- '0376	+ 1'7307	0'2382237
λ <sub>19</sub> =						+ 1'3530	- '0012	+ '0078	'0709	'1709	'0032	- 1'0965	0'0400192
λ <sub>20</sub> =							+ '7211	'0539	- '0074	1'1205	'2279	+ 2'8296	0'4517248
λ <sub>21</sub> =								'1503	'0921	'5637	'1137	- 0'1472	1'1680517
λ <sub>22</sub> =									+ '7153	- '3664	+ '0744	1'4492	0'1611255
λ <sub>23</sub> =										+ 12'3636	- 2'1442	+ 6'7841	0'8314899
λ <sub>24</sub> =											+ '4339	- 1'2207	0'0865962

Adopted angular errors in seconds

x <sub>1</sub> = + '51	x <sub>8</sub> = - '86	x <sub>15</sub> = - 1'35	x <sub>22</sub> = - 5'28	x <sub>29</sub> = - '64	x <sub>36</sub> = + '66
x <sub>2</sub> = - '08	x <sub>9</sub> = '75	x <sub>16</sub> = 1'33	x <sub>23</sub> = '61	x <sub>30</sub> = 2'04	x <sub>37</sub> = - '65
x <sub>3</sub> = + '33	x <sub>10</sub> = + '45	x <sub>17</sub> = + 1'47	x <sub>24</sub> = '01	x <sub>31</sub> = + 1'01	x <sub>38</sub> = + '42
x <sub>4</sub> = - '95	x <sub>11</sub> = '10	x <sub>18</sub> = '86	x <sub>25</sub> = + 1'14	x <sub>32</sub> = '67	x <sub>39</sub> = '68
x <sub>5</sub> = + '83	x <sub>12</sub> = '05	x <sub>19</sub> = - '90	x <sub>26</sub> = - '85	x <sub>33</sub> = - 2'55	x <sub>40</sub> = '44
x <sub>6</sub> = '26	x <sub>13</sub> = '19	x <sub>20</sub> = 2'91	x <sub>27</sub> = '37	x <sub>34</sub> = '50	x <sub>41</sub> = - 1'20
x <sub>7</sub> = '18	x <sub>14</sub> = '22	x <sub>21</sub> = 2'09	x <sub>28</sub> = + '51	x <sub>35</sub> = 3'36	x <sub>42</sub> = '70

[wx<sup>2</sup>] = 70'16

Figure No. 17.

Observed Angles										
No.	Value			Reciprocal Weight	Equations to be satisfied				Factor	
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = -0''.75,$	$\lambda_1$
1	40	19	51.90	.12	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = +1.58,$	$\lambda_2$
2	42	0	11.89	.08	$x_1$	$+x_2$	$+x_3$	$+x_4 +$	} $=e_3 = -1.93,$	$\lambda_3$
3	43	44	60.10	.12	$x_5$	$+x_6$	$+x_7$	$+x_8$		
4	53	54	58.76	.09	$1.18 x_1$	$-1.11 x_2$	$+1.04 x_3$	$-.73 x_4 +$	} $=e_4 = +0.29,$	$\lambda_4$
5	45	55	19.53	.05	$+ .97 x_5$	$-1.36 x_6$	$+ .88 x_7$	$-.87 x_8$		
6	36	24	44.76	.24						
7	48	46	54.12	.18						
8	48	53	3.52	.10						

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	$-0''75$	$+ .49$		$-.09$	$+ .330$	$\lambda_1 =$	$+2.5555$	$+ .0065$	$+ .1666$	$-.7187$	$-2.435$	$0.3864990$
2	$+1.58$		$+ .49$	$-.07$	$-.012$	$\lambda_2 =$		$+2.0633$	$+ .1512$	$+ .0316$	$+2.973$	$0.4731949$
3	$-1.93$	*		$+ .98$	$-.094$	$\lambda_3 =$	*		$+1.0508$	$+ .0399$	$-1.902$	$0.2792105$
4	$+0.29$				$+1.150$	$\lambda_4 =$				$+1.0787$	$+0.825$	$1.9164539$

Adopted angular errors in seconds

$x_1 = -.42$	$x_5 = +.05$
$x_2 = -.40$	$x_6 = -.12$
$x_3 = +.23$	$x_7 = -.75$
$x_4 = +.04$	$x_8 = -.56$

$[wx^2] = 10.43$

Figure No. 18.

Observed Angles				Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1=+1^{\prime\prime}.55,$	$\lambda_1$				
	°	'	"		$x_1$	$+x_6$	$+x_{12}$	$=e_2=-.42,$	$\lambda_2$				
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3=+.47,$	$\lambda_3$				
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4=-.15,$	$\lambda_4$				
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5=+.35,$	$\lambda_5$				
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6=+.18,$	$\lambda_6$				
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$				
					$+x_{10}$								
1	59	24	56.87	.05	$+ .17x_3$	$-.85x_2$	$+ .59x_1$	$-.11x_{12}$	$+ .59x_{11}$	$-.64x_{18}$	$=e_7=+.56,$	$\lambda_7$	
2	49	31	0.69	.14	$+ .63x_{15}$	$-.61x_{18}$	$+ .52x_{17}$	$-.80x_{14}$	$+ 1.14x_{13}$	$-.60x_4$	$=e_8=-1.95,$	$\lambda_8$	
3	80	10	30.42	.24									
4	58	55	30.17	.31									
5	50	18	33.84	.07									
6	36	47	56.05	.10									
7	63	23	55.75	.12									
8	63	35	14.17	.09									
9	66	8	39.55	.20									
10	79	45	41.20	.12									
11	59	17	27.95	.25									
12	83	47	9.63	.29									
13	41	18	53.16	.16									
14	51	14	58.22	.15									
15	57	56	35.25	.11									
16	57	18	40.69	.13									
17	62	36	27.19	.18									
18	58	28	14.41	.08									
Equations between the factors													
						Co-efficients of							
				No. of e	Value of e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
				1	$+1^{\prime\prime}.55$	$+ .45$						$+ .07$	$-.078$
				2	$-.42$		$+ .44$					$+ .10$	$-.002$
				3	$+ .47$			$+ .50$				$+ .12$	$+ .065$
				4	$-.15$				$+ .28$			$+ .09$	$+ .020$
				5	$+ .35$					$+ .53$		$+ .20$	$-.026$
				6	$+ .18$						$+ .59$	$+ .12$	$-.004$
				7	$+ .56$			*				$+ .70$	
				8	$-1.95$								$+ .807$
Values of the Factors													
Factor	SYMBOLICAL								Numerical	Logarithmic			
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$					
$\lambda_1=$	$+2.308$	$+ .071$	$+ .045$	$+ .083$	$+ .127$	$+ .064$	$-.307$	$+ .221$	$+3.009$	$0.4784222$			
$\lambda_2=$		$+2.374$	$+ .106$	$+ .143$	$+ .168$	$+ .091$	$-.446$	$+ .007$	$-1.045$	$0.0191163$			
$\lambda_3=$			$+2.134$	$+ .163$	$+ .169$	$+ .094$	$-.471$	$-.165$	$+1.138$	$0.0561423$			
$\lambda_4=$				$+3.780$	$+ .233$	$+ .127$	$-.631$	$-.090$	$-.493$	$1.6928469$			
$\lambda_5=$					$+2.169$	$+ .151$	$-.741$	$+ .064$	$+ .419$	$1.6222140$			
$\lambda_6=$						$+1.776$	$-.399$	$+ .010$	$+ .217$	$1.3364597$			
$\lambda_7=$				*			$+1.965$	$-.003$	$+ .356$	$1.5514500$			
$\lambda_8=$								$+1.276$	$-2.189$	$0.3402458$			
Adopted angular errors in seconds													
$x_1=$	$-.12$	$x_4=$	$+.47$	$x_7=$	$+.18$	$x_{10}=$	$+.07$	$x_{13}=$	$-.36$	$x_{16}=$	$+.33$		
$x_2=$	$+.68$	$x_5=$	$+.24$	$x_8=$	$-.01$	$x_{11}=$	$-.04$	$x_{14}=$	$+.33$	$x_{17}=$	$-.13$		
$x_3=$	$+.63$	$x_6=$	$-.07$	$x_9=$	$+.15$	$x_{12}=$	$-.23$	$x_{15}=$	$-.21$	$x_{18}=$	$+.07$		
$[wx^2] = 10.38$													

Figure No. 19.

Observed Angles					Equations to be satisfied								Factor									
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1=+$	$\lambda_1$													
					$x_1$	$+x_6$	$+x_{12}$	$=e_2=-$	$\lambda_2$													
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3=+$	$\lambda_3$													
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4=+$	$\lambda_4$													
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5=+$	$\lambda_5$													
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6=-$	$\lambda_6$													
					$x_5$	$+x_6$	$+x_8$	$+x_9$	$+x_{10}$	$=e_7=-$	$\lambda_7$											
1	72	4	5'73	07	$+ \cdot 73 x_3 - 1 \cdot 21 x_2 + \cdot 32 x_1 - \cdot 57 x_{12} + \cdot 42 x_{11} - \cdot 33 x_{16}$ $+ \cdot 78 x_{15} - \cdot 71 x_{18} + 1 \cdot 28 x_{17} - \cdot 03 x_{14} + \cdot 32 x_{13} - \cdot 84 x_4$								$=e_8=-$	$\lambda_8$								
2	39	31	59'19	16																		
3	54	1	4'06	09	Equations between the factors																	
4	49	48	53'45	10																		
5	86	26	59'61	03	Co-efficients of																	
6	47	39	9'48	09																		
7	41	13	54'98	05	No. of e	Value of e																
8	73	17	10'79	08			$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$								
9	53	33	54'02	08																		
10	57	48	50'77	07																		
11	67	12	17'84	32																		
12	60	16	45'88	11	1	$+ \cdot 31$	$+ \cdot 28$					$+ \cdot 03$	$- \cdot 128$									
13	72	22	16'89	08	2	$- 1 \cdot 54$		$+ \cdot 27$				$+ \cdot 09$	$- \cdot 041$									
14	88	32	2'92	08	3	$+ 1 \cdot 68$			$+ \cdot 44$			$+ \cdot 05$	$+ \cdot 111$									
15	51	56	20'39	04	4	$+ \cdot 13$			$+ \cdot 27$			$+ \cdot 08$	$- \cdot 076$									
16	71	33	51'36	07	5	$+ \cdot 57$				$+ \cdot 21$		$+ \cdot 08$	$+ \cdot 062$									
17	37	54	5'32	05	6	$- \cdot 25$		*			$+ \cdot 25$	$+ \cdot 07$	$- \cdot 058$									
18	54	46	32'35	15	7	$- \cdot 35$						$+ \cdot 40$										
					8	$- 1 \cdot 00$							$+ \cdot 650$									

Values of the Factors

Factor	Symbolical								Numerical	Logarithmic
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$		
$\lambda_1 =$	$+ 4 \cdot 047$	$+ \cdot 297$	$- \cdot 182$	$+ \cdot 400$	$- \cdot 097$	$+ \cdot 347$	$- \cdot 467$	$+ \cdot 932$	$- \cdot 364$	$\bar{1} \cdot 5611614$
$\lambda_2 =$		$+ 4 \cdot 159$	$+ \cdot 043$	$+ \cdot 459$	$+ \cdot 347$	$+ \cdot 421$	$- 1 \cdot 198$	$+ \cdot 370$	$- 6 \cdot 037$	$0 \cdot 7808212$
$\lambda_3 =$			$+ 2 \cdot 433$	$- \cdot 031$	$+ \cdot 274$	$- \cdot 013$	$- \cdot 349$	$- \cdot 479$	$+ 4 \cdot 720$	$0 \cdot 6739420$
$\lambda_4 =$				$+ 4 \cdot 202$	$+ \cdot 234$	$+ \cdot 450$	$- 1 \cdot 095$	$+ \cdot 620$	$- \cdot 304$	$\bar{1} \cdot 4828736$
$\lambda_5 =$					$+ 5 \cdot 399$	$+ \cdot 239$	$- 1 \cdot 277$	$- \cdot 511$	$+ 3 \cdot 900$	$0 \cdot 5910646$
$\lambda_6 =$			*			$+ 4 \cdot 409$	$- 1 \cdot 029$	$+ \cdot 519$	$- 1 \cdot 628$	$0 \cdot 2116544$
$\lambda_7 =$							$+ 3 \cdot 507$	$- \cdot 201$	$- \cdot 523$	$\bar{1} \cdot 7185017$
$\lambda_8 =$								$+ 1 \cdot 993$	$- 3 \cdot 344$	$0 \cdot 5242663$

Adopted angular errors in seconds

$x_1 = - \cdot 50$	$x_4 = + \cdot 11$	$x_7 = + \cdot 21$	$x_{10} = - \cdot 15$	$x_{13} = - \cdot 21$	$x_{16} = + \cdot 41$
$x_2 = + \cdot 58$	$x_5 = - \cdot 03$	$x_8 = - \cdot 06$	$x_{11} = + 1 \cdot 06$	$x_{14} = + \cdot 31$	$x_{17} = - \cdot 01$
$x_3 = - \cdot 24$	$x_6 = - \cdot 59$	$x_9 = + \cdot 27$	$x_{12} = - \cdot 45$	$x_{15} = - \cdot 11$	$x_{18} = + \cdot 30$

$[wx^2] = 23 \cdot 23$

Figure No. 20.

Observed Angles			Equations to be satisfied											Factor			
No.	Value	Reciprocal Weight	$x_2 + x_3 + x_5 \dots$	$x_1 + x_6 + x_{12} \dots$	$x_4 + x_9 + x_{13} \dots$	$x_7 + x_{11} + x_{17} \dots$	$x_{10} + x_{18} + x_{22} \dots$	$x_{19} + x_{21} + x_{24} \dots$	$x_8 + x_{14} + x_{16} \dots$	$x_{15} + x_{20} + x_{23} \dots$	$x_6 + x_8 + x_7 + x_8 + x_9 \dots$	$x_{16} + x_{17} + x_{18} + x_{19} + x_{20} \dots$	$.16x_1 - .141x_2 + .60x_{11} - .131x_{12} + .62x_{16} - .22x_{17} + 1.44x_{13} - .73x_{14} + 1.28x_3 - .47x_4 = e_{11} = + .38, \lambda_{11}$	$.106x_7 - .40x_8 + .71x_{10} - .60x_{11} + .61x_{21} - 1.02x_{22} + .65x_{23} - .65x_{24} + .73x_{14} - 1.03x_{15} = e_{12} = + .33, \lambda_{12}$			
1	80° 54' 27.91"	.08															
2	35 22 41.01	.08															
3	38 5 34.13	.07															
4	64 51 50.45	.06															
5	106 31 47.21	.17															
6	61 39 10.18	.11															
7	43 24 41.22	.08															
8	67 57 35.77	.13															
9	80 26 46.05	.26															
10	54 36 17.42	.04															
11	58 55 48.21	.10															
12	37 26 24.60	.05															
13	34 41 27.06	.11															
14	54 1 19.75	.05															
15	44 9 34.23	.14															
16	58 1 8.31	.10															
17	77 39 33.06	.05															
18	80 54 24.61	.11															
19	64 34 42.80	.16															
20	78 50 11.32	.05															
21	58 34 53.35	.08															
22	44 29 21.51	.15															
23	57 0 18.59	.10															
24	56 50 27.52	.12															

Equations between the factors													
No. of e	Value of e	Co-efficients of											
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$
1	+.47	+.32								+.17		-.0232	
2	-.30		+.24							.11		.0527	
3	+.67			+.43						.26		+.1302	
4	-.84				+.23					.08	+.05	.0490	+.0248
5	+.40					+.30					.11		-.1246
6	.26						+.36				.16		.0292
7	-.30							+.28			.13	.10	.0255
8	.40			*					+.29		.10	.05	.0792
9	+.43									.75			+.0328
10	.10										.47		.0510
11	.38											.7063	-.0626
12	.33												+.6209

Values of the Factors														
Factor	Symbolical											Numerical	Logarithmic	
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$	$e_{10}$	$e_{11}$			$e_{12}$
$\lambda_1 =$	+3.9406	+ .6996	+ .9386	+ .6030	+ .1847	+ .1678	+ .8504	+ .0969	-1.5387	- .3529	- .0267	+ .1330	+ 0.9247	1.9660009
$\lambda_2 =$		4.8063	.7067	.4539	.1817	.1583	.7011	.0969	1.2845	.3293	+ .2314	.1469	-1.6047	0.2054047
$\lambda_3 =$			3.6458	.8509	.1553	.1572	1.0468	.0786	1.8556	.3406	- .6543	.0728	+ 0.6577	1.8179948
$\lambda_4 =$				5.0583	.3080	.3992	.9146	.1403	1.1935	.9094	.4268	- .0606	-4.4210	0.6455166
$\lambda_5 =$					4.3147	.7633	.7425	.5400	.3279	1.5334	+ .1429	+ 1.0086	+ 1.4555	0.1630122
$\lambda_6 =$						3.5356	.7375	.3897	.3034	1.6323	.0869	.3965	0.5186	1.7148576
$\lambda_7 =$							4.9354	.3790	1.6283	1.5899	- .2055	.3841	-1.8314	0.2627856
$\lambda_8 =$								3.7507	.1718	.7626	+ .0831	.6265	1.2571	0.0993629
$\lambda_9 =$			*							+ 2.9331	+ .6425	.2712	- .2226	+ 1.1237
$\lambda_{10} =$											3.5758	- .1585	.5351	0.6101
$\lambda_{11} =$												+ 1.6193	+ .2042	0.7300
$\lambda_{12} =$														1.9559
														0.8327
														1.9204938

Adopted angular errors in seconds					
$x_1 = - .13$	$x_5 = + .35$	$x_9 = + .46$	$x_{13} = + .19$	$x_{17} = - .20$	$x_{21} = + .06$
$x_2 = - .00$	$x_6 = - .05$	$x_{10} = + .06$	$x_{14} = - .08$	$x_{18} = + .23$	$x_{22} = + .11$
$x_3 = + .12$	$x_7 = - .19$	$x_{11} = - .45$	$x_{15} = - .28$	$x_{19} = + .18$	$x_{23} = - .09$
$x_4 = + .02$	$x_8 = - .14$	$x_{12} = - .12$	$x_{16} = - .08$	$x_{20} = - .03$	$x_{24} = + .02$

$[wx^2] = 7.92$





Figure No. 22.

Observed Angles				Equations to be satisfied								Factor		
No.	Value	Reciprocal Weight		$x_2$	$+ x_3$	$+ x_5$	$= e_1 = + .85,$	$\lambda_1$						
				$x_1$	$+ x_6$	$+ x_{12}$	$= e_2 = -1.95,$	$\lambda_2$						
				$x_7$	$+ x_{11}$	$+ x_{16}$	$= e_3 = - .36,$	$\lambda_3$						
				$x_8$	$+ x_{15}$	$+ x_{18}$	$= e_4 = + .90,$	$\lambda_4$						
				$x_9$	$+ x_{14}$	$+ x_{17}$	$= e_5 = - .41,$	$\lambda_5$						
				$x_4$	$+ x_{10}$	$+ x_{13}$	$= e_6 = - .84,$	$\lambda_6$						
				$x_5$	$+ x_8$	$+ x_7$	$+ x_3$	$+ x_9$	$+ x_{10}$					
				$\left. \begin{aligned} &+ .69x_3 - .46x_2 + .52x_1 - .47x_{12} + .47x_{11} - 1.07x_{16} \\ &+ .76x_{15} - .44x_{18} + .64x_{17} - .35x_{14} + .52x_{13} - .72x_4 \end{aligned} \right\} = e_8 = + 1.62, \lambda_8$										
Equations between the factors														
		No. of e	Value of e	Co-efficients of										
				$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$			
		1	+ .85	+ .52						+ .10	- .020			
		2	- 1.95		+ .70					+ .19	+ .126			
		3	- .36			+ .60				+ .23	- .072			
		4	+ .90				+ 1.01			+ .28	+ .423			
		5	- .41					+ .43		+ .16	+ .044			
		6	- .84			*			+ .61	+ .13	+ .175			
		7	- .13							+ 1.09				
		8	+ 1.62								+ 1.087			
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+ 1.971	+ .070	+ .096	+ .073	+ .095	+ .056	- .253	- .007	+ 1.508	0.1784013				
$\lambda_2 =$		+ 1.599	+ .125	+ .246	+ .189	+ .178	- .423	- .308	- 3.551	0.5503507				
$\lambda_3 =$			+ 1.860	+ .118	+ .178	+ .092	- .491	+ .043	- .743	1.8709888				
$\lambda_4 =$				+ 1.386	+ .249	+ .283	- .500	- .615	- .482	1.6830470				
$\lambda_5 =$					+ 2.551	+ .183	- .540	- .237	- 1.640	0.2148438				
$\lambda_6 =$			*			+ 1.842	- .375	- .428	- 2.344	0.3699576				
$\lambda_7 =$							+ 1.372	+ .287	+ 1.159	0.0640834				
$\lambda_8 =$								+ 1.277	+ 2.510	0.3996737				
Adopted angular errors in seconds														
$x_1 = - .83$	$x_4 = - .25$	$x_7 = + .10$	$x_{10} = - .15$	$x_{13} = - .44$	$x_{16} = - .54$									
$x_2 = + .09$	$x_5 = + .27$	$x_8 = + .19$	$x_{11} = + .08$	$x_{14} = - .33$	$x_{17} = .00$									
$x_3 = + .49$	$x_6 = - .46$	$x_9 = - .08$	$x_{12} = - .66$	$x_{15} = + .88$	$x_{18} = - .17$									
$[wx^2] = 14.60$														

Figure No. 23.

Observed Angles				Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_3$	$+x_3$	$+x_5$	$=e_1 = +2^{\circ}06,$	$\lambda_1$				
					$x_1$	$+x_8$	$+x_{12}$	$=e_2 = -^{\circ}68,$	$\lambda_2$				
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = +^{\circ}13,$	$\lambda_3$				
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = +^{\circ}66,$	$\lambda_4$				
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = -1^{\circ}20,$	$\lambda_5$				
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = -^{\circ}47,$	$\lambda_6$				
					$x_5$	$+x_8$	$+x_3$	$+x_9$	$+x_{10}$				
					$+^{\circ}57x_3$	$-1^{\circ}08x_2$	$+^{\circ}66x_1$	$-^{\circ}26x_{12}$	$+^{\circ}53x_{11}$	$-^{\circ}56x_{16}$			
					$+^{\circ}62x_{15}$	$-^{\circ}79x_{18}$	$+^{\circ}57x_{17}$	$-^{\circ}32x_{14}$	$+^{\circ}70x_{13}$	$-^{\circ}48x_4$			
								$=e_7 = -^{\circ}50,$	$\lambda_7$				
								$=e_8 = -^{\circ}86,$	$\lambda_8$				
1	56	22	50.51	.08									
2	42	55	34.49	.10									
3	60	25	36.31	.19									
4	64	23	25.86	.31									
5	76	38	51.97	.10									
6	48	13	2.12	.14									
7	56	55	30.31	.18									
8	69	58	24.22	.15									
9	47	30	6.15	.16									
10	60	44	4.73	.18									
11	62	9	12.19	.14									
12	75	24	7.29	.17									
13	54	52	29.49	.12									
14	72	10	23.44	.08									
15	58	24	22.93	.14									
16	60	55	18.22	.05									
17	60	19	29.77	.10									
18	51	37	14.23	.12									
Equations between the factors													
		No. of e		Value of e		Co-efficients of							
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
				1	$+2^{\circ}06$	$+^{\circ}39$						$+^{\circ}10$	$-^{\circ}000$
				2	$-^{\circ}68$		$+^{\circ}39$					$+^{\circ}14$	$+^{\circ}009$
				3	$+^{\circ}13$			$+^{\circ}37$				$+^{\circ}18$	$+^{\circ}046$
				4	$+^{\circ}66$				$+^{\circ}41$			$+^{\circ}15$	$-^{\circ}008$
				5	$-1^{\circ}20$					$+^{\circ}34$		$+^{\circ}16$	$+^{\circ}031$
				6	$-^{\circ}47$		*				$+^{\circ}61$	$+^{\circ}18$	$-^{\circ}065$
				7	$-^{\circ}50$							$+^{\circ}91$	
				8	$-^{\circ}86$								$+^{\circ}580$
Values of the Factors													
Factor	Symbolical								Numerical	Logarithmic			
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$					
$\lambda_1 =$	$+2^{\circ}680$	$+^{\circ}163$	$+^{\circ}222$	$+^{\circ}166$	$+^{\circ}215$	$+^{\circ}132$	$-^{\circ}454$	$-^{\circ}015$	$+5.469$	$0.7379079$			
$\lambda_2 =$		$+2^{\circ}795$	$+^{\circ}318$	$+^{\circ}232$	$+^{\circ}306$	$+^{\circ}182$	$-^{\circ}638$	$-^{\circ}061$	$-1.449$	$0.1610684$			
$\lambda_3 =$			$+3^{\circ}156$	$+^{\circ}313$	$+^{\circ}432$	$+^{\circ}230$	$-^{\circ}869$	$-^{\circ}248$	$+^{\circ}881$	$1.9449759$			
$\lambda_4 =$				$+2^{\circ}676$	$+^{\circ}304$	$+^{\circ}193$	$-^{\circ}648$	$+^{\circ}015$	$+1.849$	$0.2669369$			
$\lambda_5 =$					$+3^{\circ}354$	$+^{\circ}228$	$-^{\circ}841$	$-^{\circ}188$	$-3.059$	$0.4855795$			
$\lambda_6 =$						$+1^{\circ}810$	$-^{\circ}517$	$+^{\circ}173$	$-^{\circ}707$	$1.8494194$			
$\lambda_7 =$		*					$+1^{\circ}774$	$+^{\circ}057$	$-^{\circ}726$	$1.8609366$			
$\lambda_8 =$								$+1^{\circ}774$	$-1.420$	$0.1522883$			
Adopted angular errors in seconds													
$x_1 = -^{\circ}19$	$x_4 = -^{\circ}01$	$x_7 = +^{\circ}03$	$x_{10} = -^{\circ}26$	$x_{13} = -^{\circ}20$	$x_{16} = +^{\circ}08$								
$x_2 = +^{\circ}69$	$x_5 = +^{\circ}47$	$x_8 = +^{\circ}17$	$x_{11} = +^{\circ}02$	$x_{14} = -^{\circ}21$	$x_{17} = -^{\circ}39$								
$x_3 = +^{\circ}90$	$x_6 = -^{\circ}31$	$x_9 = -^{\circ}60$	$x_{12} = -^{\circ}18$	$x_{15} = +^{\circ}13$	$x_{18} = +^{\circ}36$								
$[wx^2] = 19.18$													

Figure No. 24.

Observed Angles					Equations to be satisfied								Factor									
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1=-.56,$	$\lambda_1$													
					$x_1$	$+x_6$	$+x_{12}$	$=e_2=+.60,$	$\lambda_2$													
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3=-1.05,$	$\lambda_3$													
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4=-.69,$	$\lambda_4$													
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5=+.85,$	$\lambda_5$													
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6=-.31,$	$\lambda_6$													
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$=e_7=-.10,$	$\lambda_7$										
					$+ .56x_2 - .58x_3 + 1.30x_1 - .32x_{12} + .52x_{11} - .81x_{16}$								$=e_8=-.95,$	$\lambda_8$								
					$+ .46x_{15} - .86x_{18} + .20x_{17} - .66x_{14} + .55x_{13} - .47x_4$																	
1	37	31	10.19	.16																		
2	59	46	44.28	.15																		
3	60	40	55.95	.09																		
4	64	59	59.74	.10																		
5	59	32	20.10	.18																		
6	70	6	20.48	.11																		
7	66	26	46.94	.13																		
8	65	9	3.48	.07																		
9	45	5	21.78	.13																		
10	53	40	7.12	.12																		
11	62	24	41.53	.18																		
12	72	22	30.56	.12																		
13	61	19	53.68	.15																		
14	56	25	5.12	.20																		
15	65	23	52.28	.08																		
16	51	8	30.92	.14																		
17	78	29	34.61	.14																		
18	49	27	4.15	.14																		
Equations between the factors																						
		No. of e		Value of e		Co-efficients of																
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$									
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
Values of the Factors																						
Factor	Symbolical								Numerical	Logarithmic												
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$														
$\lambda_1 =$	+2.762	+ .177	+ .254	+ .249	+ .270	+ .264	- .858	+ .148	-1.786	0.2518815												
$\lambda_2 =$		+3.006	+ .131	- .056	+ .006	+ .242	- .549	- .659	+2.215	0.3453737												
$\lambda_3 =$			+2.392	+ .160	+ .176	+ .180	- .578	+ .073	-2.602	0.4153073												
$\lambda_4 =$				+3.693	+ .234	+ .115	- .489	+ .445	-3.100	0.4913617												
$\lambda_5 =$					+2.359	+ .148	- .559	+ .346	+1.194	0.0770043												
$\lambda_6 =$		*				+2.925	- .643	- .139	- .857	1.9329808												
$\lambda_7 =$							+1.994	- .030	+ .649	1.8122447												
$\lambda_8 =$								+1.530	-1.973	0.2951271												
Adopted angular errors in seconds																						
$x_1 = -.05$	$x_4 = +.01$	$x_7 = -.26$	$x_{10} = -.03$	$x_{13} = -.29$	$x_{16} = -.14$																	
$x_2 = -.10$	$x_5 = -.20$	$x_8 = -.17$	$x_{11} = -.65$	$x_{14} = +.50$	$x_{17} = +.11$																	
$x_3 = -.26$	$x_6 = +.32$	$x_9 = +.24$	$x_{12} = +.33$	$x_{15} = -.31$	$x_{18} = -.21$																	
$[wx^2] = 10.28$																						

Figure No. 25.

Observed Angles				Equations to be satisfied						Factor	
No.	Value			Reciprocal Weight	$x_1$	$+x_2$	$-x_5$	$-x_6$	$= e_1 = + 1'29,$	$\lambda_1$	
1	44	55	18'87	04	$x_2$	$+x_4$	$-x_7$	$-x_8$	$= e_2 = + 0'12,$	$\lambda_2$	
2	60	21	13'10	30	$x_1$	$+x_2$	$+x_3$	$+x_4 +$	} $= e_3 = + 0'27,$	$\lambda_3$	
3	23	49	29'12	13	$x_5$	$+x_6$	$+x_7$	$+x_8$			
4	50	54	0'46	12	$1'00x_1$	$- .57x_2$	$+ 2'26x_3$	$- .81x_4 +$	} $= e_4 = - 3'52,$	$\lambda_4$	
5	81	30	16'70	06	$.15x_5$	$- 2'27x_6$	$+ 1'35x_7$	$- 1'27x_8$			
6	23	46	13'75	14							
7	36	33	9'91	16							
8	38	10	20'88	07							

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	+ 1'29	+ .54		+ .14	+ .178	$\lambda_1 =$	+ 1'9931	+ .0411	- .2963	- .1955	+ 3'185	0'5031094
2	+ 0'12		+ .48	+ .02	+ .070	$\lambda_2 =$		+ 2'0973	- .0562	- .0802	+ 0'571	1'7566361
3	+ 0'27	*		+ 1'02	- .116	$\lambda_3 =$		*	+ 1'0320	+ .0880	- 0'420	1'6232493
4	- 3'52				+ 2'007	$\lambda_4 =$				+ .5236	- 2'082	0'3184807

Adopted angular errors in seconds

$x_1 = + .03$	$x_5 = - .23$
$x_2 = + 1'18$	$x_6 = + .15$
$x_3 = - .59$	$x_7 = - .61$
$x_4 = + .22$	$x_8 = + .12$

$[wx^2] = 11'40$

Figure No. 26.

Observed Angles				Equations to be satisfied				Factor				
No.	Value			Reciprocal Weight								
	°	'	"		$x_1$	$+ x_2$	$- x_5$	$- x_6$	$= e_1 = + 0''\cdot92,$	$\lambda_1$		
					$x_3$	$+ x_4$	$- x_7$	$- x_8$	$= e_2 = + 0\cdot80,$	$\lambda_2$		
1	58	19	16'64	·13	$x_1$	$+ x_2$	$+ x_3$	$+ x_4 +$	} $= e_3 = - 0\cdot54,$	$\lambda_3$		
2	43	45	44'99	·11	$x_5$	$+ x_6$	$+ x_7$	$+ x_8$				
3	42	15	52'10	·09	$\cdot62 x_1$	$- 1\cdot04 x_2$	$+ 1\cdot10 x_3$	$- 1\cdot39 x_4 +$	} $= e_4 = - 0\cdot24,$	$\lambda_4$		
4	35	39	7'81	·18	$1\cdot90 x_5$	$- \cdot28 x_6$	$+ \cdot92 x_7$	$- 1\cdot70 x_8$				
5	27	48	13'01	·15								
6	74	16	47'62	·04								
7	47	27	37'00	·06								
8	30	27	21'77	·08								

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	+''92	+·43		+·05	-·307	$\lambda_1 =$	+2'7733	+·1642	-·1966	+·5951	+2'647	0'4227539
2	+·80		+·41	+·13	-·070	$\lambda_2 =$		+2'5980	-·4135	+·1625	+2'412	0'3823773
3	-·54		*	+·84	+·009	$\lambda_3 =$		*	+1'2668	-·0691	-1'180	0'0718820
4	-·24				+1'453	$\lambda_4 =$				+·8224	+0'518	1'7143298

Adopted angular errors in seconds

$x_1 = + \cdot24$	$x_5 = - \cdot42$
$x_2 = + \cdot09$	$x_6 = - \cdot17$
$x_3 = + \cdot17$	$x_7 = - \cdot18$
$x_4 = + \cdot09$	$x_8 = - \cdot36$

$[wx^2] = 4\cdot89$

Figure No. 27.

Observed Angles					Equations to be satisfied					Factor
No.	Value			Reciprocal Weight						
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = +0''45,$	$\lambda_1$
1	42	46	20'35	08	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = +0''11,$	$\lambda_2$
2	65	28	2'23	10	$x_1$	$+x_2$	$+x_3$	$+x_4 +$	} $=e_3 = + '10,$	$\lambda_3$
3	40	31	35'02	07	$x_5$	$+x_6$	$+x_7$	$+x_8$		
4	31	14	3'58	13	$1\cdot08 x_1$	$-46 x_2$	$+1\cdot17 x_3$	$-1\cdot65 x_4 +$	} $=e_4 = -4'13,$	$\lambda_4$
5	59	2	45'24	14	$\cdot60 x_5$	$-86 x_6$	$+1\cdot45 x_7$	$-1\cdot32 x_8$		
6	49	11	37'04	09						
7	34	40	34'83	11						
8	37	5	3'88	11						

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	+ 0''45	+41		-05 + 033	$\lambda_1 =$	+2'4617	-0166	+1'423	-0662	+1'395	0'1445742	
2	+ 0''11		+42	-02 - 148	$\lambda_2 =$		+2'5057	+0891	+3419	-1'136	0'0553783	
3	+ 0''10		*	+83 - 071	$\lambda_3 =$		*	+1'2228	+0864	-0'160	1'2041200	
4	-4'13			+1'104	$\lambda_4 =$		.		+9597	-3'947	0'5962671	

Adopted angular errors in seconds

$x_1 = -\cdot28$	$x_5 = -\cdot56$
$x_2 = +\cdot34$	$x_6 = +\cdot18$
$x_3 = -\cdot41$	$x_7 = -\cdot52$
$x_4 = +\cdot67$	$x_8 = +\cdot68$

$[wx^2] = 16\cdot79$

Figure No. 28.

Observed Angles					Equations to be satisfied					Factor
No.	Value			Reciprocal Weight						
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_8$	$=e_1 = -''29,$	$\lambda_1$
1	46	10	40.44	.05	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = +.89,$	$\lambda_2$
2	51	16	5.81	.07	$x_1$	$+x_2$	$+x_3$	$+x_4 +$	} $=e_3 = -.38,$	$\lambda_3$
3	47	27	50.46	.06	$x_5$	$+x_6$	$+x_7$	$+x_8$		
4	35	5	24.46	.12	$.96 x_1$	$-.80 x_2$	$+.92 x_3$	$-1.42 x_4 +$	} $=e_4 = +.57,$	$\lambda_4$
5	26	33	49.34	.09	$2.00 x_5$	$-.35 x_6$	$+.70 x_7$	$-1.93 x_8$		
6	70	52	57.07	.21						
7	55	8	24.99	.11						
8	27	24	48.76	.13						

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-''29	+ .42		- .18	- .114	$\lambda_1 =$	+ 2.7607	+ 0.0490	+ .6725	+ .3365	- .819	$\bar{1}.9132839$
2	+ .89		+ .42	- .06	+ .059	$\lambda_2 =$		+ 2.4157	+ .1650	- .0801	+ 2.029	$0.3072820$
3	- .38	*		+ .84	- .191	$\lambda_3 =$	*		+ 1.4053	+ .2571	- .436	$\bar{1}.6394865$
4	+ .57				+ 1.308	$\lambda_4 =$				+ .8347	+ .209	$\bar{1}.3201463$

Adopted angular errors in seconds

$x_1 = -.05$	$x_5 = +.08$
$x_2 = -.10$	$x_6 = +.06$
$x_3 = +.10$	$x_7 = -.25$
$x_4 = +.16$	$x_8 = -.38$

$[wx^2] = 2.34$



Figure No. 29.

Observed Angles				Equations to be satisfied								Factor		
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1 = -.43,$	$\lambda_1$					
	°	'	"		$x_1$	$+x_6$	$+x_{12}$	$=e_2 = -.65,$	$\lambda_2$					
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = -.01,$	$\lambda_3$					
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = -.74,$	$\lambda_4$					
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = +.46,$	$\lambda_5$					
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = +.77,$	$\lambda_6$					
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$				
1	72	34	7.46	.08	$+1.00x_3 - .29x_2 + .31x_1 - .71x_{12} + .23x_{11} - 1.46x_{16}$ $+ .80x_{15} - .20x_{18} + .59x_{17} - .15x_{14} + 1.00x_{13} - .94x_4$								$=e_7 = -.07,$	$\lambda_7$
2	73	45	41.80	.12									$=e_8 = -.95,$	$\lambda_8$
3	45	4	39.66	.15	Equations between the factors									
4	46	47	48.77	.16										
5	61	9	38.75	.11										
6	52	46	10.08	.08										
7	68	37	44.21	.13										
8	49	57	41.88	.25										
9	39	13	53.70	.27										
10	88	14	51.31	.18										
11	76	58	9.77	.08										
12	54	39	42.31	.05										
13	44	57	21.71	.06										
14	81	16	53.24	.04										
15	51	18	19.18	.04										
16	34	24	7.19	.08										
17	59	29	14.28	.12										
18	78	43	59.53	.08										
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+2.972	+ .199	+ .078	+ .427	+ .459	+ .144	- .597	- .555	- .832	$\bar{1}.9201233$				
$\lambda_2 =$		+5.070	+ .390	+ .532	+ .483	+ .380	- .794	+ .102	- 3.305	$\bar{0}.5191715$				
$\lambda_3 =$			+4.085	+ .606	+ .492	+ .565	- .937	+ .636	- .652	$\bar{1}.8142476$				
$\lambda_4 =$				+3.656	+ .893	+ .617	- 1.406	- .069	- 2.189	$\bar{0}.3402458$				
$\lambda_5 =$					+3.186	+ .527	- 1.305	- .269	+ 1.042	$\bar{0}.0178677$				
$\lambda_6 =$						+3.018	- .940	+ .422	+ 1.460	$\bar{0}.1643529$				
$\lambda_7 =$			*				+2.081	- .015	+ .365	$\bar{1}.5622929$				
$\lambda_8 =$								+1.846	- 1.335	$\bar{0}.1254813$				
Adopted angular errors in seconds														
$x_1 =$	- .30	$x_4 =$	+ .43	$x_7 =$	- .04	$x_{10} =$	+ .33	$x_{13} =$	+ .01	$x_{16} =$	+ .10			
$x_2 =$	- .05	$x_5 =$	- .05	$x_8 =$	- .46	$x_{11} =$	- .07	$x_{14} =$	+ .05	$x_{17} =$	+ .03			
$x_3 =$	- .33	$x_6 =$	- .23	$x_9 =$	+ .38	$x_{12} =$	- .12	$x_{15} =$	- .13	$x_{18} =$	- .15			
$[wx^2] = 6.98$														

Figure No. 30.

Observed Angles				Equations to be satisfied							Factor				
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1 = +2.09,$	$\lambda_1$						
					$x_1$	$+x_6$	$+x_{13}$	$=e_2 = -2.07,$	$\lambda_2$						
					$x_7$	$+x_{12}$	$+x_{19}$	$=e_3 = +2.05,$	$\lambda_3$						
					$x_8$	$+x_{18}$	$+x_{21}$	$=e_4 = -1.95,$	$\lambda_4$						
					$x_9$	$+x_{17}$	$+x_{20}$	$=e_5 = +.29,$	$\lambda_5$						
					$x_{10}$	$+x_{15}$	$+x_{16}$	$=e_6 = +.17,$	$\lambda_6$						
					$x_4$	$+x_{11}$	$+x_{14}$	$=e_7 = -1.73,$	$\lambda_7$						
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$+x_{11}$	$=e_8 = +.10,$	$\lambda_8$		
1	47	1	1.49	.04	$+ .48x_3 - .38x_5 + .93x_1 - .48x_{13} + .32x_{19} - .60x_{19} + .51x_{18}$ $- .30x_{21} + .50x_{20} - .32x_{17} + .57x_{16} - .72x_{15} + .12x_{14} - .73x_4$							$=e_9 = +.19,$	$\lambda_9$		
2	68	58	54.14	.06											
3	64	27	9.19	.12											
4	53	59	29.07	.11	Equations between the factors										
5	46	34	0.31	.15											
6	68	44	7.88	.19	Co-efficients of										
7	48	33	0.12	.42											
8	43	33	44.65	.18	No. of e	Value of e									
9	44	25	36.66	.07			$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$
10	65	32	40.86	.24											
11	42	36	49.62	.22	1	+2.09	+33						+15	+0.35	
12	72	16	28.35	.11	2	-2.07		+36					+19	-0.25	
13	64	14	50.12	.13	3	+2.05			+65				+42	-0.37	
14	83	23	40.80	.10	4	-1.95				+64			+18	-0.49	
15	54	21	8.10	.06	5	+2.29					+30		+07	+0.33	
16	60	6	12.46	.07	6	+1.17		*				+37	+24	-0.03	
17	72	1	13.66	.10	7	-1.73							+43	+22	-0.68
18	63	7	38.13	.11	8	+1.10								+1.47	
19	59	10	34.71	.12	9	+1.19								+372	
20	63	33	10.92	.13	Values of the Factors										
21	73	18	36.34	.35											
Factor	Symbolical									Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$						
$\lambda_1 =$	+3.340	+3.223	+4.00	+1.64	+1.69	+4.11	+2.96	-6.36	-1.89	+6.318	0.8005796				
$\lambda_2 =$		+3.219	+5.31	+2.49	+1.46	+5.16	+4.60	-7.91	+3.46	-6.067	0.7829740				
$\lambda_3 =$			+2.178	+2.96	+1.86	+6.26	+5.46	-9.60	+3.43	+2.811	0.4488608				
$\lambda_4 =$				+1.707	+0.67	+2.83	+2.69	-4.32	+3.03	-3.277	0.5154764				
$\lambda_5 =$					+3.435	+2.00	+1.18	-3.11	-2.61	+1.043	0.0182843				
$\lambda_6 =$						+3.321	+5.18	-9.51	+1.99	+1.189	1.2764618				
$\lambda_7 =$			*				+2.826	-7.91	+6.04	-4.472	0.6505018				
$\lambda_8 =$								+1.462	-2.71	+3.394	1.5954962				
$\lambda_9 =$									+2.945	-1.557	0.1922886				
Adopted angular errors in seconds															
$x_1 = -30$	$x_4 = -37$	$x_7 = +1.35$	$x_{10} = +1.4$	$x_{13} = -69$	$x_{16} = -05$	$x_{19} = +45$									
$x_2 = +41$	$x_5 = +1.01$	$x_8 = -52$	$x_{11} = -90$	$x_{14} = -46$	$x_{17} = +15$	$x_{20} = +04$									
$x_3 = +67$	$x_6 = -1.08$	$x_9 = +10$	$x_{12} = +25$	$x_{15} = +08$	$x_{18} = -45$	$x_{21} = -98$									
$[wx^2] = 45.73$															

Figure No. 31.

Observed Angles				Equations to be satisfied								Factor										
No.	Value			Reciprocal Weight	$x_2$	$+x_8$	$+x_5$	$=e_1 = +$	"	$\lambda_1$												
	°	'	"		$x_1$	$+x_6$	$+x_{12}$	$=e_2 = +$	$1.40$	$\lambda_2$												
1	60	31	22.19	.06	$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = +$	.02	$\lambda_3$												
2	57	5	19.05	.14	$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = +$	.82	$\lambda_4$												
3	60	42	31.91	.33	$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = -$	.12	$\lambda_5$												
4	58	3	12.87	.18	$x_4$	$+x_{10}$	$+x_{18}$	$=e_6 = +$	.53	$\lambda_6$												
5	62	12	10.33	.15	$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$												
6	55	15	52.69	.11	$\left. \begin{aligned} &+.56x_3 - .65x_2 + .57x_1 - .48x_{12} + .57x_{11} - .46x_{16} \\ &+.68x_{15} - .67x_{18} + .70x_{17} - .60x_{14} + .40x_{13} - .62x_4 \end{aligned} \right\} = e_7 = + .30, \lambda_7$																	
7	54	45	47.93	.15	Equations between the factors																	
8	68	14	1.50	.11	Equations between the factors																	
9	65	50	46.38	.09	Equations between the factors																	
10	53	41	21.47	.07	Equations between the factors																	
11	60	7	20.59	.07	Equations between the factors																	
12	64	12	47.19	.17	Equations between the factors																	
13	68	15	26.76	.14	Equations between the factors																	
14	59	3	45.64	.22	Equations between the factors																	
15	55	40	54.32	.16	Equations between the factors																	
16	65	6	52.11	.10	Equations between the factors																	
17	55	5	28.48	.16	Equations between the factors																	
18	56	5	5.66	.11	Equations between the factors																	
Equations between the factors																						
					Co-efficients of																	
					No. of e	Value of e																
													$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$		
					1	+ .57								+ .62								
					2	+ 1.40									+ .34					+ .15	+ .094	
					3	+ .02										+ .32				+ .11	- .048	
					4	+ .82											+ .38			+ .15	- .006	
					5	- .12												+ .47		+ .09	- .020	
					6	+ .53										*			+ .39	+ .07	- .056	
					7	+ .30														+ .07	- .056	
					8	- .05														+ .68		+ .637
Values of the Factors																						
Factor	Symbolical								Numerical	Logarithmic												
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$														
$\lambda_1 =$	+1.774	+ .129	+ .233	+ .170	+ .086	+ .055	- .508	- .252	+ 1.215	0.0845763												
$\lambda_2 =$		+ 3.194	+ .323	+ .175	+ .140	+ .155	- .679	+ .232	+ 4.544	0.6574383												
$\lambda_3 =$			+ 3.587	+ .281	+ .189	+ .180	- .983	+ .030	+ .666	1.8234742												
$\lambda_4 =$				+ 2.821	+ .109	+ .086	- .606	- .153	+ 2.521	0.4015728												
$\lambda_5 =$					+ 2.207	+ .082	- .400	+ .071	- .006	3.7781513												
$\lambda_6 =$			*			+ 2.665	- .375	+ .237	+ 1.603	0.2049335												
$\lambda_7 =$							+ 2.097	+ .003	- 1.281	0.1075491												
$\lambda_8 =$								+ 1.653	+ .091	2.9590414												
Adopted angular errors in seconds																						
$x_1 = +.28$	$x_4 = +.28$	$x_7 = -.09$	$x_{10} = +.02$	$x_{13} = +.23$	$x_{16} = +.06$																	
$x_2 = +.16$	$x_5 = -.01$	$x_8 = +.14$	$x_{11} = +.05$	$x_{14} = -.01$	$x_{17} = +.01$																	
$x_3 = +.42$	$x_6 = +.36$	$x_9 = -.12$	$x_{12} = +.76$	$x_{15} = +.41$	$x_{18} = +.27$																	
$[wx^2] = 9.61$																						

Figure No. 32.

Observed Angles					Equations to be satisfied								Factor					
No.	Value	Reciprocal Weight			$x_2$	$+x_3$	$+x_5$	$=e_1=+$	$\lambda_1$									
					$x_1$	$+x_6$	$+x_{13}$	$=e_2=+$	$\lambda_2$									
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3=-$	$\lambda_3$									
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4=+$	$\lambda_4$									
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5=+$	$\lambda_5$									
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6=+$	$\lambda_6$									
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$								
					$+0.61x_3$	$-0.54x_2$	$+0.80x_1$	$-0.42x_{12}$	$+0.39x_{11}$	$-0.84x_{16}$								
					$+0.47x_{15}$	$-0.53x_{18}$	$+0.68x_{17}$	$-0.47x_{14}$	$+0.56x_{13}$	$-0.72x_4$								
Equations between the factors																		
					No. of e	Value of e	Co-efficients of											
							$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$				
1	51	15	58.69	.38														
2	61	47	45.27	.28														
3	58	31	30.64	.47														
4	54	10	14.22	.27														
5	59	40	45.53	.07														
6	61	35	22.83	.28														
7	61	8	36.52	.18														
8	53	12	11.96	.10														
9	59	15	44.04	.19														
10	65	7	19.03	.25														
11	68	52	3.76	.18														
12	67	8	41.06	.27														
13	60	42	28.20	.18	1	+ .66	+ .82					+ .07	+ .136					
14	65	0	35.39	.16	2	+1.93		+ .93				+ .28	+ .191					
15	64	38	34.91	.18	3	- .72			+ .50			+ .18	- .048					
16	49	59	19.67	.14	4	+1.07				+ .62		+ .10	- .095					
17	55	43	41.54	.11	5	+ .21					+ .46	+ .19	- .000					
18	62	9	14.96	.34	6	+ .66			*			+ .70	+ .25	- .093				
					7	- .09							+1.07					
					8	+1.19								+1.091				
Values of the Factors																		
Factor	Symbolical								Numerical	Logarithmic								
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$										
$\lambda_1 =$	+1.257	+ .069	+ .026	- .007	+ .048	+ .020	- .117	- .167	+ .773	$\bar{1}.8881795$								
$\lambda_2 =$		+1.242	+ .128	+ .035	+ .170	+ .120	- .412	- .207	+2.292	$\bar{0}.3602146$								
$\lambda_3 =$			+2.186	+ .093	+ .203	+ .188	- .491	+ .094	- .886	$\bar{1}.9474337$								
$\lambda_4 =$				+1.672	+ .090	+ .099	- .219	+ .153	+2.069	$\bar{0}.3157605$								
$\lambda_5 =$					+2.407	+ .201	- .564	- .002	+ .998	$\bar{1}.9991305$								
$\lambda_6 =$			*			+1.620	- .487	+ .132	+1.526	$\bar{0}.1835545$								
$\lambda_7 =$							+1.366	+ .005	-1.311	$\bar{0}.1176027$								
$\lambda_8 =$								+1.003	+ .864	$\bar{1}.9365137$								
Adopted angular errors in seconds																		
$x_1 =$	+1.14	$x_4 =$	+ .25	$x_7 =$	- .39	$x_{10} =$	+ .05	$x_{13} =$	+ .36	$x_{16} =$	- .24							
$x_2 =$	+ .09	$x_5 =$	- .04	$x_8 =$	+ .07	$x_{11} =$	- .09	$x_{14} =$	+ .10	$x_{17} =$	+ .17							
$x_3 =$	+ .61	$x_6 =$	+ .28	$x_9 =$	- .06	$x_{12} =$	+ .51	$x_{15} =$	+ .45	$x_{18} =$	+ .55							
$[wx^2] = 10.14$																		

Figure No. 33.

Observed Angles				Equations to be satisfied								Factor		
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1 = +1.80,$	$\lambda_1$					
					$x_1$	$+x_6$	$+x_{12}$	$=e_2 = -1.31,$	$\lambda_2$					
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = -0.41,$	$\lambda_3$					
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = +0.57,$	$\lambda_4$					
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = -1.08,$	$\lambda_5$					
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = -1.36,$	$\lambda_6$					
					$x_5 + x_6$	$+x_7 + x_8$	$+x_9 + x_{10}$	$=e_7 = +0.13,$	$\lambda_7$					
					$+0.65x_3 - 0.51x_2 + 0.61x_1 - 0.79x_{12} + 0.33x_{11} - 0.76x_{16}$ $+ 0.51x_{15} - 0.41x_{18} + 1.14x_{17} - 0.43x_{14} + 0.32x_{13} - 0.73x_4$								$=e_8 = +2.57,$	$\lambda_8$
1	58	46	38.23	.40										
2	62	57	31.06	.19										
3	57	9	56.84	.14										
4	53	42	22.30	.24										
5	59	52	34.56	.32										
6	69	25	13.77	.20										
7	55	38	3.43	.45										
8	49	9	49.64	.16										
9	71	59	2.06	.21										
10	53	55	16.67	.36										
11	71	35	48.82	.13										
12	51	48	7.43	.16										
13	72	22	20.22	.23										
14	66	42	45.06	.37										
15	62	59	45.45	.21										
16	52	46	8.18	.25										
17	41	18	12.57	.12										
18	67	50	26.36	.06										
Equations between the factors														
		No. of e		Value of e		Co-efficients of								
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	
1						+0.65						+0.32	-0.006	
2							+0.76					+0.20	+0.118	
3								+0.83				+0.45	-0.147	
4									+0.43			+0.16	+0.082	
5										+0.70		+0.21	-0.022	
6								*			+0.83	+0.36	-0.101	
7												+1.70		
8													+0.956	
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+1.791	+0.127	+0.287	+0.181	+0.155	+0.229	-0.512	+0.052	+2.631	0.4201208				
$\lambda_2 =$		+1.408	+0.114	+0.126	+0.073	+0.094	-0.260	-0.154	-2.230	0.3483049				
$\lambda_3 =$			+1.563	+0.168	+0.181	+0.282	-0.579	+0.248	-0.195	0.2900346				
$\lambda_4 =$				+2.499	+0.106	+0.138	-0.371	-0.186	+0.688	0.8375884				
$\lambda_5 =$					+1.525	+0.144	-0.315	+0.061	-1.559	0.1928461				
$\lambda_6 =$			*			+1.427	-0.462	+0.176	-1.453	0.1622656				
$\lambda_7 =$							+1.040	-0.085	+0.331	0.5198280				
$\lambda_8 =$								+1.139	+2.700	0.4313638				
Adopted angular errors in seconds														
$x_1 = -0.23$	$x_4 = -0.82$	$x_7 = +0.06$	$x_{10} = -0.40$	$x_{13} = -0.14$	$x_{16} = -0.56$									
$x_2 = +0.24$	$x_5 = +0.95$	$x_8 = +0.16$	$x_{11} = +0.09$	$x_{14} = -1.00$	$x_{17} = +0.18$									
$x_3 = +0.61$	$x_6 = -0.38$	$x_9 = -0.26$	$x_{12} = -0.70$	$x_{15} = +0.44$	$x_{18} = -0.03$									
$[wx^2] = 18.75$														

Figure No. 34.

Observed Angles					Equations to be satisfied					Factor	
No.	Value			Reciprocal Weight							
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$= e_1 = -1.31$	$\lambda_1$	
1	85	31	0.02	.41	$x_3$	$+x_4$	$-x_7$	$-x_8$	$= e_2 = +1.38$	$\lambda_2$	
2	35	3	11.26	.10	$x_1$	$+x_2$	$+x_3$	$+x_4$	} $= e_3 = -1.03$	$\lambda_3$	
3	30	34	52.44	.24	$x_5$	$+x_6$	$+x_7$	$+x_8$			
4	28	50	57.32	.11	$.08x_1$	$-1.43x_2$	$+1.69x_3$	$-1.82x_4$	} $= e_4 = +5.23$	$\lambda_4$	
5	34	49	49.38	.13	$1.44x_5$	$-.07x_6$	$+1.81x_7$	$-1.70x_8$			
6	85	44	23.27	.11							
7	28	56	42.59	.08							
8	30	29	5.13	.24							

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-1.31	+ .75	+ .27	- .289	$\lambda_1 =$	+1.5143	- .1284	- .2868	+ .2017	- .809	$\bar{1}.9079485$	
2	+1.38		+ .67	+ .03	+ .469	$\lambda_2 =$		+1.7324	- .0095	- .3421	+ .779	$\bar{1}.8915375$
3	-1.03	*		+1.42	+ .012	$\lambda_3 =$		*	+ .7590	- .0353	- .603	$\bar{1}.7803173$
4	+5.23				+2.483	$\lambda_4 =$				+ .4909	+1.868	$0.2713769$

Adopted angular errors in seconds

$x_1 = - .52$	$x_5 = + .39$
$x_2 = - .39$	$x_6 = + .01$
$x_3 = + .80$	$x_7 = + .16$
$x_4 = - .37$	$x_8 = - 1.11$

$[wx^2] = 12.54$

Figure No. 35.

Observed Angles				Equations to be satisfied						Factor	
No.	Value			Reciprocal Weight							
	o	'	"		$x_1$	$+ x_2$	$- x_5$	$- x_6$	$= e_1 = - 0.04,$	$\lambda_1$	
					$x_3$	$+ x_4$	$- x_7$	$- x_8$	$= e_2 = + 0.82,$	$\lambda_2$	
1	25	4	21.89	.09	$x_1$	$+ x_2$	$+ x_3$	$+ x_4 +$	} $= e_3 = - 2.00,$	$\lambda_3$	
2	62	34	3.02	.20	$x_5$	$+ x_6$	$+ x_7$	$+ x_8$			
3	62	12	20.06	.06	$2.14 x_1$	$- .52 x_2$	$+ .53 x_3$	$- 1.72 x_4 +$	} $= e_4 = + 1.19,$	$\lambda_4$	
4	30	9	15.05	.05	$1.01 x_5$	$- 1.07 x_6$	$+ .83 x_7$	$- 1.11 x_8$			
5	44	41	49.81	.15							
6	42	56	35.31	.07							
7	50	23	18.49	.10							
8	41	58	16.13	.16							

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	- .04	+ .51		+ .07	+ .012	$\lambda_1 =$	+ 1.9843	- .0667	- .1687	- .0165	+ 0.186	$\bar{1}.2695129$
2	+ .82		+ .37	- .15	+ .041	$\lambda_2 =$		+ 2.9200	+ .5051	- .1132	+ 1.251	0.0972573
3	- 2.00	*		+ .88	+ .017	$\lambda_3 =$		*	+ 1.2375	- .0356	- 2.096	0.3213913
4	+ 1.19				+ 1.130	$\lambda_4 =$				+ .8897	+ 1.038	0.0161974

Adopted angular errors in seconds

$x_1 = + .04$	$x_5 = - .18$
$x_2 = - .49$	$x_6 = - .24$
$x_3 = - .01$	$x_7 = - .24$
$x_4 = - .14$	$x_8 = - .73$

$[wx^2] = 6.46$

Figure No. 36.

Observed Angles					Equations to be satisfied							Factor	
No.	Value	Reciprocal Weight											
	°	'	"	$x_2$	$+x_3$	$+x_5$	$=e_1 = -$	$.96,$	$\lambda_1$				
				$x_1$	$+x_6$	$+x_{13}$	$=e_2 = -$	$.75,$	$\lambda_2$				
				$x_7$	$+x_{12}$	$+x_{19}$	$=e_3 = +$	$.95,$	$\lambda_3$				
				$x_8$	$+x_{18}$	$+x_{21}$	$=e_4 = -$	$.73,$	$\lambda_4$				
				$x_9$	$+x_{17}$	$+x_{20}$	$=e_5 = +$	$.15,$	$\lambda_5$				
				$x_{10}$	$+x_{15}$	$+x_{16}$	$=e_6 = -$	$.47,$	$\lambda_6$				
				$x_4$	$+x_{11}$	$+x_{14}$	$=e_7 = +$	$.48,$	$\lambda_7$				
				$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$+x_{11}$	$=e_8 = +$	$1.16,$	$\lambda_8$
1	41	20	42.05	.14	$\left. \begin{aligned} &+.61x_3 - .13x_2 + 1.14x_1 - .48x_{13} + .02x_{12} - 1.31x_{19} + .47x_{18} \\ &-.39x_{21} + .77x_{20} - .09x_{17} + 1.02x_{16} - .39x_{15} + .06x_{14} - 1.33x_4 \end{aligned} \right\} = e_9 = - .71, \lambda_9$								
2	82	40	18.73	.24									
3	58	33	4.45	.05									
4	37	2	26.99	.03									
5	38	46	37.32	.05									
6	74	23	2.33	.03									
7	51	23	8.08	.06									
8	46	36	4.82	.11									
9	32	15	33.10	.15									
10	66	57	52.26	.10									
11	49	37	43.25	.08									
12	91	21	3.72	.11									
13	64	16	16.29	.18									
14	93	19	51.49	.20									
15	68	39	51.66	.17									
16	44	22	16.82	.13									
17	95	15	13.81	.06									
18	64	35	51.56	.19									
19	37	15	50.54	.05									
20	52	29	14.41	.07									
21	68	48	4.96	.12									

Equations between the factors										
		Co-efficients of								
No. of e	Value of e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$
1	- .96	+.34							+.05	-.001
2	- .75		+.35						+.03	+.074
3	+.95			+.22					+.06	-.068
4	-.73				+.42				+.11	+.042
5	+.15					+.28			+.15	+.059
6	-.47		*				+.40		+.10	+.067
7	+.48							+.31	+.08	-.052
8	+1.16								+.58	
9	-.71									+.649

Values of the Factors											
Factor	Symbolical									Numerical	Logarithmic
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$		
$\lambda_1 =$	+.2995	+.035	+.095	+.098	+.201	+.095	+.092	-.369	-.017	-3.271	0.5146805
$\lambda_2 =$		+.2959	-.050	+.103	+.213	+.126	+.000	-.248	-.380	-2.420	0.3838154
$\lambda_3 =$			+.4874	+.118	+.238	+.077	+.249	-.641	+.498	+3.509	0.5451834
$\lambda_4 =$				+.2579	+.406	+.204	+.138	-.674	-.213	-2.543	0.4053464
$\lambda_5 =$					+.4405	+.420	+.281	-1.379	-.447	-1.111	0.0457141
$\lambda_6 =$			*			+.2719	+.113	-.654	-.330	-1.948	0.2895890
$\lambda_7 =$							+.3429	-.624	+.254	+.774	1.8887410
$\lambda_8 =$								+.2515	+.148	+3.044	0.4834446
$\lambda_9 =$									+.1742	+.076	2.8808136

Adopted angular errors in seconds						
$x_1 = -.33$	$x_4 = +.02$	$x_7 = +.39$	$x_{10} = +.11$	$x_{13} = -.44$	$x_{16} = -.24$	$x_{19} = +.17$
$x_2 = -.79$	$x_5 = -.01$	$x_8 = +.06$	$x_{11} = +.30$	$x_{14} = +.16$	$x_{17} = -.07$	$x_{20} = -.07$
$x_3 = -.16$	$x_6 = +.02$	$x_9 = +.29$	$x_{12} = +.39$	$x_{15} = -.34$	$x_{18} = -.48$	$x_{21} = -.31$

$[wx^2] = 14.73$



## PRINCIPAL TRIANGULATION. TRIANGLES.

### KARACHI LONGITUDINAL SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
61		(IV) (III) I	"	"	"	"	"	o' "			
			.34	+ .61	+ .013		+ .623	45 32 9.453	4.8060766,7	63984.78	12.118
			.34	- .29	+ .011		- .279	49 10 0.701	4.8314429,8	67833.31	12.847
			.34	+ 1.44	- .024		+ 1.416	85 17 49.846	4.9511023,0	89351.59	16.923
			1.02				+ 1.760	180 0 0.000			
62		(III) I IV	.39	+ .18	+ .032		+ .212	63 38 22.702	4.9098775,0	81260.13	15.390
			.39	+ .02	- .013		+ .007	71 29 16.267	4.9344859,9	85997.53	16.287
			.39	- .30	- .019		- .319	44 52 21.031	4.8060766,7	63984.78	12.118
			1.17				- .100	180 0 0.000			
63		I IV III	.44		+ .008			58 25 31.918	4.9009452,9	79605.91	15.077
			.45	+ .21	+ .020		+ .230	61 9 17.330	4.9129935,6	81845.26	15.501
			.45	- .76	- .028		- .788	60 25 10.752	4.9098775,0	81260.13	15.390
			1.34					180 0 0.000			
593		(IV) I II	.39	- .99		+ .020	- .970	45 4 53.870	4.8597773,1	72406.45	13.713
			.39	- .62		+ .013	- .607	93 21 34.173	5.0089274,6	102076.89	19.333
			.38	+ .32		- .033	+ .287	41 33 31.957	4.8314429,8	67833.31	12.847
			1.16				- 1.290	180 0 0.000			
594		I II III	.36	- .31		+ .016	- .294	51 25 45.876	4.8290877,3	67466.43	12.778
			.37	- .42		+ .004	- .416	71 31 35.754	4.9129935,6	81845.26	15.501
			.37	+ .01		- .020	- .010	57 2 38.370	4.8597773,1	72406.45	13.713
			1.10				- .720	180 0 0.000			

NOTES.—1. The values of the side are given in the same line with the opposite angle.  
2. (III) and (IV) appertain to base-lines figures.

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
64		IV III V	"	"	"	"	"	o' "			
			.26	+ .43	+ .020		+ .450	42 59 50.090	4.7357107,5	54414.01	10.306
			.27	- .15	- .018		- .168	50 53 53.192	4.7918257,8	61919.27	11.727
65		III V VI	.27	+ .11	- .002		+ .108	86 6 16.718	4.9009452,9	79605.91	15.077
			.80				+ .390	180 0 0.000			
			.30	+ .53	+ .003		+ .533	81 12 40.183	4.9151694,8	82256.35	15.579
66		V VI VIII	.30	+ .37	+ .018		+ .388	57 57 50.048	4.8485483,9	70558.34	13.363
			.30	+ .03	- .021		+ .009	40 49 29.769	4.7357107,5	54414.01	10.306
			.90				+ .930	180 0 0.000			
67	595	IV V VII	.64	- .18	+ .013		- .167	79 49 12.553	5.0719977,1	118031.44	22.354
			.64	- .07	- .004		- .074	56 52 15.406	5.0018433,6	100425.35	19.020
			.64	- .54	- .009		- .549	43 18 32.041	4.9151694,8	82256.35	15.579
68	596	V VII VIII	1.92				- .790	180 0 0.000			
			.45	- .41		+ .032	- .378	66 9 58.142	4.9769035,9	94820.80	17.958
			.45	- .24		- .011	- .251	77 9 18.989	5.0046088,5	101066.87	19.141
69		VI VIII IX	.45	+ .16		- .021	+ .139	36 40 42.869	4.7918257,8	61919.27	11.727
			1.35				- .490	180 0 0.000			
			.64	- .00		- .018	- .018	58 57 19.392	4.9831815,7	96201.44	18.220
70		VIII IX XI	.65	- .18		+ .026	- .154	63 25 45.896	5.0018433,6	100425.35	19.020
			.64	+ .06		- .008	+ .052	57 36 54.712	4.9769035,9	94820.80	17.958
			1.93				- .120	180 0 0.000			
71		IX XI XIII	1.23	+ .48	+ .011		+ .491	49 29 33.501	5.1215489,2	132296.68	25.056
			1.23	+ .58	+ .018		+ .598	87 47 36.198	5.2402288,4	173871.66	32.930
			1.23	+ .65	- .029		+ .621	42 42 50.301	5.0719977,1	118031.44	22.354
72		IX XI XIII	3.69				+ 1.710	180 0 0.000			
			.92	- .29	+ .021		- .269	43 15 33.741	4.9833200,7	96232.13	18.226
			.92	- .59	- .017		- .607	66 19 41.473	5.1092672,0	128607.77	24.358
73		XI XIII	.92	- .20	- .004		- .204	70 24 44.786	5.1215489,2	132296.68	25.056
			2.76				- 1.080	180 0 0.000			
			.73		- .001			79 20 20.139	5.0916670,7	123500.20	23.390
74		XI XIII XIV	.73	+ .15	+ .018		+ .168	50 41 12.048	4.9877976,9	97229.42	18.415
			.72	+ .83	- .017		+ .813	49 58 27.813	4.9833200,7	96232.13	18.226
			2.18					180 0 0.000			
75		XIII XVI	.92	- .03	+ .015		- .015	51 37 54.865	5.0280188,6	106664.24	20.202
			.93	- .31	- .013		- .323	63 9 58.347	5.0842015,6	121395.21	22.992
			.93	- .19	- .002		- .192	65 12 6.788	5.0916670,7	123500.20	23.390
76		XIII XVI	2.78				- .530	180 0 0.000			
			.59	- .16	+ .099		- .061	48 7 43.769	4.9181115,8	82815.49	15.685
			.59	+ .15	- .143		+ .007	58 19 1.887	4.9760744,7	94639.95	17.924
158		XIII XVI XV	.60	- .14	+ .044		- .096	73 33 14.344	5.0280188,6	106664.24	20.202
			1.78				- .150	180 0 0.000			
			.87	- .21	- .174		- .384	55 44 49.066	5.0681407,0	116987.84	22.157
159		XIII XVI XV	.87	+ .01	+ .048		+ .058	82 17 20.338	5.1469214,0	140255.99	26.564
			.86	- .20	+ .126		- .074	41 57 50.596	4.9760744,7	94639.95	17.924
			2.60				- .400	180 0 0.000			

KARACHI LONGITUDINAL SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
597	VI IX X	"	"	"	"	"	o' "				
		1'93	+ '22		- '025	+ '195	49 30 35'455	5'1779794,3	150653'57	28'533	
		1'93	+ '04		+ '058	+ '098	69 7 15'518	5'2673728,2	185085'67	35'054	
		1'93	+ '28		- '033	+ '247	61 22 9'027	5'2402288,4	173871'66	32'930	
		5'79				+ '540	180 0 0'000				
598	X IX XII	'91	+ '26		- '028	+ '232	67 5 49'942	5'1492051,0	140995'45	26'704	
		'91	- '17		+ '059	- '111	33 4 48'119	4'9219084,3	83542'68	15'822	
		'92	+ '13		- '031	+ '099	79 49 21'939	5'1779794,3	150653'57	28'533	
		2'74				+ '220	180 0 0'000				
599	IX XII XIII	1'01	- '46		- '070	- '530	69 24 57'720	5'1471640,2	140334'36	26'578	
		1'01	- '01		+ '051	+ '041	40 26 12'461	4'9877976,9	97229'42	18'415	
		1'02	- 1'02		+ '019	- 1'001	70 8 49'819	5'1492051,0	140995'45	26'704	
		3'04				- 1'490	180 0 0'000				
600	XII XIII XV	1'48	+ '18		- '140	+ '040	53 33 39'140	5'1469214,0	140255'99	26'564	
		1'49	+ '46		+ '086	+ '546	72 50 5'566	5'2216133,8	166576'35	31'549	
		1'48	+ '30		+ '054	+ '354	53 36 15'294	5'1471640,2	140334'36	26'578	
		4'45				+ '940	180 0 0'000				
159	XV XVI XVII	'77	- '05	- '046		- '096	85 0 4'644	5'1394110,2	137851'34	26'108	
		'77	+ '34	+ '023		+ '363	37 16 52'633	4'9233440,3	83819'29	15'875	
		'77	- '13	+ '023		- '107	57 43 2'723	5'0681407,0	116987'84	22'157	
		2'31				+ '160	180 0 0'000				
160	XVI XVII XVIII	'89	+ '08	- '029		+ '051	51 51 26'001	5'0418681,0	110120'48	20'856	
		'89	+ '13	- '027		+ '103	48 14 6'703	5'0188557,4	104437'32	19'780	
		'90	+ '13	+ '056		+ '186	79 54 27'296	5'1394110,2	137851'34	26'108	
		2'68				+ '340	180 0 0'000				
649	XV XVI XVIII	'96	- '05		- '029	- '079	42 8 15'121	5'0188557,4	104437'32	19'780	
		'97	+ '42		- '006	+ '414	89 8 19'324	5'1921407,5	155647'01	29'479	
		'96	+ '24		+ '035	+ '275	48 43 25'555	5'0681407,0	116987'84	22'157	
		2'89				+ '610	180 0 0'000				
161	XVII XVIII XIX	'61	- '66	- '043		- '703	113 44 10'017	5'1967309,9	157300'83	29'792	
		'60	+ '63	- '014		+ '616	26 24 32'786	4'8832586,9	76429'09	14'475	
		'61	- '59	+ '057		- '533	39 51 17'197	5'0418681,0	110120'48	20'856	
		1'82				- '620	180 0 0'000				
162	XVIII XIX XX	'96	+ '80	- '059		+ '741	41 54 44'311	5'0215104,4	105077'67	19'901	
		'97	+ '07	- '022		+ '048	47 44 30'208	5'0660415,9	116423'75	22'050	
		'97	+ '47	+ '081		+ '551	90 20 45'481	5'1967309,9	157300'83	29'792	
		2'90				+ 1'340	180 0 0'000				
650	XVII XVIII XX	'94	+ '14		- '025	+ '115	58 11 13'575	5'0660415,9	116423'75	22'050	
		'94	+ 1'43		- '073	+ 1'357	68 19 17'717	5'1048809,1	127315'40	24'113	
		'94	+ 1'03		+ '098	+ 1'128	53 29 28'708	5'0418681,0	110120'48	20'856	
		2'82				+ 2'600	180 0 0'000				
163	XIX XX XXI	'97	- '34	- '031		- '371	73 2 17'159	5'1324806,8	135669'03	25'695	
		'97	+ 1'15	+ '012		+ 1'162	59 9 37'282	5'0855898,2	121783'88	23'065	
		'96	- '18	+ '019		- '161	47 48 5'559	5'0215104,4	105077'67	19'901	
		2'90				+ '630	180 0 0'000				

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance				
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log: feet	Feet	Miles		
164	651	XX	"	"	"	"	"	o' "					
		XXI	.63	+ .23	-.005		+ .225	55 40 46.455	5.0499755,3	112195.52	21.249		
		XXII	.62	- .16	-.014		- .174	31 23 19.466	4.8497553,7	70754.72	13.401		
			.63	+ .43	+ .019		+ .449	92 55 54.079	5.1324806,8	135669.03	25.695		
			1.88				+ .500	180 0 0.000					
			XIX	.53	+ .10		-.023	+ .077	25 28 10.177	4.8497553,7	70754.72	13.401	
			XX	.54	+ 1.38		+ .007	+ 1.387	114 50 24.797	5.1740945,7	149311.95	28.279	
			XXII	.53	+ .64		+ .016	+ .656	39 41 25.026	5.0215104,4	105077.67	19.901	
			1.60				+ 2.120	180 0 0.000					
		165		XXII	.61	- .22	-.046		- .266	46 37 47.644	4.9214691,1	83458.21	15.806
				XXI	.61	+ .95	-.041		+ .909	55 37 4.329	4.9765810,1	94750.39	17.945
				XXIII	.61	+ .75	+ .087		+ .837	77 45 8.027	5.0499755,3	112195.52	21.249
	1.83						+ 1.480	180 0 0.000					
166				XXI	.40	- .33	-.083		- .413	74 13 4.597	4.9525353,7	89646.91	16.979
				XXIII	.39	- .83	+ .067		- .763	42 9 41.307	4.7960898,2	62530.20	11.843
		XXIV	.40	+ .08	+ .016		+ .096	63 37 14.096	4.9214691,1	83458.21	15.806		
			1.19				- 1.080	180 0 0.000					
		167		XXIV	.45	- .51	-.120		- .630	58 42 43.220	4.9113452,8	81535.22	15.442
				XXIII	.45	- .26	+ .099		- .161	51 18 20.949	4.8719683,0	74467.76	14.104
XXV	.45			- .10	+ .021		- .079	69 58 55.831	4.9525353,7	89646.91	16.979		
	1.35						- .870	180 0 0.000					
168				XXV	.54	- .45	-.095		- .545	40 18 10.595	4.9344920,7	85998.73	16.288
				XXIII	.54	- .18	+ .012		- .168	101 52 17.962	5.1143126,0	130110.57	24.642
		XXVI	.54	- .19	+ .083		- .107	37 49 31.443	4.9113452,8	81535.22	15.442		
			1.62				- .820	180 0 0.000					
		652		XXII	.64	+ 1.35		-.062	+ 1.288	43 37 13.488	4.9344920,7	85998.73	16.288
				XXIII	.65	+ .86		-.265	+ .595	86 54 29.115	5.0950874,1	124476.51	23.575
XXVI	.64			- .05		+ .327	+ .277	49 28 17.397	4.9765810,1	94750.39	17.945		
	1.93						+ 2.160	180 0 0.000					
263				XXVI	1.19	+ .98	+ .009		+ .989	89 12 55.219	5.2379367,0	172956.41	32.757
				XXV	1.18	+ .40	-.050		+ .350	42 0 11.060	5.0635141,4	115748.17	21.922
		XXVIII	1.19	+ .75	+ .041		+ .791	48 46 53.721	5.1143126,0	130110.57	24.642		
			3.56				+ 2.130	180 0 0.000					
		264		XXV	.98	- .23	-.039		- .269	43 44 58.851	5.0841685,3	121385.99	22.990
				XXVIII	.98	+ .12	+ .046		+ .166	36 24 43.946	5.0178575,0	104197.55	19.734
XXVII	.99			- .09	-.007		- .097	99 50 17.203	5.2379367,0	172956.41	32.757		
	2.95						- .200	180 0 0.000					
681				XXV	1.07	+ .17		-.089	+ .081	85 45 11.001	5.2056239,5	160555.04	30.408
				XXVI	1.06	+ .42		+ .041	+ .461	40 19 51.301	5.0178575,0	104197.55	19.734
		XXVII	1.07	- .04		+ .048	+ .008	53 54 57.698	5.1143126,0	130110.57	24.642		
			3.20				+ .550	180 0 0.000					
		265		XXVIII	1.14	- .63	+ .007		- .623	80 10 28.657	5.1915425,1	155432.75	29.438
				XXVII	1.13	- .68	-.053		- .733	49 30 58.827	5.0791110,4	119980.59	22.724
XXIX	1.13			- .24	+ .046		- .194	50 18 32.516	5.0841685,3	121385.99	22.990		
	3.40						- 1.550	180 0 0.000					

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No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
266		XXVII	"	"	"	"	"	o' "			
		XXIX	'99	+ '12	- '033		+ '087	59 24 55'967	5'1290445,1	134599'82	25'492
		XXX	'99	+ '07	+ '040		+ '110	36 47 55'170	4'9715322,3	93055'27	17'738
			'99	+ '23	- '007		+ '223	83 47 8'863	5'1915425,1	155432'75	29'438
			2'97				+ '420	180 0 0'000			
267		XXX	1'31	+ '04	- '039		+ '001	59 17 26'641	5'1383141,5	137503'62	26'042
		XXIX	1'31	- '18	+ '033		- '147	03 23 54'293	5'1553384,4	143000'80	27'083
		XXXII	1'30	- '33	+ '006		- '324	57 18 39'066	5'1290445,1	134599'82	25'492
			3'92				- '470	180 0 0'000			
268		XXIX	1'33	+ '01	+ '005		+ '015	63 35 12'855	5'1598054,6	144479'25	27'363
		XXXII	1'32	+ '21	- '035		+ '175	57 56 34'105	5'1358358,4	136721'21	25'894
		XXXIII	1'33	- '07	+ '030		- '040	58 28 13'040	5'1383141,5	137503'62	26'042
			3'98				+ '150	180 0 0'000			
682		XXVIII	1'45	- '47		+ '020	- '450	58 55 28'270	5'1921624,9	155654'80	29'480
		XXIX	1'45	- '07		- '064	- '134	79 45 39'616	5'2524693,2	178841'91	33'872
		XXXI	1'45	+ '36		+ '044	+ '404	41 18 52'114	5'0791110,4	119980'59	22'724
			4'35				- '180	180 0 0'000			
683		XXIX	1'54	- '15		- '060	- '210	66 8 37'800	5'2050256,1	160333'99	30'366
		XXXI	1'53	- '33		+ '022	- '308	51 14 56'382	5'1358358,4	136721'21	25'894
		XXXIII	1'54	+ '13		+ '038	+ '168	62 36 25'818	5'1921624,9	155654'80	29'480
			4'61				- '350	180 0 0'000			
269		XXXIII	'85	+ '24	+ '003		+ '243	54 1 3'453	5'0686944,6	117137'11	22'185
		XXXII	'85	- '58	- '017		- '597	39 31 57'743	4'9644508,4	92140'56	17'451
		XXXIV	'85	+ '03	+ '014		+ '044	86 26 58'804	5'1598054,6	144479'25	27'363
			2'55				- '310	180 0 0'000			
270		XXXII	'88	+ '50	- '013		+ '487	72 4 5'337	5'1083222,6	128328'24	24'305
		XXXIV	'87	+ '59	+ '015		+ '605	47 39 9'215	4'9986361,3	99086'45	18'880
		XXXV	'88	+ '45	- '002		+ '448	60 16 45'448	5'0686944,6	117137'11	22'185
			2'63				+ '1540	180 0 0'000			
271		XXXV	'83	- '06	- '013		- '073	67 12 15'937	5'0958844,3	124705'15	23'618
		XXXIV	'83	- '21	+ '017		- '193	41 13 53'957	4'9501584,9	80157'63	16'886
		XXXVII	'84	- '41	- '004		- '414	71 33 50'106	5'1083222,6	128328'24	24'305
			2'50				- '1680	180 0 0'000			
272		XXXIV	1'14	+ '06	+ '006		+ '066	73 17 9'716	5'1649709,6	146207'93	27'691
		XXXVII	1'13	+ '11	- '017		+ '093	51 56 19'353	5'0798864,9	120195'02	22'764
		XXXVIII	1'13	- '30	+ '011		- '289	54 46 30'931	5'0958844,3	124705'15	23'618
			3'40				- '130	180 0 0'000			
684		XXXIII	'45	- '11		+ '018	- '092	49 48 52'908	4'8684116,8	73860'40	13'989
		XXXIV	'45	+ '15		- '028	+ '122	57 48 50'442	4'9128765,2	81823'21	15'497
		XXXVI	'46	+ '21		+ '010	+ '220	72 22 16'650	4'9644508,4	92140'56	17'451
			1'36				+ '250	180 0 0'000			
685		XXXIV	'56	- '27		- '024	- '294	53 33 53'166	4'9855702,5	96732'01	18'320
		XXXVI	'57	- '31		+ '017	- '293	88 32 2'057	5'0798864,9	120195'02	22'764
		XXXVIII	'56	+ '01		+ '007	+ '017	37 54 4'777	4'8684116,8	73860'40	13'989
			1'69				- '570	180 0 0'000			

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
273		XXXVIII	"	"	"	"	"	o' ' "			
		XXXVII	.63	- .12	+ .004		- .116	38 5 33.384	4.9735392,4	94089.07	17.820
		XXXIX	.62	+ .00	- .013		- .013	35 22 40.377	4.9459537,3	88298.58	16.723
			.63	- .35	+ .009		- .341	106 31 46.239	5.1649709,6	146207.93	27.691
			1.88				- .470	180 0 0.000			
274		XXXVII	1.00	+ .13	- .009		+ .121	80 54 27.031	5.1841945,1	152825.04	28.944
		XXXIX	1.00	+ .05	+ .011		+ .061	61 39 9.241	5.1342105,9	136210.50	25.797
		XL	.99	+ .12	- .002		+ .118	37 26 23.728	4.9735392,4	94089.07	17.820
			2.99				+ .300	180 0 0.000			
275		XXXIX	1.11	+ .19	+ .011		+ .201	43 24 40.311	5.0314494,3	107510.13	20.362
		XL	1.11	+ .45	- .017		+ .433	58 55 47.533	5.1270933,9	133996.48	25.378
		XLII	1.11	+ .20	+ .006		+ .206	77 39 32.156	5.1841945,1	152825.04	28.944
			3.33				+ .840	180 0 0.000			
276		XL	1.05	- .06	- .003		- .063	54 36 16.307	5.0971226,5	125061.22	23.686
		XLII	1.05	- .23	+ .012		- .218	80 54 23.342	5.1803796,3	151488.48	28.691
		XLIII	1.04	- .11	- .009		- .119	44 29 20.351	5.0314494,3	107510.13	20.362
			3.14				- .400	180 0 0.000			
277		XLII	1.14	- .18	+ .012		- .168	64 34 41.492	5.1300884,6	134923.78	25.554
		XLIII	1.14	- .06	- .012		- .072	58 34 52.138	5.1054600,5	127485.28	24.145
		XLIV	1.13	- .02	- .000		- .020	56 50 26.370	5.0971226,5	125061.22	23.686
			3.41				- .260	180 0 0.000			
686		XXXVIII	.96	- .02		+ .015	- .005	64 51 49.485	5.1475243,7	140450.86	26.601
		XXXIX	.97	- .46		- .023	- .483	80 26 44.597	5.1846654,2	152990.85	28.976
		XLI	.96	- .19		+ .008	- .182	34 41 25.918	4.9459537,3	88298.58	16.723
			2.89				- .670	180 0 0.000			
687		XXXIX	1.38	+ .14		- .008	+ .132	67 57 34.522	5.1860577,4	153482.10	29.069
		XLI	1.37	+ .08		+ .017	+ .097	54 1 18.477	5.1270933,9	133996.48	25.378
		XLII	1.38	+ .08		- .009	+ .071	58 1 7.001	5.1475243,7	140450.86	26.601
			4.13				+ .300	180 0 0.000			
688		XLI	1.51	+ .28		+ .021	+ .301	44 9 33.021	5.1054600,5	127485.28	24.145
		XLII	1.52	+ .03		- .021	+ .009	78 50 9.809	5.2541461,0	179533.76	34.003
		XLIV	1.51	+ .09		+ .000	+ .090	57 0 17.170	5.1860577,4	153482.10	29.069
			4.54				+ .400	180 0 0.000			
278		XLIV	.68	+ .15	+ .013		+ .163	67 23 32.453	5.0994649,3	125737.52	23.814
		XLIII	.68	- .15	- .018		- .168	30 28 5.572	4.8392480,3	69063.42	13.080
		XLV	.68	+ .04	+ .005		+ .045	82 8 21.975	5.1300884,6	134923.78	25.554
			2.04				+ .040	180 0 0.000			
279		XLIII	.63	- .02	+ .007		- .013	42 10 53.317	4.9265618,1	84442.64	15.993
		XLV	.63	- .09	+ .005		- .085	48 47 43.855	4.9759556,9	94614.06	17.919
		XLVI	.63	- .23	- .012		- .242	89 1 22.828	5.0994649,3	125737.52	23.814
			1.89				- .340	180 0 0.000			
280		XLVI	.28	- .30	+ .001		- .299	65 15 10.471	4.8884804,0	77353.57	14.650
		XLV	.27	- .29	+ .008		- .282	32 16 11.248	4.6577812,5	45475.89	8.613
		XLVIII	.28	- .47	- .009		- .479	82 28 38.281	4.9265618,1	84442.64	15.993
			.83				- 1.060	180 0 0.000			

KARACHI LONGITUDINAL SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
281		XLV XLVIII XLIX	"	"	"	"	"	o' "			
			'33	+ '26	+ '017		+ '277	61 43 55'367	4'8603274,8	72408'25	13'731
			'33	+ '14	- '013		+ '127	48 15 43'727	4'7883329,6	61423'28	11'633
			'33	+ '08	- '004		+ '076	70 0 20'906	4'8884804,0	77353'57	14'650
			0'99			+ '480	180 0 0'000				
282		XLVIII XLIX LI	'37	+ '07	+ '011		+ '081	52 41 23'481	4'8371805,2	68735'41	13'018
			'37	- '02	+ '008		- '012	70 17 6'748	4'9103800,0	81354'21	15'408
			'37	- '19	- '019		- '209	57 1 29'771	4'8603274,8	72408'25	13'731
			1'11				- '140	180 0 0'000			
283		XLIX LI LII	'27	+ '36	+ '021		+ '381	52 58 26'451	4'7725122,3	59225'98	11'217
			'28	+ '31	- '011		+ '299	59 7 22'319	4'8039359,2	63670'16	12'059
			'28	+ '22	- '010		+ '210	67 54 11'230	4'8371805,2	68735'41	13'018
			'81				+ '890	180 0 0'000			
689		XLIV XLV XLVII	'25	+ '47		+ '023	+ '493	46 30 49'313	4'7213967,6	52649'80	9'972
			'25	+ '26		- '030	+ '230	61 21 42'260	4'8040638,4	63688'92	12'062
			'26	+ '29		+ '007	+ '297	72 7 28'427	4'8392480,3	69063'42	13'080
			'76				+ 1'020	180 0 0'000			
690		XLV XLVII XLIX	'25	- '11		- '005	- '115	73 42 2'885	4'8374121,1	68772'07	13'025
			'24	- '11		+ '005	- '105	59 0 31'755	4'7883329,6	61423'28	11'633
			'24	+ '01		+ '000	+ '010	47 17 25'360	4'7213967,6	52649'80	9'972
			'73				- '210	180 0 0'000			
691		XLVII XLIX L	'31	- '14		+ '033	- '107	54 52 37'743	4'8067441,9	64083'20	12'137
			'32	- '07		- '014	- '084	63 44 55'566	4'8467594,0	70268'29	13'308
			'31	- '06		- '019	- '079	61 22 26'691	4'8374121,1	68772'07	13'025
			'94				- '270	180 0 0'000			
692		XLIX L LII	'26	- '52		- '011	- '531	55 41 43'179	4'7758111,0	59677'56	11'303
			'27	- '32		+ '025	- '295	61 48 6'145	4'8039359,2	63670'16	12'059
			'27	- '37		- '014	- '384	62 30 10'676	4'8067441,9	64083'20	12'137
			'80				- 1'210	180 0 0'000			
284		LII LI LIII	'24	- '49	+ '037		- '453	55 22 58'047	4'7537242,9	56718'44	10'742
			'24	- '09	- '015		- '105	65 22 25'025	4'7909275,4	62650'93	11'866
			'24	- '27	- '022		- '292	59 14 36'928	4'7725122,3	59225'98	11'217
			'72				- '850	180 0 0'000			
285		LI LIII LIV	'20	+ '83	+ '020		+ '850	62 31 55'960	4'7447882,9	55563'33	10'523
			'19	+ '46	+ '009		+ '469	52 32 52'479	4'6964774,0	49713'85	9'416
			'20	+ '66	- '029		+ '631	64 55 11'561	4'7537242,9	56718'44	10'742
			'59				+ 1'950	180 0 0'000			
286		LIV LIII LVI	'31	- '08	+ '029		- '051	64 55 5'809	4'8676236,3	73726'50	13'963
			'31	- '10	+ '019		- '081	72 2 11'249	4'8889332,9	77434'28	14'666
			'30	+ '54	- '048		+ '492	43 2 42'942	4'7447882,9	55563'33	10'523
			'92				+ '360	180 0 0'000			
287		LIII LVI LVII	'33	- '19	+ '036		- '154	60 49 29'706	4'8471599,5	70333'14	13'321
			'32	- '88	- '012		- '892	52 55 56'448	4'8080406,9	64274'79	12'173
			'33	+ '17	- '024		+ '146	66 14 33'846	4'8676236,3	73726'50	13'963
			0'98				- '900	180 0 0'000			

PRINCIPAL TRIANGULATION—TRIANGLES

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles	
288	693	LII	25	+ 25		+ 073	+ 323	54 14 17.933	4.7590265,9	57415.16	10.874	
		LIII	26	+ 15		- 029	+ 121	63 27 15.931	4.8013810,2	63296.69	11.088	
		LV	25	+ 44		- 044	+ 396	62 18 26.136	4.7969275,4	62650.93	11.866	
	694	LIII		76				+ 840	180 0 0.000			
			LV	23	+ 08		- 013	+ 067	51 53 32.147	4.7291535,7	53598.61	10.151
			LVII	23	+ 33		+ 053	+ 383	70 39 43.953	4.8080406,9	64274.79	12.173
		LVII		23	+ 00		- 040	- 040	57 26 43.900	4.7590265,9	57415.16	10.874
				69				+ 410	180 0 0.000			
				24	- 90	+ 023		- 877	60 25 35.193	4.7984422,6	62869.82	11.907
	289	LVI		23	- 69	- 011		- 701	42 55 33.559	4.6922424,2	49231.42	9.324
				24	- 47	- 012		- 482	76 38 51.248	4.8471599,5	70333.14	13.321
				71				- 2060	180 0 0.000			
LVIII			20	+ 19	+ 022		+ 212	56 22 50.522	4.7332001,6	54100.36	10.246	
			20	+ 31	- 003		+ 307	48 13 2.227	4.6852441,6	48444.46	9.175	
			20	+ 18	- 019		+ 161	75 24 7.251	4.7984422,6	62869.82	11.907	
290	LIX		60				+ 680	180 0 0.000				
			20	- 02	+ 022		+ 002	62 9 11.992	4.7382615,5	54734.55	10.366	
			19	- 03	+ 003		- 027	56 55 30.093	4.7149324,9	51871.94	9.824	
	LVIII		20	- 08	- 025		- 105	60 55 17.915	4.7332001,6	54100.36	10.246	
			59				- 130	180 0 0.000				
			24	- 17	+ 026		- 144	69 58 23.836	4.8169046,0	65600.12	12.424	
291	LXI		24	- 13	+ 005		- 125	58 24 22.565	4.7743221,6	59473.32	11.264	
			24	- 36	- 031		- 391	51 37 13.599	4.7382615,5	54734.55	10.366	
			72				- 660	180 0 0.000				
	LVII		19	+ 01		+ 058	+ 068	64 23 25.738	4.7346350,2	54279.40	10.280	
			18	+ 26		- 006	+ 254	60 44 4.804	4.7202420,4	52510.00	9.945	
			18	+ 20		- 052	+ 148	54 52 29.458	4.6922424,2	49231.42	9.324	
292	LVIII		55				+ 470	180 0 0.000				
			18	+ 60		- 008	+ 592	47 30 6.562	4.6633350,7	46061.18	8.724	
			19	+ 21		+ 048	+ 258	72 10 23.508	4.7743221,6	59473.32	11.264	
	LX		19	+ 39		- 040	+ 350	60 19 29.930	4.7346350,2	54279.40	10.280	
			56				+ 1200	180 0 0.000				
			30	+ 10	+ 027		+ 127	59 46 44.107	4.8179695,5	65761.17	12.455	
293	LXII		30	+ 26	- 002		+ 258	60 40 55.908	4.8218859,2	66356.88	12.568	
			29	+ 20	- 025		+ 175	59 32 19.985	4.8169046,0	65600.12	12.424	
			89				+ 560	180 0 0.000				
	LXIII		29	- 01	+ 024		+ 014	64 59 59.464	4.8320418,2	67926.91	12.865	
			28	+ 03	+ 004		+ 034	53 40 6.874	4.7808879,7	60379.29	11.435	
			28	+ 29	- 028		+ 262	61 19 53.662	4.8179695,5	65761.17	12.455	
294	LXIV		85				+ 310	180 0 0.000				
			22	- 50	+ 025		- 475	56 25 4.425	4.7615541,1	57750.28	10.938	
			22	- 24	- 006		- 246	45 5 21.314	4.6910205,8	49093.11	9.298	
	LXVII		22	- 11	- 019		- 129	78 29 34.261	4.8320418,2	67926.91	12.865	
			66				- 850	180 0 0.000				
			20	+ 17	+ 027		+ 197	65 9 3.477	4.7606922,6	57635.79	10.916	
295	LXVIII		20	+ 21	- 007		+ 203	49 27 4.153	4.6836137,6	48262.94	9.141	
			20	+ 31	- 020		+ 290	65 23 52.370	4.7615541,1	57750.28	10.938	
			60				+ 690	180 0 0.000				



KARACHI LONGITUDINAL SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
697		LXI LXIII LXIV	"	"	"	"	"	o' "			
			'21	+ '05		+ '018	+ '068	37 31 10'048	4'6274055,5	42403'88	8'031
			'21	- '32		- '004	- '324	70 6 19'946	4'8160424,8	65470'03	12'400
698		LXIII LXIV LXVI	'21	- '33		- '014	- '344	72 22 30'006	4'8218859,2	66356'88	12'568
			'63				- '600	180 0 0'000			
			'15	+ '26		+ '004	+ '264	66 26 47'054	4'6082549,6	49917'74	9'454
296		LXVII LXVI LXIX	'15	+ '65		+ '012	+ '662	62 24 42'042	4'6836137,6	48262'94	9'141
			'14	+ '14		- '016	+ '124	51 8 30'904	4'6274055,5	42403'88	8'031
			'44				+ 1'050	180 0 0'000			
297		LXVI LXIX LXVIII	'38	- '15	+ '017		- '133	83 5 39'237	4'9826046,3	96073'72	18'196
			'38	- 1'18	+ '016		- 1'164	60 21 11'556	4'9248321,5	84107'01	15'929
			'38	+ '61	- '033		+ '577	36 33 9'207	4'7606922,6	57635'79	10'916
299		LXVI LXIX LXVIII	1'14				- '720	180 0 0'000			
			'16	+ '59	+ '044		+ '634	23 49 29'594	4'7206329,0	52557'28	9'954
			'16	- '15	- '042		- '192	23 46 13'398	4'7196961,6	52444'04	9'933
699		LXVI LXVII LXVIII	'16	+ '01	- '002		+ '008	132 24 17'008	4'9826046,3	96073'72	18'196
			'48				+ '450	180 0 0'000			
			'24	- '59		+ '060	- '530	84 10 41'450	4'8685587,7	73885'42	13'993
298		LXVIII LXIX LXX	'23	- '03		- '048	- '078	44 55 18'562	4'7196961,6	52444'04	9'933
			'24	- '22		- '012	- '232	50 53 59'988	4'7606922,6	57635'79	10'916
			'71				- '840	180 0 0'000			
299		LXIX LXX LXXI	'32	- '26	+ '020		- '240	86 1 36'530	4'9540225,5	89954'43	17'037
			'32	- '24	+ '009		- '231	58 19 16'089	4'8849996,2	76736'08	14'533
			'31	- '09	- '029		- '119	35 39 7'381	4'7206329,0	52557'28	9'954
700		LXVIII LXIX LXXI	'95				- '590	180 0 0'000			
			'18	+ '36	+ '034		+ '394	30 27 21'984	4'7292814,1	53614'40	10'154
			'17	+ '42	- '025		+ '395	27 48 13'235	4'6931768,1	49337'47	9'344
300		LXXI LXX LXXIII	'18	+ '35	- '009		+ '341	121 44 24'781	4'9540225,5	89954'43	17'037
			'53				+ 1'130	180 0 0'000			
			'20	- '09		- '012	- '102	43 45 44'688	4'6031768,1	49337'47	9'344
301		LXX LXXIII LXXII	'21	+ '12		+ '043	+ '163	88 46 38'363	4'8531793,0	71314'74	13'507
			'20	+ '18		- '031	+ '149	47 27 36'949	4'7206329,0	52557'28	9'954
			'61				+ '210	180 0 0'000			
701		LXXI LXX LXXIII	'36	- '40	+ '028		- '372	79 51 23'498	4'9673728,9	92762'59	17'569
			'36	- '34	+ '029		- '311	65 28 1'559	4'9331237,5	85728'21	16'236
			'35	+ '52	- '057		+ '463	34 40 34'943	4'7292814,1	53614'40	10'154
302		LXXIII LXXII LXXV	1'07				- '220	180 0 0'000			
			'33	+ '41	+ '049		+ '459	40 31 35'149	4'7801560,6	60277'74	11'416
			'33	- '18	- '034		- '214	49 11 36'496	4'8464283,8	70214'75	13'298
702		LXX LXXI LXXII	'34	- '11	- '015		- '125	90 16 48'355	4'9673728,9	92762'59	17'569
			1'00				+ '120	180 0 0'000			
			'29	+ '07		+ '078	+ '148	105 59 37'108	4'9973586,1	99393'64	18'825
302		LXXIII LXXII LXXV	'29	+ '28		- '018	+ '262	42 46 20'322	4'8464283,8	70214'75	13'298
			'28	- '67		- '060	- '730	31 14 2'570	4'7292814,1	53614'40	10'154
			'86				- '320	180 0 0'000			
302		LXXIII LXXII LXXV	'26	+ '43	+ '015		+ '445	73 35 29'385	4'8479917,6	70467'98	13'346
			'26	+ '10	+ '013		+ '113	51 16 5'663	4'7581911,6	57304'82	10'853
			'26	+ '25	- '028		+ '222	55 8 24'952	4'7801560,6	60277'74	11'416
302		LXXIII LXXII LXXV	'78				+ '780	180 0 0'000			

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance				
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles		
303	702	LXXII LXXV LXXIV	"	"	"	"	"	o' "					
			'31	- '10	+ '040		- '060	47 27 50'090	4'7708428,8	58998'75	11'174		
			'31	- '06	- '015		- '075	70 52 56'685	4'8788249,6	75652'79	14'328		
				'31	- '24	- '025		- '265	61 39 13'225	4'8479917,6	70467'98	13'346	
				'93				- '400	180 0 0'000				
				LXXII LXXIII LXXIV	'36	- '00		+ '053	+ '053	98 43 55'963	5'0155298,3	103640'58	19'629
					'35	+ '05		- '018	+ '032	46 10 40'122	4'8788249,6	75652'79	14'328
					'35	- '16		- '035	- '195	35 5 23'915	4'7801569,6	60277'74	11'416
				'06				- '110	180 0 0'000				
		304	702	LXXV LXXIV LXXVI	'21	+ '33	+ '048		+ '378	45 4 39'828	4'6784239,7	47689'63	9'032
					'22	+ '05	+ '001		+ '051	73 45 41'631	4'8106699,7	64665'10	12'247
					'21	+ '05	- '049		+ '001	61 9 38'541	4'7708428,8	58998'75	11'174
				'64				+ '430	180 0 0'000				
305	702			LXXIV LXXVI LXXVII	'17	+ '30	+ '035		+ '335	72 34 7'625	4'7464496,7	55776'29	10'564
					'16	+ '23	- '004		+ '226	52 46 10'146	4'6678925,6	46547'09	8'816
		'17	+ '12		- '031		+ '089	54 39 42'229	4'6784239,7	47689'63	9'032		
		'50				+ '650	180 0 0'000						
306	702	LXXVII LXXVI LXXIX	'40	+ '07	+ '048		+ '118	76 58 9'488	4'9830763,3	96178'14	18'216		
			'39	+ '04	+ '014		+ '054	68 37 43'874	4'9634675,8	91932'19	17'411		
			'39	- '10	- '062		- '162	34 24 6'638	4'7464496,7	55776'29	10'564		
					'18				+ '010	180 0 0'000			
307	703	LXXVI LXXIX LXXX	'44	+ '46	+ '039		+ '499	49 57 41'939	4'8755377,4	75082'33	14'220		
			'44	+ '13	- '002		+ '128	51 18 18'868	4'8838938,3	76540'95	14'496		
			'45	+ '15	- '037		+ '113	78 43 59'193	4'9830763,3	96178'14	18'216		
				'33				+ '740	180 0 0'000				
		703	LXXV LXXVI LXXVIII	'34	- '43		+ '096	- '334	46 47 48'096	4'8242046,9	66712'11	12'635	
				'34	- '33		- '006	- '336	88 14 50'634	4'9613162,0	91477'90	17'325	
'34	- '01				- '090	- '100	44 57 21'270	4'8106699,7	64665'10	12'247			
		'02				- '770	180 0 0'000						
704	LXXVI LXXVIII LXXX	'25	- '38		+ '006	- '374	39 13 53'076	4'6899704,4	48974'55	9'275			
		'26	- '05		+ '033	- '017	81 16 52'963	4'8838938,3	76540'95	14'496			
		'25	- '03		- '039	- '069	59 29 13'961	4'8242046,9	66712'11	12'635			
				'76				- '460	180 0 0'000				
308	704	LXXX LXXXIX LXXXI	'52	- '67	+ '049		- '621	64 27 8'049	4'9698144,7	93285'57	17'668		
			'52	- '41	+ '031		- '379	68 58 53'241	4'9845969,1	96515'47	18'279		
			'51	- '01	- '080		- '1090	46 33 58'710	4'8755377,4	75082'33	14'220		
				'55				- 2'090	180 0 0'000				
309	704	LXXXIX LXXXI LXXXII	'52	+ '30	+ '085		+ '385	47 1 1'355	4'8794929,4	75769'24	14'350		
			'52	+ 1'08	- '037		+ 1'043	68 44 8'403	4'9846223,5	96521'12	18'281		
			'52	+ '69	- '048		+ '642	64 14 50'242	4'9698144,7	93285'57	17'668		
				'56				+ 2'070	180 0 0'000				
310	704	LXXXII LXXXI LXXXV	'38	- '25	+ '050		- '200	72 16 27'770	4'9245048,0	84043'63	15'917		
			'37	- 1'35	- '014		- 1'364	48 32 58'386	4'8204163,7	66132'72	12'525		
			'38	- '45	- '036		- '486	59 10 33'844	4'8794929,4	75769'24	14'350		
				'13				- 2'050	180 0 0'000				
311	704	LXXXI LXXXV LXXXVI	'35	+ '52	+ '070		+ '590	43 33 44'890	4'7815071,2	60465'43	11'452		
			'36	+ '45	- '002		+ '448	63 7 38'218	4'8935676,0	78265'00	14'823		
			'36	+ '98	- '068		+ '912	73 18 36'892	4'9245048,0	84043'63	15'917		
				'07				+ 1'950	180 0 0'000				

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
312	705	LXXX	.41	+ .37		+ .049	+ .419	53 59 29.079	4.8953996,7	78595.87	14.886
		LXXXI	.40	+ .90		+ .004	+ .904	42 36 50.124	4.8181132,2	65782.93	12.459
		LXXXIII	.41	+ .46		-.053	+ .407	83 23 40.797	4.9845969,1	96515.47	18.279
				1.22			+ 1.730	180 0 0.000			
	706	LXXXI	.42	- .14		+ .022	- .118	65 32 40.322	4.9165943,6	82526.67	15.630
		LXXXIII	.41	- .08		+ .067	- .013	54 21 7.677	4.8673021,9	73671.95	13.953
		LXXXIV	.42	+ .05		-.089	- .039	60 6 12.001	4.8953996,7	78595.87	14.886
				1.25			- .170	180 0 0.000			
	707	LXXXI	.31	- .10		+ .035	- .065	44 25 36.285	4.7604072,8	57597.98	10.909
		LXXXIV	.32	- .15		+ .031	- .119	72 1 13.221	4.8935676,0	78265.00	14.823
		LXXXVI	.32	- .04		-.066	- .106	63 33 10.494	4.8073021,9	73671.95	13.953
				.95			- .290	180 0 0.000			
313	LXXXVI LXXXV LXXXVII	.24	- .42	+ .045		- .375	60 42 31.295	4.7753463,3	59613.73	11.290	
		.24	- .16	+ .022		- .138	57 5 18.672	4.7587847,5	57383.20	10.868	
		.24	+ .01	-.067		- .057	62 12 10.033	4.7815071,2	60465.43	11.452	
			.72			- .570	180 0 0.000				
313	LXXXV LXXXVII LXXXVIII	.22	- .28	+ .070		- .210	60 31 21.760	4.7606971,8	57636.44	10.916	
		.22	- .36	-.030		- .390	55 15 52.080	4.7356643,8	54408.20	10.305	
		.23	- .76	-.040		- .800	64 12 46.160	4.7753463,3	59613.73	11.290	
			.67			- 1.400	180 0 0.000				
314	LXXXVIII LXXXVII XC	.20	- .05	+ .070		+ .020	60 7 20.410	4.7410828,7	55091.28	10.434	
		.20	+ .09	-.031		+ .059	54 45 47.789	4.7151207,6	51894.44	9.828	
		.21	- .06	-.039		- .099	65 6 51.801	4.7606971,8	57636.44	10.916	
			.61			- .020	180 0 0.000				
315	LXXXVII XC XCI	.22	- .14	+ .041		- .099	68 14 1.181	4.7899532,8	61652.87	11.677	
		.22	- .41	+ .037		- .373	55 40 53.727	4.7390125,6	54829.29	10.384	
		.22	- .27	-.078		- .348	56 5 5.092	4.7410828,7	55091.28	10.434	
			.66			- .820	180 0 0.000				
708	LXXXVI LXXXVII LXXXIX	.19	- .28		+ .067	- .213	58 3 12.467	4.7195094,7	52421.50	9.928	
		.19	- .02		+ .035	+ .015	53 41 21.295	4.6970726,0	49782.03	9.428	
		.19	- .23		-.102	- .332	68 15 26.238	4.7587847,5	57383.20	10.868	
			.57			- .530	180 0 0.000				
709	LXXXVII LXXXIX XCI	.21	+ .12		+ .052	+ .172	65 50 46.342	4.7658712,2	58327.22	11.047	
		.21	+ .01		+ .081	+ .091	59 3 45.521	4.7390125,6	54829.29	10.384	
		.20	- .01		-.133	- .143	55 5 28.137	4.7195094,7	52421.50	9.928	
			.62			+ .120	180 0 0.000				
316	XCI XC XCII	.26	- .61	+ .086		- .524	58 31 29.856	4.7847172,7	60914.02	11.537	
		.26	- .09	+ .041		- .049	61 47 44.961	4.7989440,2	62942.51	11.921	
		.26	+ .04	-.127		- .087	59 40 45.183	4.7899532,8	61652.87	11.677	
			.78			- .660	180 0 0.000				
317	XC XCII XCIII	.21	- 1.14	+ .148		- .992	51 15 57.488	4.7123552,7	51565.03	9.766	
		.22	- .28	-.072		- .352	61 35 22.258	4.7644940,5	58142.55	11.012	
		.22	- .51	-.076		- .586	67 8 40.254	4.7847172,7	60914.02	11.537	
			.65			- 1.930	180 0 0.000				
318	XCIII XCII XCV	.23	+ .09	+ .122		+ .212	68 52 3.742	4.7979382,0	62796.90	11.893	
		.22	+ .39	-.020		+ .370	61 8 36.670	4.7705932,1	58964.85	11.168	
		.22	+ .24	-.102		+ .138	49 59 19.588	4.7123552,7	51565.03	9.766	
			.67			+ .720	180 0 0.000				

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles	
319		XCII XCV XCVI	"	"	"	"	"	o' "				
			'25	- '07	+ '106		+ '036	53 12 11'746	4'7548904,0	56870'94	10'771	
			'26	- '45	+ '034		- '416	64'38 34'234	4'8073881,1	64178'29	12'155	
				'25	- '55	- '140		- '690	62 9 14'020	4'7979382,0	62796'90	11'893
				'76				- 1'070	180 0 0'000			
		710	XCI XCII XCIV	'26	- '25		+ '155	- '095	54 10 13'865	4'7672544,6	58513'28	11'082
				'27	- '05		+ '039	- '011	65 7 18'749	4'8160659,3	65473'56	12'400
				'26	- '36		- '194	- '554	60 42 27'386	4'7989440,2	62942'51	11'921
				'79				- '660	180 0 0'000			
		711	XCII XCIV XCVI	'25	+ '06		+ '074	+ '134	59 15 43'924	4'7843314,7	60859'94	11'527
				'26	- '10		+ '122	+ '022	65 0 35'152	4'8073881,1	64178'29	12'155
				'25	- '17		- '196	- '366	55 43 40'924	4'7672544,6	58513'28	11'082
		'76				- '210	180 0 0'000					
320		XCV XCVI XCVII	'22	- '24	+ '128		- '112	62 57 30'728	4'7676247,3	58563'19	11'092	
			'22	- '61	- '050		- '660	57 9 55'960	4'7423078,7	55246'89	10'463	
			'22	- '95	- '078		- 1'028	59 52 33'312	4'7548904,0	56870'94	10'771	
		'66				- 1'800	180 0 0'000					
321		XCVI XCVII XCIX	'18	+ '82	+ '092		+ '912	53 42 23'032	4'6948438,4	49527'21	9'380	
			'18	+ '40	+ '025		+ '425	53 55 16'915	4'6960357,6	49663'32	9'406	
			'19	+ '14	- '117		+ '023	72 22 20'053	4'7676247,3	58563'19	11'092	
		'55				+ 1'360	180 0 0'000					
322		XCIX XCVII CI	'26	+ 1'00	+ '106		+ 1'106	66 42 45'906	4'8383656,2	68923'23	13'054	
			'26	+ '26	+ '100		+ '360	71 59 2'160	4'8534369,1	71357'05	13'515	
			'25	- '18	- '206		- '386	41 18 11'934	4'6948438,4	49527'21	9'380	
		'77				+ 1'080	180 0 0'000					
323		XCVII CI C	'29	- '16	+ '183		+ '023	49 9 49'373	4'7673567,1	58527'06	11'085	
			'30	+ '03	- '083		- '053	67 50 26'007	4'8551768,5	71643'51	13'569	
			'29	- '44	- '100		- '540	62 59 44'620	4'8383656,2	68923'23	13'054	
		'88				- '570	180 0 0'000					
712		XCV XCVII XCVIII	'25	+ '23		+ '302	+ '532	58 46 38'512	4'7789987,9	60117'21	11'386	
			'25	+ '38		- '129	+ '251	69 25 13'771	4'8183134,4	65813'26	12'465	
			'24	+ '70		- '173	+ '527	51 48 7'717	4'7423078,7	55246'89	10'463	
		'74				+ 1'310	180 0 0'000					
713		XCVII XCVIII C	'28	- '06		- '101	- '161	55 38 2'989	4'7946661,5	62325'55	11'804	
			'28	- '09		+ '236	+ '146	71 35 48'686	4'8551768,5	71643'51	13'569	
			'28	+ '56		- '135	+ '425	52 46 8'325	4'7789987,9	60117'21	11'386	
		'84				+ '410	180 0 0'000					
324		C CI CII	'51	- '41	+ '135		- '275	65 38 2'915	5'0433392,0	110494'12	20'927	
			'51	+ '52	+ '022		+ '542	85 31 0'052	5'0825234,9	120927'05	22'903	
			'50	+ '37	- '157		+ '213	28 50 57'033	4'7673567,1	58527'06	11'085	
		1'52				+ '480	180 0 0'000					
325		CI CII CIII	'30	+ 1'11	+ '117		+ 1'227	30 29 6'057	4'7902334,3	61692'65	11'684	
			'31	- '39	- '061		- '451	34 49 48'619	4'8417044,8	69455'16	13'154	
			'31	- '17	- '056		- '226	114 41 5'324	5'0433392,0	110494'12	20'927	
		'92				+ '550	180 0 0'000					

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
326	714	C CI CIII	"	"	"	"	"	o' 1' "	4'8417044,8 5'0361917,0 4'7673567,1	69455'16 108690'53 58527'06	13'154 20'585 11'085
			'29 + '39			- '010	+ '380	35 3 11'350			
		'29 + 1'63			+ '139	+ 1'769	116 0 6'629				
		'28 - '16			- '129	- '289	28 56 42'021				
		'86				+ 1'860	180 0 0'000				
		CIII CII CV	'32 + '69 + '035			+ '725	67 2 38'425				
	'32 + '49 + '035				+ '525	62 34 3'225					
	'31 + '24 - '070				+ '170	50 23 18'350					
	'95				+ 1'420	180 0 0'000					
	327		CII CV CIV	'27 + '01 + '050			+ '060	62 12 19'850			
				'26 + '24 - '034			+ '206	42 56 35'256			
		'27 + '32 - '016				+ '304	74 51 4'894				
'80				+ '570	180 0 0'000						
715		CII CIII CIV	'21 + '50		+ '085	+ '585	124 46 23'455				
			'20 - '04		- '025	- '065	25 4 21'625				
	'21 + '14			- '060	+ '080	30 9 14'920					
	'62			+ '600	180 0 0'000						
	328	CV CIV CVI	'49 + '16 + '059			+ '219	58 33 4'179				
			'49 + '79 + '043			+ '833	82 40 19'073				
'48 + '01 - '102					- '092	38 46 36'748					
1'46				+ '960	180 0 0'000						
329		CIV CVI CVII	'47 + '33 + '096			+ '426	41 20 42'006				
			'48 - '02 - '048			- '068	74 23 1'782				
	'47 + '44 - '048				+ '392	64 16 16'212					
	1'42			+ '750	180 0 0'000						
	330	CVII CVI (XXIII)	'47 - '39 + '052			- '338	91 21 2'912				
			'46 - '39 + '011			- '379	51 23 7'241				
'46 - '17 - '063					- '233	37 15 49'847					
1'39				- '950	180 0 0'000						
331		CVI (XXIII) (XXV)	'69 - '06 + '058			- '002	46 36 4'128				
			'69 + '48 + '011			+ '491	64 35 51'361				
	'69 + '31 - '069				+ '241	68 48 4'511					
	2'07			+ '730	180 0 0'000						
	716	CV CVI CVIII	'41 - '02		+ '088	+ '068	37 2 26'648				
			'42 - '30		- '028	- '328	49 37 42'502				
'42 - '16				- '060	- '220	93 19 50'850					
1'25				- '480	180 0 0'000						
717		CVI CVIII CIX	'40 - '11		+ '050	- '060	66 57 51'800				
			'41 + '34		+ '058	+ '398	68 39 51'648				
	'40 + '24			- '108	+ '132	44 22 16'552					
	1'21			+ '470	180 0 0'000						
	718	CVI CIX (XXV)	'39 - '29		+ '059	- '231	32 15 32'479				
			'39 + '07		+ '010	+ '080	95 15 13'500				
'39 + '07				- '069	+ '001	52 29 14'021					
1'17				- '150	180 0 0'000						

NOTE.—(XXIII) and (XXV) appertain to base-line figures.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance				
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles		
319		XCII XCV XCVI	"	"	"	"	"	o' "					
			'25	- '07	+ '106		+ '036	53 12 11'746	4'7548904,0	56870'94	10'771		
			'26	- '45	+ '034		- '416	64'38 34'234	4'8073881,1	64178'29	12'155		
					'25	- '55	- '140		- '690	62 9 14'020	4'7979382,0	62796'90	11'893
					'76				- 1'070	180 0 0'000			
		710	XCI XCII XCIV	'26	- '25		+ '155	- '095	54 10 13'865	4'7672544,6	58513'28	11'082	
				'27	- '05		+ '039	- '011	65 7 18'749	4'8160659,3	65473'56	12'400	
				'26	- '36		- '194	- '554	60 42 27'386	4'7989440,2	62942'51	11'921	
					'79				- '660	180 0 0'000			
		711	XCII XCIV XCVI	'25	+ '06		+ '074	+ '134	59 15 43'924	4'7843314,7	60859'94	11'527	
				'26	- '10		+ '122	+ '022	65 0 35'152	4'8073881,1	64178'29	12'155	
				'25	- '17		- '196	- '366	55 43 40'924	4'7672544,6	58513'28	11'082	
			'76				- '210	180 0 0'000					
320		XCV XCVI XCVII	'22	- '24	+ '128		- '112	62 57 30'728	4'7676247,3	58563'19	11'092		
			'22	- '61	- '050		- '660	57 9 55'960	4'7423078,7	55246'89	10'463		
			'22	- '95	- '078		- 1'028	59 52 33'312	4'7548904,0	56870'94	10'771		
					'66				- 1'800	180 0 0'000			
321		XCVI XCVII XCIX	'18	+ '82	+ '092		+ '912	53 42 23'032	4'6948438,4	49527'21	9'380		
			'18	+ '40	+ '025		+ '425	53 55 16'915	4'6960357,6	49663'32	9'406		
			'19	+ '14	- '117		+ '023	72 22 20'053	4'7676247,3	58563'19	11'092		
					'55				+ 1'360	180 0 0'000			
322		XCIX XCVII CI	'26	+ 1'00	+ '106		+ 1'106	66 42 45'906	4'8383656,2	68923'23	13'054		
			'26	+ '26	+ '100		+ '360	71 59 2'160	4'8534369,1	71357'05	13'515		
			'25	- '18	- '206		- '386	41 18 11'934	4'6948438,4	49527'21	9'380		
					'77				+ 1'080	180 0 0'000			
323		XCVII CI C	'29	- '16	+ '183		+ '023	49 9 49'373	4'7673567,1	58527'06	11'085		
			'30	+ '03	- '083		- '053	67 50 26'007	4'8551768,5	71643'51	13'569		
			'29	- '44	- '100		- '540	62 59 44'620	4'8383656,2	68923'23	13'054		
					'88				- '570	180 0 0'000			
		712	XCV XCVII XCVIII	'25	+ '23		+ '302	+ '532	58 46 38'512	4'7789987,9	60117'21	11'386	
				'25	+ '38		- '129	+ '251	69 25 13'771	4'8183134,4	65813'26	12'465	
'24	+ '70				- '173	+ '527	51 48 7'717	4'7423078,7	55246'89	10'463			
			'74				+ 1'310	180 0 0'000					
713	XCVII XCVIII C	'28	- '06		- '101	- '161	55 38 2'989	4'7946661,5	62325'55	11'804			
		'28	- '09		+ '236	+ '146	71 35 48'686	4'8551768,5	71643'51	13'569			
		'28	+ '56		- '135	+ '425	52 46 8'325	4'7789987,9	60117'21	11'386			
			'84				+ '410	180 0 0'000					
324		C CI CII	'51	- '41	+ '135		- '275	65 38 2'915	5'0433392,0	110494'12	20'927		
			'51	+ '52	+ '022		+ '542	85 31 0'052	5'0825234,9	120927'05	22'903		
			'50	+ '37	- '157		+ '213	28 50 57'033	4'7673567,1	58527'06	11'085		
					1'52				+ '480	180 0 0'000			
325		CI CII CIII	'30	+ 1'11	+ '117		+ 1'227	30 29 6'057	4'7902334,3	61602'65	11'684		
			'31	- '39	- '061		- '451	34 49 48'619	4'8417044,8	69455'16	13'154		
			'31	- '17	- '056		- '226	114 41 5'324	5'0433392,0	110494'12	20'927		
					'92				+ '550	180 0 0'000			

KARACHI LONGITUDINAL SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance					
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles			
326	714	C CI CIII	"	"	"	"	0' 1' "	4'8417044,8 5'0361917,0 4'7673567,1	69455'16 108690'53 58527'06	13'154 20'585 11'085				
			'29 + '39			- '010 + '380	35 3 11'350							
		'29 + 1'63			+ '139 + 1'769	116 0 6'629								
		'28 - '16			- '129 - '289	28 56 42'021								
		'86			+ 1'860	180 0 0'000								
		715	CIII CII CV	'32 + '69 + '035			+ '725				67 2 38'425	4'8676933,8 4'8517210,5 4'7902334,3	73738'34 71075'68 61692'65	13'966 13'461 11'684
	'32 + '49 + '035					+ '525	62 34 3'225							
	'31 + '24 - '070				+ '170	50 23 18'350								
	'95				+ 1'420	180 0 0'000								
	327		CII CV CIV	'27 + '01 + '050			+ '060	62 12 19'850	4'8298126,8 4'7163736,3 4'8676933,8	67579'14 52044'35 73738'34	12'799 9'857 13'966			
				'26 + '24 - '034			+ '206	42 56 35'256						
		'27 + '32 - '016			+ '304	74 51 4'894								
'80				+ '570	180 0 0'000									
328		CII CIII CIV	'21 + '50		+ '085	+ '585	124 46 23'455	5'0038093,4 4'7163736,3 4'7902334,3				100880'99 52044'35 61692'65	19'106 9'857 11'684	
			'20 - '04		- '025	- '065	25 4 21'625							
	'21 + '14		- '060	+ '080	30 9 14'920									
	'62			+ '600	180 0 0'000									
	329	CV CIV CVI	'49 + '16 + '059			+ '219	58 33 4'179		4'9640409,5 5'0294759,5 4'8298126,8	92053'64 107022'72 67579'14	17'434 20'269 12'799			
			'49 + '79 + '043			+ '833	82 40 19'073							
'48 + '01 - '102				- '092	38 46 36'748									
1'46				+ '960	180 0 0'000									
330		CIV CVI CVII	'47 + '33 + '096			+ '426	41 20 42'006	4'8293172,5 4'9930496,1 4'9640409,5				67502'10 98412'34 92053'64	12'784 18'639 17'434	
			'48 - '02 - '048			- '068	74 23 1'782							
	'47 + '44 - '048			+ '392	64 16 16'212									
	1'42			+ '750	180 0 0'000									
	331	CVII CVI (XXIII)	'47 - '39 + '052		- '338	91 21 2'912	5'0470921,8 4'9400645,7 4'8293172,5		111453'11 87109'31 67502'10	21'109 16'498 12'784				
			'46 - '39 + '011		- '379	51 23 7'241								
'46 - '17 - '063			- '233	37 15 49'847										
1'39				- '950	180 0 0'000									
716		CVI (XXIII) (XXV)	'69 - '06 + '058		- '002	46 36 4'128		4'9388101,8 5'0333620,8 5'0470921,8			86858'08 107984'67 111453'11	16'450 20'452 21'109		
			'69 + '48 + '011		+ '491	64 35 51'361								
	'69 + '31 - '069		+ '241	68 48 4'511										
	2'07			+ '730	180 0 0'000									
	717	CV CVI CVIII	'41 - '02		+ '088	+ '068	37 2 26'648		4'8100827,5 4'9120855,4 5'0294759,5	64577'72 81674'33 107022'72			12'231 15'469 20'269	
			'42 - '30		- '028	- '328	49 37 42'502							
'42 - '16			- '060	- '220	93 19 50'850									
1'25				- '480	180 0 0'000									
718		CVI CIX (XXV)	'40 - '11		+ '050	- '060	66 57 51'800	4'9293276,1 4'9345827,1 4'8100827,5			84982'14 86016'69 64577'72	16'095 16'291 12'231		
			'41 + '34		+ '058	+ '398	68 39 51'648							
	'40 + '24		- '108	+ '132	44 22 16'552									
	1'21			+ '470	180 0 0'000									
	718	CVI CIX (XXV)	'39 - '29		+ '059	- '231	32 15 32'479		4'7625263,6 5'0333620,8 4'9345827,1	57879'71 107984'67 86016'69			10'962 20'452 16'291	
			'39 + '07		+ '010	+ '080	95 15 13'500							
'39 + '07			- '069	+ '001	52 29 14'021									
1'17				- '150	180 0 0'000									

NOTE.—(XXIII) and (XXV) appertain to base-line figures.

## PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

### KARACHI LONGITUDINAL SERIES.

The initial elements of this Series are those of the stations (III) and (IV) and are obtained from the Great Arc Meridional Series page 25—, being as follows:—

	Lat. N.	Long. E. of Gh.	Azimuth
At (III)	24° 14' 20".42	77° 43' 11".09	351° 28' 10".25 of (IV)
„ (IV)	23 59 44.93	77 45 34.03	171 29 8.67 of (III)
	Distance (III) to (IV) in Log. feet = 4.9511023,0		

Fixed Station A				Deduced Station B					
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A	
		° ' "				° ' "	° ' "	° ' "	
29	(III)	40 38 11.30	4.8060766,7	30	I	24 6 19.17	77 35 41.29	220 35 7.11	
„	„	104 16 34.39	4.9344859,9		IV	24 17 49.79	77 28 10.14	284 10 24.09	
2	(IV)	80 52 4.61	5.0089274,6		II	23 57 3.35	77 27 27.46	260 44 43.13	
„	„	125 56 58.87	4.8314429,8	I				305 52 57.30	
30	IV	30 12 3.29	4.9009452,9	31	III	24 6 27.97	77 20 57.88	210 9 6.08	
„	„	73 11 53.64	4.7918257,8		V	24 14 52.08	77 17 29.59	253 7 30.33	
„	„	139 21 52.23	5.0046088,5		VII	24 30 29.18	77 16 17.43	319 16 57.78	
„	„	329 2 45.51	4.9098775,0		I				149 5 50.46
„	I	39 14 31.86	4.8597773,1		II				219 11 10.79
„	„	90 40 18.10	4.9129935,6		III				270 34 17.29
„	II	147 39 34.67	4.8290877,3	III				327 36 56.03	
31	V	37 11 37.66	4.9151694,8	32	VI	24 4 2.62	77 8 33.01	217 7 58.07	
„	„	117 0 50.86	5.0018433,6		VIII	24 22 23.15	77 1 21.84	296 54 12.45	
„	„	175 58 10.89	4.9769035,9		VII				355 57 41.10
„	„	339 13 47.32	4.7357107,5		III				159 15 12.62
„	„								

Note.—(III) and (IV) appertain to base-line figures.



Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
32	III	78 2 32.14	4.8485483,9	33	VI			257 57 28.14
	VIII	68 0 22.56	5.1215489,2		IX	24 14 10.67	76 39 16.38	247 51 17.01
	"	III 15 57.22	5.1092672,0		XI	24 30 3.74	76 39 44.13	291 7 0.37
	"	239 17 17.10	4.9831815,7		VII			59 23 27.65
"	"	340 12 45.13	5.0719977,1	VI			160 15 42.02	
33	VI	61 15 29.91	5.2673728,2	X	23 49 18.04	76 39 25.14	241 3 40.53	
	"	110 46 7.29	5.2402288,4	IX			290 34 8.54	
	XI	1 31 46.07	4.9833200,7	IX			181 31 34.62	
	"	52 12 58.85	5.0916670,7	XIII	24 17 33.06	76 22 9.03	232 5 43.03	
"	"	103 50 54.64	5.0842015,6	34	XIV	24 34 50.10	76 18 27.11	283 42 4.23
34	IX	32 46 15.02	5.1492051,0	XII	23 54 35.44	76 25 33.84	212 40 39.50	
	"	102 11 13.75	4.9877976,9	XIII			282 4 11.57	
	"	359 41 25.99	5.1779794,3	X			179 41 29.57	
	X	112 35 38.72	4.9219084,3	XII			292 30 2.36	
"	XIV	47 13 14.43	4.9181115,8	78	XVI	24 25 32.46	76 7 29.34	227 8 41.62
"	"	348 54 11.95	5.0280188,6	XIII			168 55 43.76	
78	XVI	22 59 17.78	5.0681407,0	XV	24 7 45.23	75 59 16.08	202 55 54.97	
"	"	60 16 11.18	5.1394110,2	XVII	24 14 13.63	75 45 55.89	240 7 18.26	
"	"	112 7 38.07	5.0188557,4	79	XVIII	24 32 1.18	75 50 1.55	292 0 23.89
"	"	300 41 56.57	4.9760744,7	XIII			120 47 59.40	
79	XIII	65 3 9.46	5.1469214,0	XV			244 53 46.42	
	"	352 13 2.41	5.1471640,2	XII			172 14 26.03	
	XII	118 40 45.41	5.2216133,8	XV			298 30 3.19	
	XVIII	11 54 52.09	5.0418681,0	XVII			191 53 10.67	
"	"	38 19 25.47	5.1967309,9	XIX	24 11 37.54	75 32 27.93	218 12 10.83	
"	"	80 14 10.75	5.0660415,9	80	XX	24 28 44.16	75 29 19.42	260 5 35.52
"	"	340 43 50.41	5.1921407,5	XV			160 47 38.89	
80	XV	117 55 49.55	4.9233440,3	XVII			297 50 21.75	
"	XX	49 36 0.22	5.1324806,8	81	XXI	24 14 11.86	75 10 43.06	229 28 19.80
"	"	105 16 47.31	4.8497553,7	XXII	24 31 48.39	75 17 0.22	285 11 40.71	
"	"	313 35 5.17	5.1048809,1	XVII			133 41 56.15	
"	"	350 26 21.97	5.0215104,4	XIX			170 27 39.65	
81	XVII	78 9 0.04	4.8832586,9	XIX			258 3 28.63	
"	XXII	18 7 35.42	5.0499755,3	XXI			198 4 59.71	
"	"	64 45 23.68	4.9765810,1	82	XXIII	24 25 7.27	75 1 32.87	244 38 59.49

## PRINCIPAL TRIANGULATION—LATITUDES, LONGITUDES AND AZIMUTHS.

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
81	XXII	108 22 37.80	5.0950874,1	130	XXVI			288 13 45.10
"	"	324 53 6.27	5.1740945,7		XIX			144 59 28.94
	XIX	97 25 21.52	5.0855898,2		XXI			277 16 26.32
82	XXIII	4 33 49.82	4.9525353,7		XXIV	24 10 21.90	75 0 15.84	184 33 18.12
"	"	55 52 11.22	4.9113452,8		XXV	24 17 33.54	74 49 23.29	235 47 10.34
"	"	157 44 29.72	4.9344920,7	130	XXVI	24 38 15.67	74 55 39.78	337 42 3.14
"	"	322 24 8.12	4.9214691,1		XXI			142 27 54.77
	XXI	68 14 49.77	4.7960898,2		XXIV			248 10 32.62
	XXIV	125 50 34.45	4.8719683,0		XXV			305 46 6.62
130	XXVI	15 31 35.12	5.1143126,0		XXV			195 28 59.20
"	"	55 51 27.48	5.2056239,5		XXVII	24 23 21.01	74 31 42.24	235 41 31.03
"	"	104 44 31.53	5.0635141,4	131	XXVIII	24 43 6.11	74 35 25.66	284 36 4.61
131	XXVIII	9 47 44.45	5.0841685,3		XXVII			189 46 11.61
"	"	89 58 14.24	5.0791110,4	132	XXIX	24 43 3.93	74 13 44.30	269 49 10.08
"	"	148 53 43.96	5.2524693,2		XXXI	25 8 22.17	74 18 40.16	328 46 40.15
"	"	333 22 59.52	5.2379367,0		XXV			153 28 46.96
	XXV	109 43 47.13	5.0178575,0		XXVII			289 36 29.80
132	XXIX	60 19 35.48	5.1383141,5		XXXII	24 31 47.99	73 52 10.41	240 10 36.37
"	"	123 54 49.67	5.1358358,4	133	XXXIII	24 55 38.24	73 53 11.59	303 46 12.16
"	"	190 3 29.01	5.1921624,9		XXXI			10 5 33.71
"	"	320 7 43.72	5.1915425,1		XXVII			140 15 11.65
"	"	356 55 39.88	5.1290445,1		XXX	24 20 52.34	74 15 2.32	176 56 12.27
	XXVII	80 50 14.69	4.9715322,3		XXX			260 43 22.13
	XXX	117 38 44.32	5.1553384,4		XXXII			297 29 16.73
133	XXXIII	2 14 26.53	5.1598054,6		XXXII			182 14 0.94
"	"	56 15 30.83	4.9644508,4	134	XXXIV	24 47 10.58	73 39 20.09	236 9 41.31
"	"	106 4 24.19	4.9128765,2		XXXVI	24 59 21.99	73 38 56.93	285 58 23.56
"	"	241 9 44.80	5.2050256,1		XXXI			61 20 31.62
134	XXXIV	10 15 51.05	5.1083222,6		XXXV	24 26 19.52	73 35 12.62	190 14 7.98
"	"	51 29 45.84	5.0958844,3		XXXVII	24 34 20.39	73 21 42.82	231 22 24.39
"	"	124 46 56.69	5.0798864,9	135	XXXVIII	24 58 28.78	73 21 27.13	304 39 25.27
"	"	178 20 50.42	4.8684116,8		XXXVI			358 20 40.67
"	"	322 36 40.97	5.0686944,6		XXXII			142 42 2.35
	XXXII	70 37 56.13	4.9986361,3		XXXV			250 30 54.31
	XXXV	123 1 51.22	4.9501584,9		XXXVII			302 56 15.33

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
135	XXXVIII	37 31 31.35	4.9459537,3	136	XXXIX	24 46 54.71	73 11 43.48	217 27 25.81
"	"	102 23 21.79	5.1846654,2	"	XLI	25 3 51.50	72 54 21.85	282 11 54.41
"	"	266 45 19.93	4.9855702,5	"	XXXVI			86 52 43.30
"	"	359 25 57.33	5.1649709,6	"	XXXVII			179 26 3.90
136	XXXIX	25 38 22.92	5.1841945,1	"	XL	24 24 9.27	72 59 48.01	205 33 25.17
"	"	69 3 4.34	5.1270933,9	137	XLII	24 38 58.39	72 49 6.91	248 53 37.13
"	"	137 0 40.24	5.1475243,7	"	XLI			316 53 21.29
"	"	323 59 12.68	4.9735392,4	"	XXXVII			144 3 22.91
"	XXXVII	63 8 54.87	5.1342105,9	"	XL			242 59 49.89
137	XLII	47 27 34.79	5.0971226,5	"	XLIII	24 24 59.77	72 32 29.86	227 20 40.79
"	"	112 2 17.42	5.1054600,5	138	XLIV	24 46 50.77	72 27 44.54	291 53 21.25
"	"	190 52 28.75	5.1860577,4	"	XLI			10 54 41.14
"	"	326 33 10.40	5.0314494,3	"	XL			146 37 36.53
"	XL	92 1 19.17	5.1803796,3	"	XLIII			271 50 2.18
138	XLIV	56 7 21.89	4.8392480,3	139	XLV	24 40 29.02	72 17 22.84	236 3 1.82
"	"	102 38 11.45	4.8040638,4	"	XLVII	24 49 8.38	72 16 29.94	282 33 28.49
"	"	234 53 2.57	5.2541461,0	"	XLI			55 4 15.67
"	"	348 43 48.75	5.1300884,6	"	XLIII			168 45 47.52
139	XLV	6 59 8.96	4.9265618,1	"	XLVI	24 26 38.64	72 15 31.69	186 58 22.76
"	"	39 15 20.48	4.8884804,0	"	XLVIII	24 30 35.36	72 8 32.81	219 11 39.91
"	"	100 59 16.18	4.7883329,6	140	XLIX	24 42 24.61	72 6 28.89	280 54 43.01
"	"	174 41 19.31	4.7213967,6	"	XLVII			354 40 57.17
"	"	318 11 24.48	5.0994649,3	"	XLIII			138 17 41.26
"	XLIII	96 6 47.32	4.9759556,9	"	XLVI			275 59 46.22
"	XLVI	121 43 12.01	4.6577812,5	"	XLVIII			301 40 18.47
140	XLIX	61 12 11.37	4.8371805,2	"	LI	24 36 56.19	71 55 36.09	241 7 38.98
"	"	114 10 38.09	4.8039359,2	141	LII	24 46 42.58	71 55 58.57	294 6 14.27
"	"	169 52 21.53	4.8067441,9	"	L	24 52 49.57	72 4 26.52	349 51 30.21
"	"	233 37 17.41	4.8374121,1	"	XLVII			53 41 29.17
"	"	350 55 4.25	4.8603274,8	"	XLVIII			170 55 55.85
"	XLVII	108 34 7.22	4.8467594,0	"	L			288 29 3.20
"	XLVIII	118 14 32.00	4.9103800,0	"	LI			298 9 9.12
141	LII	2 0 25.78	4.7725122,3	"	LI			182 0 16.38
"	"	57 23 24.07	4.7969275,4	142	LIII	24 41 7.79	71 46 26.31	237 19 24.65
"	"	111 37 42.25	4.8013810,2	"	LV	24 50 33.33	71 45 19.73	291 33 14.18

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
141	LII	231 36 3'32	4'7758111,0		L			51 39 36'62
142	LIII	61 9 6'04	4'8676236,3		LVI	24 35 14'92	71 34 46'61	241 4 14'37
"	"	121 58 36'08	4'8080406,9	143	LVII	24 46 44'68	71 36 34'66	301 54 28'54
"	"	173 52 8'46	4'7590265,9		LV			353 51 40'57
"	"	296 34 1'81	4'7537242,9		LI			116 37 51'12
"	"	349 6 54'48	4'7447882,9		LIV	24 32 7'21	71 48 19'95	169 7 41'81
"	LI	54 5 54'96	4'6964774,0		LIV			234 2 53'57
"	LIV	104 12 35'69	4'8889332,9		LVI			284 6 57'61
143	LVII	8 9 2'72	4'8471599,5		LVI			188 8 17'60
"	"	68 34 38'15	4'6922424,2	144	LVIII	24 43 46'31	71 28 17'52	248 31 9'99
"	"	132 58 4'08	4'7202420,4		LX	24 52 39'08	71 29 37'37	312 55 8'86
"	"	244 27 44'41	4'7291535,7		LV			64 31 24'75
144	LVIII	13 23 3'90	4'7332001,6		LIX	24 35 4'88	71 26 1'83	193 22 7'29
"	"	70 18 34'18	4'7382615,5		LXI	24 40 43'31	71 18 58'74	250 14 40'65
"	"	140 16 58'26	4'7743221,6	145	LXII	24 51 19'36	71 21 24'87	320 14 5'22
"	"	187 47 5'00	4'7346350,2		LX			7 47 38'50
"	"	325 10 1'47	4'7984422,6		LVI			145 12 43'81
"	LVI	88 49 53'09	4'6852441,6		LIX			268 46 14'74
"	LIX	131 12 55'10	4'7149324,9		LXI			311 9 58'77
145	LXII	11 51 19'06	4'8169046,0		LXI			191 50 17'85
"	"	72 32 15'27	4'8179695,5		LXIII	24 48 3'43	71 10 4'02	252 27 29'38
"	"	137 32 15'02	4'7808879,7	146	LXV	24 58 40'45	71 14 1'82	317 29 8'37
"	"	259 54 35'10	4'6633350,7		LX			79 58 2'20
"	LXI	94 32 23'18	4'8160424,8		LXIV	24 41 34'19	71 7 11'00	274 27 27'60
"	"	132 3 33'44	4'8218859,2		LXIII			311 59 49'66
146	LXV	18 49 2'31	4'8320418,2		LXIII			198 47 22'23
"	"	75 14 6'95	4'6910205,8	147	LXVII	24 56 36'25	71 5 25'99	255 10 29'27
147	LXVII	23 7 8'11	4'7606922,6		LXVI	24 47 51'07	71 1 20'38	203 5 24'81
"	"	68 2 26'90	4'8685587,7		LXVIII	24 52 2'03	70 53 1'85	247 57 13'53
"	"	106 12 47'72	4'9248321,5	148	LXIX	25 0 28'18	70 50 47'97	286 6 37'00
"	"	333 40 3'75	4'7615541,1		LXIII			153 42 0'69
"	LXIII	22 6 9'81	4'6274055,5		LXIV			202 4 57'38
"	"	88 32 57'01	4'6836137,6		LXVI			268 29 17'38
"	LXIV	139 40 15'19	4'6982549,6		LXVI			319 37 48'43
148	LXIX	44 45 16'55	4'9540225,5		LXX	24 49 54'91	70 39 20'39	224 40 26'84

KARACHI LONGITUDINAL SERIES.

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
148	LXIX	75 12 38.71	4.6931768,1	149	LXXI	24 58 23.16	70 42 9.50	255 8 59.68
"	"	322 39 46.58	4.9826046,3		LXVI			142 44 12.88
"	"	346 26 0.14	4.7206329,0		LXVIII			166 26 56.59
	LXVI	118 54 43.12	4.7196961,6		LXVIII			298 51 13.76
149	LXXI	16 53 24.64	4.7292814,1		LXX			196 52 13.43
"	"	59 39 45.25	4.9973586,1		LXXII	24 50 5.01	70 26 38.20	239 33 13.08
"	"	96 44 48.50	4.9331237,5	150	LXXIII	25 0 2.14	70 26 44.00	276 38 17.56
"	"	302 36 36.83	4.8531793,0		LXVIII			122 41 11.70
	LXXIII	80 25 19.74	4.8849996,2		LXX			260 19 34.53
150	LXXIII	0 30 29.67	4.7801569,6		LXXII			180 30 27.23
"	"	46 41 10.15	5.0155298,3		LXXIV	24 48 17.18	70 13 5.51	226 35 25.50
"	"	74 5 59.32	4.7581911,6	151	LXXV	24 57 26.28	70 16 45.08	254 1 46.40
"	"	311 18 52.85	4.9673728,9		LXX			131 24 11.52
	LXX	90 52 36.04	4.8464283,8		LXXII			270 47 15.93
151	LXXV	20 3 8.61	4.7708428,8		LXXIV			200 1 36.23
"	"	65 7 48.65	4.8106699,7	152	LXXVI	24 52 56.48	70 6 7.90	245 3 20.17
"	"	111 55 37.09	4.9613162,0		LXXVIII	25 3 3.89	70 1 22.18	291 49 6.99
"	"	309 10 11.62	4.8479917,6		LXXII			129 14 21.31
	LXXII	81 46 30.91	4.8788249,6		LXXIV			261 40 49.76
152	LXXVI	67 36 53.50	4.9830763,3		LXXIX	24 46 52.76	69 50 2.84	247 30 8.21
"	"	117 34 35.87	4.8838938,3	153	LXXX	24 58 47.00	69 53 50.48	297 29 25.03
"	"	156 48 29.20	4.8242046,9		LXXVIII			336 46 28.60
"	"	306 12 58.93	4.6784239,7		LXXIV			126 15 54.38
"	"	358 59 9.23	4.7464496,7		LXXVII	24 43 44.01	70 6 18.61	178 59 13.72
	LXXIV	53 41 46.58	4.6678925,6		LXXVII			233 38 56.12
	LXXVII	102 1 3.84	4.9634675,8		LXXIX			281 54 15.24
153	LXXX	16 13 24.67	4.8755377,4		LXXIX			196 11 48.90
"	"	80 40 33.24	4.9845969,1	154	LXXXI	24 56 11.09	69 36 35.65	260 33 16.59
"	"	134 40 2.73	4.8181132,2		LXXXIII	25 6 24.88	69 45 21.44	314 36 27.25
"	"	238 0 10.82	4.6899704,4		LXXVIII			58 3 21.82
154	LXXXI	15 51 24.73	4.8794929,4		LXXXII	24 44 8.98	69 32 51.07	195 49 50.40
"	"	64 24 23.49	4.9245048,0		LXXXV	24 50 10.79	69 22 52.74	244 18 37.19
"	"	107 58 8.73	4.8935676,0	155	LXXXVI	25 0 9.68	69 23 6.31	287 52 27.08
"	"	152 23 45.32	4.8673021,9		LXXXIV	25 6 57.72	69 30 24.20	332 21 8.19
"	"	217 56 26.07	4.8953996,7		LXXXIII			38 0 8.46

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
154	LXXXI	307 7 15.81	4.9698144,7		LXXIX			127 12 55.14
	LXXXIX	80 11 53.27	4.9846223,5		LXXXII			260 4 41.17
	LXXXIII	92 21 16.55	4.9165943,6		LXXXIV			272 14 55.77
	LXXXII	123 33 22.25	4.8204163,7		LXXXV			303 29 11.42
155	LXXXVI	1 11 4.33	4.7815071,2		LXXXV		181 10 58.62	
"	"	61 53 35.87	4.7587847,5	156	LXXXVII	24 55 41.58	69 13 56.39	241 49 43.76
"	"	119 56 48.52	4.6970726,0		LXXXIX	25 4 15.66	69 15 17.12	299 53 29.96
"	"	224 19 16.27	4.7604072,8		LXXXIV			44 22 21.73
156	LXXXVII	54 3 34.32	4.7410828,7		XC	24 50 21.02	69 5 52.13	234 0 10.56
	"	122 17 35.72	4.7390125,6	157	XCI	25 0 31.53	69 5 32.50	302 14 3.02
"	"	198 8 22.27	4.7195094,7			LXXXIX		
"	"	304 1 54.03	4.7753463,3		LXXXV			124 5 39.70
"	"	359 17 46.33	4.7606971,8		LXXXVIII	24 46 10.63	69 14 4.07	179 17 49.56
"	LXXXV	63 34 17.72	4.7356643,8		LXXXVIII			243 30 35.95
"	LXXXVIII	119 10 28.95	4.7151207,6		XC			299 7 2.57
157	XCI	56 50 38.45	4.7989440,2	158	XCII	24 54 50.20	68 56 0.05	236 46 36.87
"	"	111 0 52.57	4.8160659,3			XCIV	25 4 23.72	68 54 27.68
"	"	247 8 34.68	4.7658712,2		LXXXIX			67 12 42.12
"	"	358 19 8.33	4.7899532,8		XC			178 19 16.61
158	XCII	59 11 21.68	4.7979382,0		XCIV	24 49 31.23	68 46 14.56	239 7 15.45
	"	112 23 33.68	4.8073881,1	159	XCVI	24 58 52.01	68 45 15.08	292 19 1.64
"	"	171 39 17.85	4.7672544,6			XCIV		
"	"	296 27 22.31	4.7847172,7		XC			116 31 31.39
"	"	358 2 44.79	4.7123552,7		XCIII	24 46 19.65	68 56 19.13	178 2 52.81
159	XC	65 15 33.69	4.7644940,5		XCIII			245 11 33.28
	XCIII	109 10 48.84	4.7705932,1		XCIV			289 6 35.26
160	XCVI	51 38 12.09	4.7676247,3	160	XCVII	24 52 51.71	68 36 56.38	231 34 41.87
	"	105 20 35.30	4.6960357,6			XCIX	25 1 1.94	68 36 34.36
"	"	236 35 20.46	4.7843314,7		XCIV			56 39 14.23
"	"	354 28 15.91	4.7548904,0		XCIV			174 28 40.96
161	XCIX	64 22 1.65	4.8534369,1	161	XCVIII	24 42 56.21	68 36 46.42	232 40 33.20
	"	357 39 15.48	4.6948438,4			XCVII		
161	CI	78 56 45.57	5.0433392,0		CI	24 55 55.68	68 24 55.36	244 17 6.52
	"				XCVII			177 39 24.77
					CII	24 52 24.51	68 5 17.67	258 48 29.67

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
161	CI	109 25 51.93	4.8417044,8	162	CIII	24 59 44.11	68 13 3.35	289 20 51.43
"	"	285 35 18.70	4.8383656,2		XCVII			105 40 22.35
"	"	353 25 45.01	4.7673567,1		C	24 46 19.67	68 26 8.04	173 26 15.55
	XCVII	0 52 29.42	4.7789987,9		XCVIII			180 52 25.25
	"	56 30 32.69	4.8551768,5		C			236 26 0.46
	XCVIII	109 16 36.28	4.7946661,5		C			289 12 9.07
162	CIII	44 1 57.06	4.7902334,3		CII			223 58 40.74
"	"	69 6 18.88	5.0038093,4		CIV	24 53 46.69	67 55 59.65	248 59 7.12
"	"	111 4 35.80	4.8517210,5	163	CV	25 3 56.83	68 1 1.99	290 59 30.59
"	"	318 17 33.73	5.0361917,0		C			138 23 3.91
	C	107 48 12.13	5.0825234,9		CII			287 39 27.20
163	CV	24 19 24.77	4.8298126,8		CIV			204 17 17.09
"	"	82 52 29.44	5.0294759,5	164	CVI	25 1 44.08	67 41 47.26	262 44 20.56
"	"	119 54 56.50	4.9120855,4		CVIII	25 10 39.79	67 48 11.30	299 49 29.31
"	"	341 22 49.25	4.8676933,8		CII			161 24 37.19
	CII	99 12 17.07	4.7163736,3		CIV			279 8 22.25
164	CVI	15 54 0.05	4.8293172,5		CVII	24 51 0.90	67 38 26.47	195 52 35.39
"	"	67 17 7.76	5.0470921,8		(XXIII)	24 54 36.57	67 23 10.44	247 9 16.30
"	"	113 53 12.57	5.0333620,8	165	(XXV)	25 8 56.17	67 23 52.61	293 45 36.89
"	"	146 8 45.44	4.9345827,1		CIX	25 13 31.47	67 33 5.39	326 5 3.84
"	"	213 6 37.64	4.8100827,5		CVIII			33 9 20.58
"	"	301 30 57.79	4.9640409,5		CIV			121 36 57.53
	CIV	80 16 15.05	4.9930496,1		CVII			260 8 52.07
	CVII	104 31 32.01	4.9400645,7		(XXIII)			284 25 6.61
	CVIII	101 49 12.63	4.9293276,1		CIX			281 42 46.89
165	(XXV)	2 33 42.09	4.9388101,8		(XXIII)			182 33 24.25
"	"	241 16 22.48	4.7625263,6		CIX			61 20 17.73

NOTE.—(XXIII) and (XXV) appertain to base-line figures.

J. B. N. HENNESSEY.

PRINCIPAL TRIANGULATION. DIFFERENCES OF HEIGHT.

KARACHI LONGITUDINAL SERIES.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1849	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
Jan. 4	h m 4 29	(IV)	° ' " D 0 6 38.2	4	+		1.15	5.21	4.06	- 12.3			° ' " 0 1 25.7	- 28.2
Feb. 5	4 32	I	D 0 3 33.9	4	370	670	5.43	5.22	0.21	+ 0.6	35	.052	0 1 25.7	- 28.2
„ 13	3 32	(III)	D 0 8 10.1	4			5.04	5.18	0.14	- 0.5			0 2 49.1	- 52.5
Jan. 29	3 33	I	D 0 2 30.3	4	375	632	1.26	0.89	0.37	+ 1.2	- 5	.008	0 2 49.1	- 52.5
Feb. 14	3 24	(III)	D 0 5 8.4	4			1.43	5.18	3.75	- 9.0			0 1 28.2	+ 36.8
Mar. 5	3 24	IV	D 0 8 5.7	4	375	850	1.25	5.38	4.13	- 9.9	37	.044	0 1 28.2	+ 36.8
Jan. 29	3 51	I	D 0 2 18.3	4			1.88	0.89	0.99	+ 2.5			0 3 45.2	+ 88.7
Mar. 5	3 50	IV	D 0 10 0.2	4	364	803	1.84	5.38	3.54	- 9.0	36	.045	0 3 45.2	+ 88.7
Jan. 6	3 33	(IV)	D 0 6 47.8	4			1.42	5.21	3.79	- 7.7			0 1 0.2	+ 29.8
Feb. 17	3 21	II	D 0 8 40.3	4	370	1009	5.42	5.30	0.12	+ 0.2	44	.044	0 1 0.2	+ 29.8
„ 5	5 23	I	D 0 1 43.9	4			5.41	5.22	0.19	+ 0.5			0 2 44.2	+ 57.6
„ 19	5 13	II	D 0 7 13.4	6	364	715	5.05	5.30	0.25	- 0.7	89	.124	0 2 44.2	+ 57.6

NOTE—(III) and (IV) appertain to base-line figures.



Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1849	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference	Angle in seconds				
Feb. 19	h 3 m 26	II	D o 7 22.8	4	+									
" 22	3 29	III	D o 3 28.6	4	377	667	1.42	5.30	3.88	-11.9	20	.030	o 1 57.4	- 38.4
" 22	5 39	I	D o 3 6.0	2			5.08	5.35	0.27	- 0.7				
" 22	5 39	III	D o 5 52.5	6	364	809	5.13	5.43	0.30	- 0.8	136	.168	o 1 23.2	+ 33.0
" 23	4 17	III	D o 3 40.6	4			1.46	5.43	3.97	-10.3				
Mar. 5	4 13	IV	D o 9 8.0	4	369	787	5.63	5.38	0.25	+ 0.6	14	.018	o 2 49.2	+ 65.3
Feb. 23	3 36	III	D o 0 36.4	4			1.41	5.43	4.02	-15.2				
Mar. 9	3 39	V	D o 7 59.5	6	369	538	1.41	5.44	4.03	-15.3	26	.048	o 3 41.5	+ 57.8
" 5	3 11	IV	D o 5 20.4	4			1.42	5.38	3.96	-13.2				
" 10	3 10	V	D o 4 16.0	4	383	612	1.43	5.44	4.01	-13.4	31	.051	o 0 32.3	- 9.7
Feb. 23	3 22	III	D o 7 13.0	4			1.41	5.43	4.02	-11.8				
Mar. 23	3 19	VI	D o 3 27.4	4	369	697	1.42	5.33	3.91	-11.4	40	.057	o 1 52.6	- 38.5
" 10	3 28	V	D o 10 12.0	4			1.41	5.44	4.03	-10.1				
" 24	3 29	VI	D o 2 6.6	4	382	813	1.41	5.33	3.92	- 9.8	47	.058	o 4 2.6	- 96.7
" 9	3 56	V	D o 7 45.6	4			1.28	5.44	4.16	- 9.0				
" 19	3 59	VII	D o 6 48.1	4	382	937	1.42	5.26	3.84	- 8.4	40	.043	o 0 28.5	- 13.1
" 5	3 39	IV	D o 8 31.2	4			1.29	5.38	4.09	- 8.3				
" 19	3 39	VII	D o 7 6.9	4	383	999	1.44	5.26	3.82	- 7.8	39	.039	o 0 41.9	- 20.5
" 10	3 58	V	D o 12 42.1	4			1.27	5.44	4.17	- 8.6				
" 29	4 2	VIII	D o 2 12.6	4	382	992	1.46	5.25	3.79	- 7.8	57	.057	o 5 14.4	- 153.1
" 19	3 0	VII	D o 12 12.5	4			1.26	5.26	4.00	- 8.6				
" 29	3 5	VIII	D o 2 8.6	6	379	950	1.29	5.25	3.96	- 8.5	53	.056	o 5 1.9	- 140.8
" 24	3 41	VI	D o 10 34.1	4			1.29	5.33	4.04	- 7.1				
" 30	3 42	VIII	D o 7 15.2	4	361	1166	1.42	5.25	3.83	- 6.7	55	.047	o 1 39.3	- 56.8
" 26	4 58	VI	D o 14 36.3	6			1.63	5.33	3.70	- 4.4				
April 10	4 59	IX	D o 10 57.2	4	361	1718	1.30	5.24	3.94	- 4.7	97	.056	o 1 49.7	- 92.5

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet	
1849	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc			
							Signal	Instrument	Difference						
	<i>h m</i>		° ' "		+							° ' "			
Mar.	30	3 52	VIII	D o 10 49'5	4		1'00	5'25	4'25	- 6'6					
April	10	3 54	IX	D o 8 47'9	4	350	1307	1'29	5'24	3'95	- 6'2	71	'054	o 1 0'6	- 38'8
Mar.	26	5 22	VI	D o 16 2'2	4		1'29	5'33	4'04	- 4'5					
April	24	5 22	X	D o 11 13'5	4	361	1829	1'36	5'28	3'92	- 4'4	101	'055	o 2 24'3	- 129'5
"	10	4 11	IX	D o 12 22'4	4		1'23	5'24	4'01	- 5'5					
"	24	4 12	X	D o 10 27'4	4	342	1489	1'05	5'28	4'23	- 5'8	65	'044	o 0 57'7	- 42'1
"	24	3 41	X	D o 5 13'5	4		1'30	5'28	3'98	- 9'8					
"	30	3 43	XII	D o 7 39'2	4	333	825	1'23	5'27	4'04	- 10'0	36	'044	o 1 12'8	+ 29'5
"	10	4 40	IX	D o 10 55'2	4		1'35	5'24	3'89	- 5'7					
"	30	4 35	XII	D o 10 8'3	4	342	1393	1'03	5'27	4'24	- 6'2	71	'051	o 0 23'7	- 16'2
"	30	4 50	XII	D o 15 11'7	4		1'28	5'27	3'99	- 5'9					
May	7	5 6	XIII	D o 6 9'0	4	339	1387	1'38	5'25	3'87	- 5'7	59	'043	o 4 31'3	- 184'6
April	10	5 13	IX	D o 14 38'4	4		1'26	5'24	3'98	- 8'4					
May	7	4 22	XIII	D o 0 9'7	4	342	961	1'04	5'25	4'21	- 8'9	45	'047	o 7 14'6	- 204'9
Dec.	14	4 4	IX	D o 14 30'0	9		0'93	4'86	3'93	- 8'4					
"	14	4 51	XI	E o 0 24'0	24	342	951	1'76	5'25	3'49	+ 7'5	60	'063	o 7 26'6	- 208'3
"	11	6 30	VIII	D o 13 58'8	9		2'75	4'86	2'11	- 3'4					
"	11	6 43	XI	D o 0 51'2	4	350	1271	1'33	5'25	3'92	- 6'3	195	'153	o 6 35'3	- 246'5
"	18	4 24	XIII	D o 8 59'9	4		1'24	5'25	4'01	- 6'7					
"	10	4 23	XI	D o 8 56'1	4	300	1220	1'26	5'25	3'99	- 6'7	79	'065	o 0 1'9	- 1'1
"	24	4 21	XII	D o 12 10'8	8		1'27	5'25	3'98	- 4'9					
"	28	4 33	XV	D o 11 47'6	4	339	1646	1'28	5'25	3'97	- 4'9	109	'066	o 0 11'6	- 9'3
"	20	4 15	XIII	D o 5 41'7	4		1'27	5'25	3'98	- 5'9					
"	27	4 19	XV	D o 14 35'2	4	300	1386	1'28	5'25	3'97	- 5'8	90	'065	o 4 26'8	+ 181'4
"	18	3 47	XIII	D o 7 7'2	4		1'28	5'25	3'97	- 7'7					
"	5	3 46	XIV	D o 8 37'7	4	300	1054	1'27	5'25	3'98	- 7'7	62	'059	o 0 45'3	+ 23'4



## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date			Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet	
1850	Mean of Times of observation							Height in feet				In seconds	Decimals of Contained Arc			
	Signal	Instru- ment						Difference	Angle in seconds							
Jan.	7	4 1	XIX	E o 2 55'2	4	+										
"	18	4 12	XX	D o 18 26'5	4	331	1038	1'29	5'25	3'96	+ 7'8	61	'059	o 10 40'9	+ 326'5	
"	11	4 25	XIX	D o 10 50'9	4			1'27	5'25	3'98	- 6'7					
"	21	4 23	XXI	D o 7 22'3	4	331	1203	1'26	5'25	3'99	- 6'8	62	'052	o 1 44'4	- 61'6	
"	18	4 49	XX	D o 19 56'4	4			1'23	5'25	4'02	- 6'1					
"	21	4 50	XXI	E o o 7'4	4	399	1340	1'27	5'25	3'98	+ 6'1	82	'061	o 10 1'9	- 395'9	
"	5	4 23	XIX	D o 4 42'6	4			1'28	5'25	3'97	- 5'5					
Feb.	16	4 37	XXII	D o 17 6'3	4	331	1475	1'23	5'25	4'02	- 5'6	89	'060	o 6 11'8	+ 269'2	
1849-50																
Nov.	19	2 32	XX	D o 8 33'2	4			1'28	5'25	3'97	- 11'6					
Feb.	15	5 6	XXII	D o 2 26'2	4	399	699	1'26	5'25	3'99	- 11'6	31	'044	o 3 3'5	- 63'0	
Jan.	21	4 2	XXI	E o 1 51'5	4			1'25	5'25	4'00	+ 7'4					
Feb.	15	4 48	XXII	D o 18 34'3	4	317	1108	1'27	5'25	3'98	- 7'3	60	'054	o 10 13'0	+ 333'4	
Jan.	21	3 45	XXI	D o 6 15'5	4			0'53	5'25	4'72	- 11'7					
Feb.	2	3 48	XXIII	D o 6 56'3	4	317	825	1'23	4'50	3'27	- 8'1	27	'033	o 0 22'2	+ 9'0	
"	15	4 59	XXII	D o 19 0'8	4			0'53	5'25	4'72	- 10'3					
"	1	4 39	XXIII	E o 4 40'9	4	387	936	1'28	4'50	3'22	+ 7'0	47	'050	o 11 49'2	- 325'8	
Jan.	21	3 56	XXI	E o 10 29'3	4			1'24	5'25	4'01	+ 13'2					
"	25	3 59	XXIV	D o 20 16'9	4	317	618	1'28	5'25	3'97	- 13'1	28	'045	o 15 23'2	+ 279'9	
Feb.	5	4 14	XXIII	E o 3 52'1	4			1'31	4'50	3'19	+ 7'3					
Jan.	25	4 18	XXIV	D o 17 11'9	4	318	886	0'54	5'25	4'71	- 10'8	52	'059	o 10 30'3	+ 274'0	
"	25	4 7	XXIV	D o 3 25'4	4			1'27	5'25	3'98	- 11'0					
"	28	4 9	XXV	D o 8 13'5	4	375	736	1'28	5'25	3'97	- 11'0	30	'041	o 2 24'1	+ 52'0	
Feb.	2	4 30	XXIII	E o 7 29'9	4			1'27	4'50	3'23	+ 8'2					
Jan.	28	4 27	XXV	D o 19 58'0	4	318	806	0'53	5'25	4'72	- 11'9	39	'048	o 13 42'1	+ 325'0	
Feb.	2	4 50	XXIII	E o 9 58'3	4			*1'96	4'50	6'46	+ 15'5					
"	18	5 2	XXVI	D o 23 12'4	4	318	850	0'58	2'04	1'46	- 3'5	37	'044	o 16 41'4	+ 417'5	

\* This height is to be combined with a negative sign, because the pillar at XXVI had a permanent addition made to it of 3'21 feet by a subsequent observer.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st. Stn. in feet	
1850	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc			
							Signal	Instru-ment	Difference	Angle in seconds					
Feb.	16	h m	o ' "		+							o ' "			
"	20	5 6	XXII	D o 7 23.3	4	387	1230	*1.90	5.25	7.15	-11.8	44	.036	o 2 19.9	+ 84.4
"	11	5 39	XXVI	D o 11 50.6	4			2.45	2.04	0.41	+ 0.7				
"	19	4 47	XXV	D o 7 5.5	4	386	1285	*1.95	5.25	7.20	-11.4	77	.060	o 2 31.3	+ 95.4
"	19	4 41	XXVI	D o 11 57.8	2			1.29	2.04	0.75	- 1.2				
"	11	4 6	XXV	D o 4 16.2	4	386	1029	1.46	5.25	3.79	- 7.5	68	.066	o 3 18.3	+ 100.2
Mar.	4	5 6	XXVII	D o 10 53.1	4			1.28	5.25	3.97	- 7.9				
Feb.	20	4 32	XXVI	D o 11 35.4	4	406	1586	1.27	2.04	0.77	- 1.0	96	.061	o o 2.4	+ 1.9
Mar.	4	5 26	XXVII	D o 11 48.3	4			*1.88	5.25	7.13	- 9.2				
Feb.	12	5 41	XXV	D o 11 23.3	4	386	1709	1.28	5.25	3.97	- 4.7	108	.063	o 1 7.9	+ 56.9
"	23	5 37	XXVIII	D o 13 39.1	4			1.27	5.25	3.98	- 4.7				
"	20	5 53	XXVI	D o 9 34.3	4	406	1144	1.28	2.04	0.76	- 1.4	74	.065	o 1 15.4	- 42.3
"	23	5 22	XXVIII	D o 7 14.9	4			*1.88	5.25	7.13	-12.7				
"	28	5 2	XXVII	D o 10 17.4	4	406	1199	1.27	5.25	3.98	- 6.8	64	.053	o 1 15.6	- 44.5
"	23	4 57	XXVIII	D o 7 46.3	4			1.27	5.25	3.98	- 6.8				
1851															
Jan.	19	3 50	XXVII	D o 8 17.0	4	406	1536	0.83	4.73	3.90	- 5.2	100	.065	o 2 56.3	+ 132.8
"	14	3 51	XXIX	D o 14 9.5	4			1.33	5.25	3.92	- 5.2				
"	13	3 50	XXVIII	D o 3 25.7	4	397	1185	0.83	4.75	3.92	- 6.7	83	.070	o 5 10.7	+ 180.7
"	14	3 51	XXIX	D o 13 47.0	4			1.33	5.25	3.92	- 6.7				
"	21	3 48	XXVII	D o 19 49.2	4	406	925	1.18	4.73	3.55	- 7.8	58	.063	o 12 56.6	- 352.6
"	21	3 49	XXX	E o 6 3.2	4			1.33	5.25	3.92	+ 8.6				
"	14	3 27	XXIX	D o 22 23.5	4	435	1330	1.31	5.25	3.94	- 6.0	79	.059	o 12 32.0	- 490.7
"	21	3 27	XXX	E o 2 40.3	4			1.27	5.25	3.98	+ 6.1				
"	21	3 8	XXX	E o 13 9.5	4	333	1413	1.25	5.25	4.00	+ 5.8	95	.067	o 23 26.5	+ 975.2
"	27	3 9	XXXII	D o 33 43.3	4			1.31	5.25	3.94	- 5.7				
"	14	3 17	XXIX	E o 2 9.2	4	435	1359	1.27	5.25	3.98	+ 6.0	89	.065	o 12 6.1	+ 484.1
"	27	3 21	XXXII	D o 22 3.0	4			1.27	5.25	3.98	- 6.0				

\* These heights are to be combined with negative signs, because the pillar at XXVI had a permanent addition made to it of 3.21 feet by a subsequent observer.

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Sta.—1st Sta. in feet
1851	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
	<i>h m</i>		<i>o ' "</i>		<i>+</i>							<i>o ' "</i>		
Jan.	16	3 12	XXIX	D o 7 24.4	4		1.27	5.25	3.98	- 5.3				
"	10	3 13	XXXI	D o 15 3.9	4	435	1538	1.29	5.25	3.96	- 5.2	100	.065	o 3 49.8 + 173.4
"	11	3 51	XXVIII	D o 6 5.4	4			0.83	4.75	3.92	- 4.5			
"	11	3 49	XXXI	D o 19 35.6	4	397	1767	1.33	5.25	3.92	- 4.5	118	.067	o 6 45.1 + 351.3
"	16	3 41	XXIX	D o 2 49.7	4			1.27	5.25	3.98	- 6.0			
"	3	3 41	XXXIII	D o 16 56.9	4	435	1351	1.28	5.25	3.97	- 6.0	88	.065	o 7 3.6 + 280.8
"	10	3 33	XXXI	D o 9 13.8	4			1.29	5.25	3.96	- 5.1			
"	3	3 33	XXXIII	D o 13 50.1	4	471	1584	1.38	5.25	3.87	- 5.0	105	.066	o 2 18.2 + 107.5
"	27	3 38	XXXII	D o 15 21.5	4			1.27	5.25	3.98	- 5.7			
"	4	3 30	XXXIII	D o 5 37.3	4	535	1427	1.27	5.25	3.98	- 5.7	90	.063	o 4 52.1 - 204.6
1850-51														
"	27	3 37	XXXII	E o 20 52.1	4			1.29	5.25	3.96	+ 7.0			
Dec.	23	3 33	XXXIV	D o 37 56.8	4	535	1157	1.28	5.25	3.97	- 7.0	73	.063	o 29 24.5 + 1002.2
Jan.	3	3 23	XXXIII	E o 38 21.2	4			1.29	5.25	3.96	+ 8.9			
Dec.	24	4 1	XXXIV	D o 51 52.6	4	493	910	1.27	5.25	3.98	- 8.9	58	.064	o 45 6.9 + 1209.4
Jan.	28	3 5	XXXII	E o 22 15.6	4			1.29	5.25	3.96	+ 8.2			
"	31	3 3	XXXV	D o 36 53.9	4	535	985	1.31	5.25	3.94	- 8.2	62	.063	o 29 34.8 + 857.8
Dec.	24	3 46	XXXIV	D o 13 19.6	4			1.27	5.25	3.98	- 6.4			
Jan.	31	3 31	XXXV	D o 5 37.2	4	744	1268	1.27	5.25	3.98	- 6.4	72	.057	o 3 51.2 - 143.9
"	31	3 12	XXXV	E o 8 34.8	4			1.26	5.25	3.99	+ 9.2			
Feb.	3	3 13	XXXVII	D o 21 46.9	4	714	881	1.27	5.25	3.98	- 9.2	54	.061	o 15 10.9 + 393.8
Dec.	25	3 5	XXXIV	D o 2 17.2	4			1.27	5.25	3.98	- 6.6			
Feb.	3	3 4	XXXVII	D o 15 55.7	4	744	1232	1.29	5.25	3.96	- 6.5	76	.062	o 6 49.3 + 247.5
Dec.	25	3 18	XXXIV	E o 8 19.2	4			1.27	5.25	3.98	+ 11.1			
"	28	3 16	XXXVI	D o 19 28.8	4	744	730	1.29	5.25	3.96	- 11.0	41	.056	o 13 54.1 + 298.7
Jan.	4	3 24	XXXIII	E o 57 13.2	4			1.27	5.25	3.98	+ 10.0			
Dec.	28	3 7	XXXVI	D i 9 25.0	4	493	808	1.27	5.25	3.98	- 10.0	48	.059	1 3 19.1 + 1507.5

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Str. - 1st Str. in feet.
1850-51	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
Dec. 23	3 53	XXXIV	D 0 7 57.7	4	+									
" 10	3 51	XXXVIII	D 0 9 45.6	4	744	1187	1.29	5.25	3.96	- 6.8	69	.058	0 0 54.0	+ 31.5
" 28	3 37	XXXVI	D 0 16 45.5	4			1.29	5.25	3.96	- 8.4				
" 10	3 39	XXXVIII	E 0 2 20.5	4	806	956	1.33	5.25	3.92	+ 8.4	54	.056	0 9 33.0	- 268.8
Feb. 3	3 37	XXXVII	D 0 15 54.5	4			1.27	5.25	3.98	- 5.6				
Dec. 11	3 43	XXXVIII	D 0 5 35.8	4	796	1444	1.26	5.25	3.99	- 5.6	82	.057	0 5 9.4	- 219.4
Feb. 7	3 20	XXXVII	D 0 15 15.7	4			1.29	5.25	3.96	- 8.7				
" 19	3 22	XXXIX	E 0 1 16.7	4	796	930	1.31	5.25	3.94	+ 8.6	54	.058	0 8 16.2	- 226.4
Dec. 10	4 16	XXXVIII	D 0 6 49.7	4			1.29	5.25	3.96	- 9.2				
Feb. 19	4 15	XXXIX	D 0 6 12.0	4	750	872	1.27	5.25	3.98	- 9.3	54	.062	0 0 18.9	- 8.1
" 3	3 25	XXXVII	D 0 28 43.8	4			1.28	5.25	3.97	- 6.0				
" 14	3 23	XL	E 0 9 0.2	4	796	1346	1.31	5.25	3.94	+ 6.0	87	.065	0 18 52.0	- 747.7
" 19	3 54	XXXIX	D 0 22 52.0	4			1.27	5.25	3.98	- 5.4				
" 14	3 32	XL	E 0 0 34.2	4	749	1510	1.28	5.25	3.97	+ 5.4	92	.061	0 11 43.1	- 521.0
" 14	4 3	XL	E 1 14 13.5	4			1.28	5.25	3.97	+ 7.6				
Nov. 13	3 50	XLII	D 1 30 2.1	4	641	1063	1.27	5.25	3.98	- 7.6	65	.061	1 22 7.8	+ 2569.6
Feb. 20	3 3	XXXIX	E 0 42 55.0	4			1.28	5.25	3.97	+ 6.1				
Nov. 12	2 55	XLII	D 1 2 18.2	4	749	1324	1.27	5.25	3.98	- 6.1	87	.066	0 52 36.6	+ 2051.3
Feb. 20	3 27	XXXIX	D 0 46 47.8	4			1.26	5.25	3.99	- 5.9				
Nov. 27	3 30	XLI	E 0 26 35.9	4	749	1388	1.27	5.25	3.98	+ 5.8	94	.068	0 36 41.8	- 1499.5
Dec. 10	4 4	XXXVIII	D 0 44 46.3	4			1.27	5.25	3.98	- 5.4				
Nov. 28	3 56	XLI	E 0 22 57.2	4	750	1511	1.27	5.25	3.98	+ 5.4	106	.070	0 33 51.8	- 1507.2
" 13	4 8	XLII	D 1 30 43.8	4			1.33	5.25	3.92	- 5.3				
" 26	4 8	XLI	E 1 8 31.1	4	1175	1516	3.25	5.25	2.00	+ 2.7	96	.063	1 19 36.2	- 3555.3
Feb. 14	3 42	XL	E 0 0 18.3	4			1.71	5.25	3.54	+ 4.8				
Mar. 1	3 41	XLIII	D 0 22 10.4	4	641	1497	1.31	5.25	3.94	- 5.4	98	.065	0 11 14.1	+ 495.1

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1850-51	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Nov. 15	h 3 m 12	XLII	D 1 6 10.1	4	+		1.28	5.25	3.97	- 6.5				
Feb. 28	3 14	XLIII	E 0 47 53.3	4	1175	1236	1.28	5.25	3.97	+ 6.5	76	.061	0 57 1.7	-2075.3
Nov. 12	3 14	XLII	D 1 13 57.6	4			1.28	5.25	3.97	- 6.4				
Mar. 7	3 31	XLIV	E 0 55 21.3	4	1175	1260	2.57	5.25	2.68	+ 4.3	77	.061	1 4 38.4	-2398.0
Nov. 27	3 41	XLI	E 0 8 58.2	4			1.27	5.25	3.98	+ 4.6				
Mar. 7	3 39	XLIV	D 0 35 4.5	4	436	1774	1.25	5.25	4.00	- 4.6	108	.061	0 22 1.4	+1150.2
Feb. 28	3 42	XLIII	D 0 18 6.7	4			1.28	5.25	3.97	- 6.0				
Mar. 7	3 45	XLIV	D 0 1 37.5	4	744	1333	1.93	5.25	3.32	- 5.1	80	.060	0 8 14.2	- 323.3
Feb. 28	3 30	XLIII	D 0 57 27.9	4			1.33	5.25	3.92	- 6.4				
Mar. 13	3 33	XLV	E 0 39 2.7	4	744	1242	1.81	5.25	3.44	+ 5.6	74	.060	0 48 14.9	-1765.0
"	7 3 53	XLIV	D 1 16 57.9	4			1.38	5.25	3.87	-11.6				
"	13 3 49	XLV	E 1 6 37.5	4	676	682	1.26	5.25	3.99	+11.9	43	.063	1 11 47.9	-1442.8
"	1 2 53	XLIII	D 1 52 26.9	4			1.25	5.25	4.00	- 8.7				
"	17 2 54	XLVI	E 1 38 27.8	4	744	935	1.70	5.25	3.55	+ 7.7	56	.060	1 45 26.9	-2903.4
"	13 3 25	XLV	D 0 52 33.6	4			1.22	5.25	4.03	- 9.8				
"	17 3 24	XLVI	E 0 39 55.9	4	376	834	1.27	5.25	3.98	+ 9.7	48	.058	0 46 14.7	-1136.0
"	17 4 1	XLVI	D 0 7 34.6	4			1.58	5.25	3.67	-16.6				
"	19 4 6	XLVIII	D 0 0 23.4	4	140	449	1.29	5.25	3.96	-18.0	3	.007	0 3 36.3	- 47.7
"	18 3 17	XLV	D 0 58 22.0	4			1.30	5.25	3.95	-10.5				
"	20 3 20	XLVIII	E 0 46 48.3	4	376	764	1.27	5.25	3.98	+10.6	46	.060	0 52 35.2	-1183.4
"	19 3 29	XLVIII	D 0 4 29.9	4			1.30	5.25	3.95	-11.2				
"	23 3 31	XLIX	D 0 6 52.6	4	130	716	1.29	5.25	3.96	-11.3	28	.039	0 1 11.3	+ 25.1
"	13 3 0	XLV	D 1 9 22.9	4			1.30	5.25	3.95	-13.3				
"	22 3 6	XLIX	E 1 0 9.5	4	376	607	1.43	5.25	3.82	+12.8	40	.066	1 4 46.0	-1157.4
"	13 3 41	XLV	D 0 26 58.4	4			1.27	5.25	3.98	-15.6				
"	10 3 36	XLVII	E 0 18 47.9	4	376	520	1.27	5.25	3.98	+15.6	30	.058	0 22 53.2	- 350.5



Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1851	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference	Angle in seconds				
Mar. 7	h 3 m 22	XLIV	D 1 41 34.7	4	+							0 ' ' "		
" 10	3 12	XLVII	E 1 31 52.6	4	676	629	1.27	5.25	3.98	-12.9	36	.057	1 36 43.7	-1792.7
" 22	3 23	XLIX	E 0 35 4.6	4			1.27	5.25	3.98	+11.9				
" 10	3 22	XLVII	D 0 45 33.7	4	136	679	1.30	5.25	3.95	-11.8	37	.054	0 40 19.2	+ 806.7
April 9	4 23	XLVIII	D 0 17 41.3	4			6.78	5.25	1.53	+ 3.9	- 2	.002	0 11 1.4	- 260.9
" 6	4 14	LI	E 0 4 7.5	4	130	804	1.31	5.25	3.94	+10.0				
Mar. 22	3 50	XLIX	D 0 20 1.6	4			1.27	5.25	3.98	-11.9	24	.035	0 14 33.7	- 291.1
April 6	3 57	LI	E 0 9 5.8	4	136	679	1.30	5.25	3.95	+11.9				
Mar. 23	4 7	XLIX	D 0 16 8.9	4			1.28	5.25	3.97	-12.8	- 6	.009	0 10 34.1	- 197.0
" 25	4 7	L	E 0 4 59.3	4	136	633	1.30	5.25	3.95	+12.7				
" 10	3 6	XLVII	D 0 54 19.8	4			1.28	5.25	3.97	-11.7	40	.058	0 49 1.4	-1002.1
" 25	3 11	L	E 0 43 43.0	4	304	694	1.28	5.25	3.97	+11.7				
" 23	3 49	XLIX	D 0 22 57.0	4			1.27	5.25	3.98	-12.9	17	.027	0 17 46.6	- 329.3
" 28	3 49	LII	E 0 12 36.3	4	136	629	1.30	5.25	3.95	+12.8				
" 25	3 44	L	D 0 12 51.8	4			1.27	5.25	3.98	-13.8	- 3	.005	0 7 40.4	- 133.2
" 28	3 42	LII	E 0 2 29.1	4	95	590	1.28	5.25	3.97	+13.7				
Nov. 11	4 12	LI	D 0 6 17.1	4			6.85	5.25	1.60	+ 5.6	49	.084	0 2 18.7	- 39.8
" 12	4 10	LII	D 0 1 58.3	4	75	585	0.96	4.70	3.74	-13.0				
" 11	3 29	LI	D 0 13 7.4	4			1.24	5.25	4.01	-14.6	9	.016	0 8 21.9	- 138.0
" 15	3 32	LIII	E 0 3 36.3	4	75	560	1.24	5.25	4.01	+14.6				
" 12	3 41	LII	D 0 10 47.0	4			1.24	4.70	3.46	-11.4	14	.023	0 5 39.8	- 103.2
" 14	3 44	LIII	E 0 0 30.7	4	67	619	1.24	5.25	4.01	+13.2				
" 11	3 37	LI	D 0 9 13.7	4			1.24	5.25	4.01	-16.6	4	.008	0 4 55.5	- 71.2
" 12	3 36	LIV	E 0 0 37.3	4	75	491	1.24	5.25	4.01	+16.6				
" 15	3 24	LIII	D 0 0 42.5	4			1.24	5.25	4.01	-14.9	- 1	.002	0 4 8.3	+ 66.9
" 12	3 24	LIV	D 0 8 59.1	4	46	549	1.24	5.25	4.01	-14.9				

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet	
1851	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc			
							Signal	Instrument	Difference						
Nov.	12	h 3 m 43	LIV	D ° 12 14.6	4	+									
"	27	3 42	LVI	D ° 0 40.5	4	60	765	1.24	5.25	4.01	-10.7	6	.008	0 5 47.1	- 130.0
"	26	4 43	LIII	D ° 7 37.6	4			0.50	4.79	4.29	-12.0				
"	26	4 43	LVI	D ° 1 54.3	4	46	728	1.17	5.25	4.08	-11.4	90	.124	0 2 51.4	- 61.3
"	14	2 48	LIII	D ° 8 25.0	4			1.24	5.25	4.01	-14.4				
"	18	2 54	LV	D ° 1 14.3	4	46	567	1.24	5.25	4.01	-14.4	8	.014	0 3 35.4	- 60.0
"	12	3 8	LII	D ° 13 48.7	4			1.24	4.70	3.46	-11.3				
"	18	3 8	LV	E ° 3 49.8	4	67	625	1.24	5.25	4.01	+13.1	25	.040	0 8 50.2	- 162.7
"	15	3 7	LIII	D ° 10 5.2	4			1.24	5.25	4.01	-12.9				
"	22	3 12	LVII	D ° 0 50.2	4	46	635	1.24	5.25	4.01	-12.9	3	.005	0 4 37.5	- 86.5
"	18	3 23	LV	D ° 6 26.1	4			1.24	5.25	4.01	-15.4				
"	22	3 22	LVII	D ° 2 47.5	4	33	530	1.24	5.25	4.01	-15.4	4	.008	0 1 49.3	- 28.4
"	26	3 42	LVI	D ° 7 18.8	4			1.24	5.25	4.01	-11.8				
"	23	3 46	LVII	D ° 4 17.7	4	34	695	1.24	5.25	4.01	-11.8	11	.016	0 1 30.6	- 30.9
"	26	3 26	LVI	D ° 9 25.0	4			1.24	5.25	4.01	-13.2				
"	29	3 32	LVIII	D ° 1 47.1	4	34	621	1.24	5.25	4.01	-13.2	-12	.019	0 3 49.0	- 69.8
"	22	3 33	LVII	D ° 7 2.5	4			1.24	5.25	4.01	-16.8				
"	29	3 40	LVIII	D ° 1 21.5	4	27	486	1.24	5.25	4.01	-16.8	8	.016	0 2 50.5	- 40.7
"	26	3 16	LVI	D ° 6 8.7	4			1.24	5.25	4.01	-17.1				
"	28	3 15	LIX	D ° 2 15.9	4	34	479	1.24	5.25	4.01	-17.1	4	.008	0 1 56.4	- 27.3
"	30	3 30	LVIII	D ° 1 51.5	4			1.24	5.25	4.01	-15.3				
"	28	3 32	LIX	D ° 7 2.5	4	19	535	1.24	5.25	4.01	-15.3	16	.030	0 2 35.5	+ 40.8
"	28	3 23	LIX	D ° 9 46.2	4			1.24	5.25	4.01	-15.9				
Dec.	7	3 26	LXI	E ° 0 46.0	4	28	512	1.24	5.25	4.01	+15.9	2	.004	0 5 16.1	- 79.5
Nov.	30	3 54	LVIII	D ° 6 57.1	4			1.24	5.25	4.01	-15.1				
Dec.	7	3 49	LXI	D ° 2 24.3	4	19	541	1.24	5.25	4.01	-15.1	5	.009	0 2 16.4	- 36.2

KARACHI LONGITUDINAL SERIES.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Str. - 1st Str. in feet
1851	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Dec.	1	h 3 m 29	LVIII	E o 1 10'1	4									
"	2	3 27	LX	D o 9 56'6	4	19	536	1'24	5'25	4'01	+15'2	20	'037	o 5 33'4 + 87'7
Nov.	22	3 44	LVII	D o 1 5'5	4			1'24	5'25	4'01	-15'8			
Dec.	2	3 46	LX	D o 7 20'6	4	27	519	1'24	5'25	4'01	-15'8	22	'042	o 3 7'6 + 47'8
Nov.	30	3 48	LVIII	E o 2 19'1	4			1'24	5'25	4'01	+13'9			
Dec.	4	3 50	LXII	D o 11 29'4	4	19	588	1'24	5'25	4'01	-13'9	33	'056	o 6 54'3 + 119'5
"	2	3 41	LX	D o 1 21'7	4			1'24	5'25	4'01	-18'0			
"	4	3 43	LXII	D o 6 4'8	4	37	455	1'24	5'25	4'01	-18'0	22	'048	o 2 21'6 + 31'6
"	8	3 33	LXI	E o 3 2'2	4			1'24	5'25	4'01	+12'6			
"	4	3 37	LXII	D o 13 19'2	4	12	648	1'24	5'25	4'01	-12'6	28	'043	o 8 10'7 + 156'1
"	7	3 11	LXI	E o 5 55'9	4			1'24	5'25	4'01	+12'5			
"	10	3 12	LXIII	D o 16 11'1	4	12	656	1'24	5'25	4'01	-12'5	33	'050	o 11 3'5 + 213'4
"	6	3 10	LXII	D o 2 3'0	4			1'24	5'25	4'01	-12'6			
"	10	3 5	LXIII	D o 8 2'3	4	44	650	1'24	5'25	4'01	-12'6	35	'054	o 2 59'7 + 57'3
"	7	3 18	LXI	D o 3 3'9	4			1'24	5'25	4'01	-12'6			
"	9	3 22	LXIV	D o 7 38'4	4	12	647	1'24	5'25	4'01	-12'6	15	'023	o 2 17'3 + 43'6
"	10	3 19	LXIII	D o 17 9'8	4			1'24	5'25	4'01	-19'5			
"	9	3 17	LXIV	E o 10 4'8	4	56	419	1'24	5'25	4'01	+19'5	17	'041	o 13 37'3 - 168'0
"	9	3 11	LXIV	E o 14 55'1	4			1'24	5'25	4'01	+16'6			
"	16	3 10	LXVI	D o 22 48'9	4	21	493	1'24	5'25	4'01	-16'6	26	'053	o 18 52'0 + 274'0
"	10	3 39	LXIII	E o 3 43'9	4			1'24	5'25	4'01	+17'1			
"	16	3 39	LXVI	D o 11 14'3	4	56	477	1'24	5'25	4'01	-17'1	30	'063	o 7 29'1 + 105'1
"	10	3 33	LXIII	E o 2 54'4	4			1'24	5'25	4'01	+12'2			
"	11	3 31	LXV	D o 13 13'4	4	56	671	1'24	5'25	4'01	-12'2	38	'057	o 8 3'9 + 159'4
"	4	3 28	LXII	E o 7 41'7	4			1'24	5'25	4'01	+13'7			
"	11	3 38	LXV	D o 16 59'9	4	44	597	1'24	5'25	4'01	-13'7	33	'055	o 12 20'8 + 216'9

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log-distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn in feet	
1851	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc			
							Signal	Instrument	Difference	Angle in seconds					
Dec.	10	<i>h m</i> 3 26	LXIII	E o 6 55.5	4	+									
"	13	3 31	LXVII	D o 15 45.4	4	56	571	1.24	5.25	4.01	+14.3	35	.061	o 11 20.5	+ 190.5
"	11	3 25	LXV	D o 1 39.0	4			1.24	5.25	4.01	-16.8				
"	13	3 25	LXVII	D o 6 6.1	4	89	485	1.24	5.25	4.01	-16.8	27	.056	o 2 13.6	+ 31.8
"	16	3 17	LXVI	E o 0 41.6	4			1.24	5.25	4.01	+14.3				
"	13	3 18	LXVII	D o 9 33.3	4	78	569	1.24	5.25	4.01	-14.3	33	.058	o 5 7.5	+ 85.9
"	16	3 25	LXVI	E o 3 40.5	4			1.24	5.25	4.01	+15.8				
"	17	3 27	LXVIII	D o 11 47.3	4	78	518	1.24	5.25	4.01	-15.8	31	.060	o 7 43.9	+ 118.0
"	13	3 41	LXVII	D o 4 1.7	4			1.24	5.25	4.01	-11.2				
"	17	3 46	LXVIII	D o 7 6.4	4	96	730	1.24	5.25	4.01	-11.2	42	.058	o 1 32.4	+ 33.1
"	16	3 33	LXVI	E o 0 48.7	4			1.24	5.25	4.01	+ 8.6				
"	18	3 33	LXIX	D o 15 2.0	4	78	949	1.24	5.25	4.01	- 8.6	56	.059	o 7 55.4	+ 221.4
"	13	3 49	LXVII	D o 0 44.3	4			1.24	5.25	4.01	- 9.8				
"	18	3 49	LXIX	D o 11 49.2	4	96	831	1.24	5.25	4.01	- 9.8	49	.059	o 5 32.5	+ 135.6
"	17	3 33	LXVIII	E o 2 40.0	4			1.24	5.25	4.01	+15.7				
"	18	3 40	LXIX	D o 10 48.9	4	102	519	1.24	5.25	4.01	-15.7	31	.060	o 6 44.5	+ 103.1
"	17	3 39	LXVIII	D o 4 52.3	4			1.24	5.25	4.01	-10.8				
"	23	3 42	LXX	D o 6 39.1	4	102	758	1.24	5.25	4.01	-10.8	44	.058	o 0 53.4	+ 19.9
"	18	3 25	LXIX	D o 9 51.0	4			1.24	5.25	4.01	- 9.2				
"	23	3 26	LXX	D o 3 32.0	4	124	889	1.24	5.25	4.01	- 9.2	52	.058	o 3 9.5	- 82.7
"	17	3 21	LXVIII	D o 0 45.6	4			1.24	5.25	4.01	-11.6				
"	21	3 27	LXXI	D o 10 1.4	4	102	705	1.24	5.25	4.01	-11.6	41	.058	o 4 37.9	+ 96.1
"	18	3 17	LXIX	D o 4 19.0	4			1.24	5.25	4.01	-16.8				
"	21	3 20	LXXI	D o 3 21.4	4	124	487	1.24	5.25	4.01	-16.8	30	.062	o 0 28.8	- 6.9
"	23	3 37	LXX	E o 0 45.2	4			1.24	5.25	4.01	+15.4				
"	21	3 33	LXXI	D o 8 58.2	4	107	530	1.24	5.25	4.01	-15.4	34	.064	o 4 51.7	+ 75.8

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet		
1851	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc				
							Signal	Instrument	Difference							
Dec.	23	h 3 m 19	LXX	D o 4 57.7	4	+	694	1.24	5.25	4.01	-11.8	42	.061	o o 19.4	+ 6.6	
"	24	3 21	LXXII	D o 5 36.5	4	107	694	1.24	5.25	4.01	-11.8	42	.061	o o 19.4	+ 6.6	
"	20	3 45	LXXI	D o 9 43.6	4	122	982	1.24	5.25	4.01	- 8.3	58	.059	o 2 22.4	- 68.6	
"	24	3 48	LXXII	D o 4 58.8	4	122	982	1.24	5.25	4.01	- 8.3	58	.059	o 2 22.4	- 68.6	
"	23	3 48	LXX	D o 5 56.5	4	107	916	1.24	5.25	4.01	- 8.9	49	.053	o 1 1.0	+ 27.4	
"	25	3 46	LXXIII	D o 7 58.5	4	107	916	1.24	5.25	4.01	- 8.9	49	.053	o 1 1.0	+ 27.4	
"	21	3 39	LXXI	D o 8 26.3	4	122	847	1.24	5.25	4.01	- 9.6	43	.051	o 1 56.6	- 48.5	
"	25	3 38	LXXIII	D o 4 33.2	4	122	847	1.24	5.25	4.01	- 9.6	43	.051	o 1 56.6	- 48.5	
"	24	3 28	LXXII	D o 3 27.1	4	108	596	1.24	5.25	4.01	-13.7	36	.060	o 1 9.0	+ 20.2	
"	25	3 31	LXXIII	D o 5 45.1	4	108	596	1.24	5.25	4.01	-13.7	36	.060	o 1 9.0	+ 20.2	
"	24	3 34	LXXII	D o 7 15.8	4	108	747	1.24	5.25	4.01	-10.9	44	.059	o 1 35.2	- 34.9	
"	30	3 35	LXXIV	D o 4 5.5	4	108	747	1.24	5.25	4.01	-10.9	44	.059	o 1 35.2	- 34.9	
"	26	3 39	LXXIII	D o 9 33.0	4	112	1024	1.24	5.25	4.01	- 8.0	57	.056	o 1 49.6	- 55.1	
"	30	3 40	LXXIV	D o 5 53.8	4	112	1024	1.24	5.25	4.01	- 8.0	57	.056	o 1 49.6	- 55.1	
"	24	3 41	LXXII	D o 5 24.3	4	108	696	1.24	5.25	4.01	-11.7	40	.057	o o 4.4	- 1.5	
"	28	3 50	LXXV	D o 5 15.5	4	108	696	1.24	5.25	4.01	-11.7	40	.057	o o 4.4	- 1.5	
"	25	3 24	LXXIII	D o 5 38.8	4	112	566	1.24	5.25	4.01	-14.4	31	.055	o 1 12.1	- 20.0	
"	29	3 26	LXXV	D o 3 14.7	4	112	566	1.24	5.25	4.01	-14.4	31	.055	o 1 12.1	- 20.0	
"	30	3 29	LXXIV	D o 2 38.4	4	101	583	1.24	5.25	4.01	-14.0	30	.051	o 1 56.8	+ 33.4	
"	28	3 35	LXXV	D o 6 31.9	4	101	583	1.24	5.25	4.01	-14.0	30	.051	o 1 56.8	+ 33.4	
1851-52	Dec.	30	3 54	LXXIV	D o 4 30.4	4	101	471	1.24	5.25	4.01	-17.3	26	.055	o o 43.7	- 10.1
	Jan.	1	3 55	LXXVI	D o 3 3.1	4	101	471	1.24	5.25	4.01	-17.3	26	.055	o o 43.7	- 10.1
	Dec.	29	3 33	LXXV	D o 7 16.1	4	108	639	1.24	5.25	4.01	-12.8	34	.053	o 2 18.3	- 43.3
	Jan.	2	3 35	LXXVI	D o 2 39.6	4	108	639	1.24	5.25	4.01	-12.8	34	.053	o 2 18.3	- 43.3
1851	Dec.	30	3 47	LXXIV	D o 11 23.0	4	101	460	1.24	5.25	4.01	-17.8	23	.050	o 7 38.2	- 103.4
	"	31	3 46	LXXVII	E o 3 53.3	4	101	460	1.24	5.25	4.01	+17.8	23	.050	o 7 38.2	- 103.4

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet
1851-52	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Jan. 1	h 3 m 46	LXXVI	D o 10 3'5	4	+		1'24	5'25	4'01	-14'8				
Dec. 31	3 37	LXXVII	E o 1 20'0	4	99	551	1'24	5'25	4'01	+14'8	29	'053	o 5 41'8	- 92'4
" 31	3 23	LXXVII	D o 3 12'4	4			1'24	5'25	4'01	- 9'0				
Jan. 7	3 24	LXXIX	D o 10 30'1	4	79	908	1'24	5'25	4'01	- 9'0	52	'057	o 3 38'9	+ 97'5
" 1	3 37	LXXVI	D o 7 0'1	4			1'24	5'25	4'01	- 8'6				
" 7	3 40	LXXIX	D o 7 17'8	4	99	950	1'24	5'25	4'01	- 8'6	55	'058	o o 8'9	+ 4'1
" 1	3 9	LXXVI	D o 8 24'7	4			1'24	5'25	4'01	-12'4				
" 3	3 9	LXXVIII	D o 1 36'4	4	99	659	1'24	5'25	4'01	-12'4	41	'062	o 3 24'2	- 66'0
Dec. 29	3 40	LXXV	D o 10 55'8	4			1'24	5'25	4'01	- 9'0				
Jan. 3	3 43	LXXVIII	D o 2 37'5	4	108	904	1'24	5'25	4'01	- 9'0	54	'060	o 4 9'2	- 110'5
1852.														
Jan. 1	3 21	LXXVI	D o 11 20'2	4			1'24	5'25	4'01	-10'8				
" 5	3 22	LXXX	D o o 7'1	4	99	756	1'24	5'25	4'01	-10'8	45	'060	o 5 36'6	- 124'9
" 3	3 54	LXXVIII	D o 8 0'9	4			1'24	5'25	4'01	-16'9				
" 5	3 55	LXXX	E o o 21'7	4	85	484	1'24	5'25	4'01	+16'9	29	'060	o 4 11'3	- 59'7
" 7	3 32	LXXIX	D o 11 37'5	4			1'24	5'25	4'01	-11'0				
" 5	3 32	LXXX	E o o 17'3	4	100	742	1'24	5'25	4'01	+11'0	42	'057	o 5 57'4	- 130'1
" 7	3 57	LXXIX	D o 14 14'0	4			1'24	5'25	4'01	- 8'9				
" 13	3 59	LXXXI	E o o 32'8	4	100	921	1'24	5'25	4'01	+ 8'9	59	'064	o 7 23'4	- 200'5
" 5	3 44	LXXX	D o 9 41'5	4			1'24	5'25	4'01	- 8'6				
" 12	3 44	LXXXI	D o 4 40'6	4	73	954	1'24	5'25	4'01	- 8'6	55	'058	o 2 30'5	- 70'4
" 7	3 48	LXXIX	D o 13 23'6	4			1'24	5'25	4'01	- 8'6				
" 17	3 48	LXXXII	D o o 46'9	4	100	954	1'24	5'25	4'01	- 8'6	60	'063	o 6 18'4	- 177'1
" 14	3 31	LXXXI	D o 4 44'4	4			1'24	5'25	4'01	-10'9				
" 17	3 31	LXXXII	D o 6 44'1	4	58	749	1'24	5'25	4'01	-10'9	41	'055	o o 59'9	+ 22'0
" 17	3 15	LXXXII	D o 18 39'1	4			1'24	5'25	4'01	-12'5				
" 20	3 17	LXXXV	E o 8 18'7	4	63	653	1'24	5'25	4'01	+12'5	29	'044	o 13 28'9	- 259'4

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1853	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Jan. 13	3 21	LXXXI	D o 16 9.5	4	+	830	1.24	5.25	4.01	- 9.8	36	.043	o 9 41.1	- 236.8
" 20	3 26	LXXXV	E o 3 12.7	4	58		1.24	5.25	4.01	+ 9.8				
" 13	3 35	LXXXI	D o 3 28.1	4		776	1.24	5.25	4.01	-10.5	45	.058	o 2 25.3	+ 55.3
" 11	3 35	LXXXIII	D o 8 18.6	4	58		1.24	5.25	4.01	-10.5				
" 5	3 11	LXXX	D o 5 50.1	4		650	1.24	5.25	4.01	-12.6	40	.062	o o 52.5	- 16.7
" 11	3 13	LXXXIII	D o 4 5.2	4	73		1.24	5.25	4.01	-12.6				
" 14	3 17	LXXXI	D o 16 32.2	4		728	1.24	5.25	4.01	-11.2	35	.048	o 10 51.5	- 232.7
" 30	3 15	LXXXIV	E o 5 10.8	4	58		1.24	5.25	4.01	+11.2				
" 11	3 24	LXXXIII	D o 18 10.1	4		815	1.24	5.25	4.01	-10.0	46	.056	o 11 58.5	- 287.5
" 30	3 25	LXXXIV	E o 5 46.9	4	69		1.24	5.25	4.01	+10.0				
" 13	3 46	LXXXI	D o 15 54.7	4		773	1.24	5.25	4.01	-10.6	42	.054	o 9 59.1	- 227.3
" 24	3 45	LXXXVI	E o 4 3.5	4	58		1.24	5.25	4.01	+10.6				
" 31	4 28	LXXXIV	D o 4 20.2	2		569	15.83	5.25	10.58	+37.9	-17	.030	o o 3.7	+ 1.0
" 27	4 28	LXXXVI	D o 4 35.9	2	10		13.50	5.25	8.25	+29.5				
" 23	4 8	LXXXV	D o 4 47.2	4		597	12.50	5.25	7.25	+24.7	-24	.040	o o 10.5	+ 3.1
" 24	4 20	LXXXVI	D o 5 13.0	4	9		11.08	5.25	5.83	+19.9				
" 23	4 29	LXXXV	D o 4 32.6	2		589	1.24	5.25	4.01	-13.9	-26	.044	o 1 1.5	+ 17.8
Feb. 14	4 11	LXXXVII	D o 5 53.3	4	9		13.42	5.25	8.17	+28.3				
Jan. 27	3 50	LXXXVI	D o 4 57.1	4		567	1.24	5.25	4.01	-14.4	-43	.076	o o 43.5	+ 12.1
Feb. 15	3 46	LXXXVII	D o 5 31.7	4	10		15.83	5.25	10.58	+38.0				
Jan. 23	3 45	LXXXV	D o 4 58.3	4		538	14.50	5.25	9.25	+35.1	-64	.119	o o o.8	- 0.2
Feb. 22	3 28	LXXXVIII	D o 5 o.9	4	9		13.42	5.25	8.17	+31.0				
" 14	4 31	LXXXVII	D o 6 2.4	4		569	1.24	5.25	4.01	-14.4	-27	.047	o o 37.0	- 10.3
" 21	4 26	LXXXVIII	D o 4 48.4	4	12		1.24	5.25	4.01	-14.4				
" 21	3 58	LXXXVIII	D o 4 36.2	4		513	9.42	5.25	4.17	+16.6	-60	.117	o o 23.8	+ 6.0
" 19	4 2	XC	D o 5 56.3	4	10		1.24	5.25	4.01	-15.9				

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Sta.—1st Sta. in feet		
1852	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc				
							Signal	Instru-ment	Difference							
Feb.	13	<i>h m</i> 3 58	LXXXVII	D o 5 45'3	4	+										
"	17	3 53	XC	D o 5 39'1	4	12	544	1'24	5'25	4'01	-15'0	-55	.101	o o 3'1	- 0'8	
"	13	4 9	LXXXVII	D o 5 26'6	4			1'24	5'25	4'01	-15'8					
"	1	4 15	LXXXIX	D o 5 31'4	4	12	518	1'24	5'25	4'01	-15'8	-54	.104	o o 2'4	+ 0'6	
Jan.	25	4 2	LXXXVI	D o 4 44'4	4			1'24	5'25	4'01	-16'6					
Feb.	1	3 41	LXXXIX	D o 5 47'1	4	10	492	1'24	5'25	4'01	-16'6	-53	.108	o o 31'4	+ 7'6	
"	13	3 43	LXXXVII	D o 5 30'3	4			1'24	5'25	4'01	-15'1					
"	5	3 42	XCI	D o 5 49'9	4	12	542	1'24	5'25	4'01	-15'1	-54	.100	o o 9'8	+ 2'6	
"	1	4 44	LXXXIX	D o 4 36'7	4			1'24	5'25	4'01	-14'2					
"	6	3 59	XCI	D o 5 21'9	4	11	576	14'08	5'25	8'83	+31'2	-20	.035	o o 45'3	+ 13'3	
"	19	4 11	XC	D o 4 54'2	4			11'33	5'25	6'08	+20'3					
"	10	4 11	XCI	D o 5 18'7	4	12	609	20'00	5'25	14'75	+49'3	-37	.061	o o 26'8	+ 8'0	
Dec.	9	3 48	XC	D o 4 26'9	4			1'24	5'25	4'01	-13'6					
"	16	3 54	XCII	D o 5 41'0	4	12	602	1'24	5'25	4'01	-13'6	11	.018	o o 37'1	+ 10'9	
"	13	3 57	XCI	D o 3 53'5	4			10'92	5'25	5'67	+18'6					
"	15	3 55	XCII	D o 5 0'0	4	13	622	10'50	5'25	5'25	+17'2	26	.042	o o 32'6	+ 9'9	
"	9	3 41	XC	D o 4 36'8	4			1'24	5'25	4'01	-14'2					
"	20	3 46	XCIII	D o 5 22'3	4	12	574	1'24	5'25	4'01	-14'2	2	.003	o o 22'8	+ 6'4	
"	15	3 34	XCII	D o 4 37'2	4			1'24	5'25	4'01	-16'0					
"	20	3 32	XCIII	D o 3 22'3	4	15	509	1'24	5'25	4'01	-16'0	31	.061	o o 37'5	- 9'4	
"	22	3 33	XCIII	D o 3 46'0	4			10'93	5'25	5'68	+19'9					
"	23	3 34	XCIV	D o 5 16'7	4	12	583	11'24	5'25	5'99	+21'0	0	.000	o o 45'9	+ 13'0	
"	16	4 3	XCII	D o 4 44'3	4			1'24	5'25	4'01	-13'2					
"	23	4 1	XCIV	D o 4 16'3	4	15	620	1'24	5'25	4'01	-13'2	53	.085	o o 14'0	- 4'3	
"	16	3 29	XCII	D o 2 57'9	4			9'33	5'25	4'08	+14'4					
"	14	3 27	XCIV	D o 6 11'1	4	15	578	1'24	5'25	4'01	-14'1	14	.024	o 1 22'4	+ 23'4	



Astronomical Date			Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1852-53	Mean of Times of observation							Height in feet				In seconds	Decimals of Contained Arc		
	Signal	Instru-ment						Difference	Angle in seconds						
Dec.	13	h 3 m 42	XCI	D ° 3 7.6	4	+		10.83	5.25	5.58	+17.6				
"	14	3 46	XCIV	D ° 7 2.3	4	13	647	1.24	5.25	4.01	-12.6	16	.025	0 1 42.3	+ 32.5
"	17	3 49	XCV	D ° 4 8.1	4			10.17	5.25	4.92	+15.8				
"	29	3 46	XCVI	D ° 5 6.0	4	15	634	1.24	5.25	4.01	-12.9	39	.061	0 0 14.6	+ 4.5
"	14	3 36	XCIV	D ° 5 36.0	4			1.24	5.25	4.01	-13.6				
"	29	3 38	XCVI	D ° 4 14.4	4	19	601	1.24	5.25	4.01	-13.6	19	.032	0 0 40.8	- 12.0
"	23	3 15	XCV	D ° 4 16.3	4			1.24	5.25	4.01	-14.5				
"	30	3 15	XCVI	D ° 5 35.6	4	14	562	1.24	5.25	4.01	-14.5	0	.000	0 0 39.7	+ 10.9
"	23	3 26	XCV	D ° 3 42.3	4			1.24	5.25	4.01	-15.0				
Jan.	3	3 25	XCVII	D ° 5 32.0	4	14	546	1.24	5.25	4.01	-15.0	11	.020	0 0 54.9	+ 14.7
Dec.	29	3 27	XCVI	D ° 4 46.3	4			1.24	5.25	4.01	-14.1				
Jan.	2	3 30	XCVII	D ° 5 20.4	4	16	579	1.24	5.25	4.01	-14.1	0	.000	0 0 17.1	+ 4.9
Dec.	23	3 42	XCV	D ° 5 5.3	4			1.24	5.25	4.01	-12.6				
Jan.	7	3 43	XCVIII	D ° 5 48.1	4	14	650	1.24	5.25	4.01	-12.6	11	.017	0 0 21.4	+ 6.8
"	2	3 22	XCVII	D ° 5 42.7	4			1.24	5.25	4.01	-13.8				
"	7	3 27	XCVIII	D ° 4 28.8	4	17	594	1.24	5.25	4.01	-13.8	5	.008	0 0 37.0	- 10.8
"	7	3 56	XCVIII	D ° 5 17.1	4			1.24	5.25	4.01	-13.3				
"	8	3 55	C	D ° 5 2.2	4	15	616	1.24	5.25	4.01	-13.3	12	.019	0 0 7.5	- 2.3
"	2	3 52	XCVII	D ° 6 37.6	4			1.24	5.25	4.01	-11.5				
"	9	3 54	C	D ° 5 28.7	4	17	708	1.24	5.25	4.01	-11.5	2	.003	0 0 34.5	- 12.0
"	3	3 36	XCVII	D ° 3 44.4	4			1.24	5.25	4.01	-16.7				
Dec.	31	3 38	XCIX	D ° 4 32.0	4	17	489	1.24	5.25	4.01	-16.7	13	.027	0 0 23.8	+ 5.7
"	29	3 21	XCVI	D ° 3 38.8	4			1.24	5.25	4.01	-16.7				
"	31	3 26	XCIX	D ° 5 7.2	4	16	491	1.24	5.25	4.01	-16.7	- 1	.002	0 0 44.2	+ 10.6
April	1	3 6	XCVII	D ° 6 4.3	4			0.81	5.03	4.22	-12.6				
"	1	3 6	CI	D ° 6 35.3	4	17	681	1.24	5.25	4.01	-12.0	-27	.040	0 0 15.8	+ 5.3

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Sta. — 1st Sta in feet	
1853	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc			
							Signal	Instrument	Difference	Angle in seconds					
April	2	5 3	XCIX	D o 6 21'9	4		0'77	4'98	4'21	-12'2			0 0 6'3	- 2'0	
"	1	5 4	CI	D o 6 9'8	4	18	705	0'89	5'25	4'36	-12'6	-11	'016	0 0 6'3	- 2'0
Mar.	30	2 53	C	D o 4 42'4	4			0'88	5'03	4'15	-14'6			0 0 46'5	+ 13'2
"	31	2 58	CI	D o 6 14'8	4	15	578	1'24	5'25	4'01	-14'1	-25	'043	0 0 46'5	+ 13'2
Feb.	3	3 46	C	D o 3 39'7	4			0'00	5'25	5'25	-36'8			0 0 48'2	- 6'9
"	4	3 49	Jhok*	D o 1 55'2	4	15	291	1'24	5'33	4'09	-28'7	11	'038	0 0 48'2	- 6'9
April	2	3 34	CI	D o 6 5'4	4			2'13	5'25	3'12	-13'5			0 1 31'0	- 21'1
Mar.	29	3 36	Jhok*	D o 3 9'0	4	18	472	0'88	5'28	4'40	-19'0	-25	'053	0 1 31'0	- 21'1
Feb.	5	3 51	Jhok*	D o 1 27'5	4			8'79	5'33	3'46	+ 8'8			0 4 37'4	+ 109'6
"	11	3 46	CIII	D o 10 59'4	4	14	805	1'92	5'25	3'33	- 8'4	29	'036	0 4 37'4	+ 109'6
Jan.	27	3 54	C	D o 5 49'1	4			8'79	5'25	3'54	+ 6'7			0 2 29'7	+ 78'9†
Feb.	10	3 57	CIII	D o 10 36'0	4	15	1074	15'33	5'25	10'08	+19'1	32	'030	0 2 29'7	+ 78'9†
"	6	3 57	CI	D o 1 9'4	4			8'79	5'25	3'54	+10'5			0 4 1'8	+ 81'4
"	11	3 52	CIII	D o 9 35'4	4	18	686	1'24	5'25	4'01	-11'9	21	'031	0 4 1'8	+ 81'4
"	13	4 36	Jhok*	D o 4 3'7	4			1'09	5'33	4'24	- 9'5			0 2 14'2	+ 60'0
"	13	4 39	CII	D o 8 30'8	2	14	911	1'58	5'25	3'67	- 8'2	87	'095	0 2 14'2	+ 60'0
"	11	3 39	CIII	D o 7 45'8	4			1'24	5'25	4'01	-13'4			0 2 57'0	- 52'9
"	13	3 41	CII	D o 1 51'9	4	36	609	1'24	5'25	4'01	-13'4	29	'048	0 2 57'0	- 52'9
"	12	3 45	CII	E o 4 54'9	4			1'24	5'25	4'01	+15'9			0 9 9'1	+ 138'5
"	16	3 45	CIV	D o 13 23'3	4	25	514	1'24	5'25	4'01	-15'9	19	'037	0 9 9'1	+ 138'5
"	11	3 33	CIII	D o 4 25'9	4			1'24	5'25	4'01	- 8'2			0 3 2'0	+ 89'0
"	17	3 34	CIV	D o 10 29'9	4	36	997	1'24	5'25	4'01	- 8'2	59	'059	0 3 2'0	+ 89'0
Mar.	25	3 30	CII	D o 0 56'8	4			1'24	5'25	4'01	-11'2			0 4 59'7	+ 107'1
April	12	3 30	CV	D o 10 56'1	4	25	729	1'24	5'25	4'01	-11'2	19	'026	0 4 59'7	+ 107'1
"	9	3 27	CIII	D o 1 59'9	4			22'05	5'25	16'80	+48'8			0 2 38'4	+ 54'6
"	12	3 24	CV	D o 7 20'3	4	36	702	20'83	5'25	15'58	+45'2	24	'034	0 2 38'4	+ 54'6

\* An auxiliary station. † Rejected.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1853	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference	Angle in seconds				
Mar. 24	h 3 m 44	CIV	D o 7 4'3	4	+	668	1'24	5'25	4'01	-12'2	16	'024	o 1 33'9	- 30'7
April 12	3 43	CV	D o 3 56'6	4			1'24	5'25	4'01	-12'2				
Feb. 17	3 46	CIV	E o 37 52'6	4		909	1'24	5'25	4'01	+ 9'0	57	'063	o 44 39'5	+1195'9
" 21	3 48	CVI	D o 51 26'4	4	54		1'24	5'25	4'01	- 9'0				
April 13	3 36	CV	E o 31 30'2	4		1057	1'24	5'25	4'01	+ 7'7	64	'061	o 39 22'2	+1225'7
Feb. 23	3 31	CVI	D o 47 14'1	4	48		1'24	5'25	4'01	- 7'7				
" 18	3 39	CIV	D o o 43'7	4		972	1'24	5'25	4'01	- 8'4	60	'062	o 6 31'0	+ 186'6
" 24	3 40	CVII	D o 13 45'7	4	54		1'24	5'25	4'01	- 8'4				
" 21	3 24	CVI	D o 56 33'6	4		667	1'24	5'25	4'01	-12'3	40	'060	o 51 27'5	-1010'5
" 24	3 24	CVII	E o 46 21'4	4	303		1'24	5'25	4'01	+12'3				
" 24	3 33	CVII	D o 4 40'8	4		861	1'24	5'25	4'01	- 9'5	49	'057	o 1 50'7	+ 46'7
" 25	3 34	(XXIII)	D o 8 22'1	4	93		1'24	5'25	4'01	- 9'5				
" 21	3 38	CVI	D o 37 56'7	4		1101	1'24	5'25	4'01	- 7'4	63	'057	o 29 42'1	- 963'0
" 25	3 42	(XXIII)	E o 21 27'4	4	303		1'24	5'25	4'01	+ 7'4				
" 22	3 48	CVI	D o 38 33'0	4		638	1'24	5'25	4'01	-12'8	37	'058	o 33 38'4	- 631'9
April 16	3 48	CVIII	E o 28 43'7	4	303		1'24	5'25	4'01	+12'8				
" 13	3 41	CV	E o 18 49'1	4		807	1'24	5'25	4'01	+10'1	44	'055	o 24 58'8	+ 593'5
" 16	3 41	CVIII	D o 31 8'5	4	48		1'24	5'25	4'01	-10'1				
Feb. 23	3 39	CVI	D o 19 16'6	4		850	1'24	5'25	4'01	- 9'6	49	'058	o 12 50'6	- 321'4
April 17	3 37	CIX	E o 6 24'5	4	303		1'24	5'25	4'01	+ 9'6				
" 16	3 31	CVIII	E o 6 11'3	4		840	1'24	5'25	4'01	+ 9'7	45	'054	o 12 36'1	+ 311'5
" 17	3 31	CIX	D o 19 o'8	4	171		1'24	5'25	4'01	- 9'7				
Feb. 22	3 38	CVI	D o 19 39'0	4		1067	1'24	5'25	4'01	- 7'7	61	'057	o 11 38'6	- 365'8
April 19	3 42	(XXV)	E o 3 38'2	4	303		1'24	5'25	4'01	+ 7'7				
" 17	3 49	CIX	D o 7 13'1	4		572	1'24	5'25	4'01	-14'3	27	'047	o 2 40'0	- 44'9
" 19	3 52	(XXV)	D o 1 53'2	4	236		1'24	5'25	4'01	-14'3				
Feb. 26	3 33	(XXIII)	E o 17 13'6	4		858	1'24	5'25	4'01	+ 9'5	51	'059	o 23 40'7	+ 598'3
April 19	3 36	(XXV)	D o 30 7'7	4	102		1'24	5'25	4'01	- 9'5				

NOTE.—(XXIII) and (XXV) appertain to base-line figures.

**PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.**

**KARACHI LONGITUDINAL SERIES.**

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow
(III) . . .	1802.19	...	†	S	XIV. . . .	...	1463	4	S
(IV) . . .	...	1780	10	S	XV . . . .	...	1622	3	S
I . . . .	...	1749	15	S	XVI. . . .	...	1360	5	S
II . . . .	...	1811	4	S	XVII . . . .	...	1582	3	S
III . . . .	...	1776	5	S	XVIII . . . .	...	1659	9	S
IV . . . .	...	1842	5	S	XIX. . . .	...	1591	1	‡
V . . . .	...	1834	3	S	XX . . . .	...	1920	7	S
VI . . . .	...	1736	4	S	XXI. . . .	...	1525	5	S
VII . . . .	...	1822	6	S	XXII . . . .	...	1860	8	S
VIII. . . .	...	1682	4	S	XXIII . . . .	...	1532	6	S
IX . . . .	...	1645	4	S	XXIV . . . .	...	1804	3	S
X . . . .	...	1601	3	S	XXV . . . .	...	1855	5	S
XI . . . .	...	1437	4	S	XXVI . . . .	...	1951	7	S
XII . . . .	...	1628	4	S	XXVII . . . .	...	1954	2	S
XIII . . . .	...	1441	8	S	XXVIII . . . .	...	1910	3	S

NOTE.—(III) and (IV) appertain to base-line figures. \* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally. † Not forthcoming. ‡ No pillar at this station. (see description page 8—B).

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow
XXIX . . .	...	2089	3	S	LIX . . .	...	134	1	S
XXX . . .	...	1599	4	S	LX . . .	...	180	6	S
XXXI . . .	...	2262	3	S	LXI . . .	...	56	8	S
XXXII . . .	...	2574	3	S	LXII . . .	...	212	2	S
XXXIII . . .	...	2369	3	S	LXIII . . .	...	269	†	S
XXXIV . . .	...	3577	3	S	LXIV . . .	...	100	4	S
XXXV . . .	...	3433	3	S	LXV . . .	...	428	†	S
XXXVI . . .	...	3876	3	S	LXVI . . .	...	374	3	S
XXXVII . . .	...	3827	3	S	LXVII . . .	...	460	3	S
XXXVIII . . .	...	3607	3	S	LXVIII . . .	...	492	3	S
XXXIX . . .	...	3599	6	S	LXIX . . .	...	595	3	S
XL . . .	...	3080	4	S	LXX . . .	...	512	3	S
XLI . . .	...	2098	3	S	LXXI . . .	...	588	3	S
XLII . . .	...	5650	4	S	LXXII . . .	...	520	3	S
XLIII . . .	...	3575	0		LXXIII . . .	...	539	9	S
XLIV . . .	...	3252	3	S	LXXIV . . .	...	485	6	S
XLV . . .	...	1809	0		LXXV . . .	...	518	3	S
XLVI . . .	...	673	9	S	LXXVI . . .	...	474	3	S
XLVII . . .	...	1459	2	S	LXXVII . . .	...	382	3	S
XLVIII . . .	...	625	6	S	LXXVIII . . .	...	408	3	S
XLIX . . .	...	652	3	S	LXXIX . . .	...	479	3	S
L . . .	...	456	3	S	LXXX . . .	...	349	3	S
LI . . .	...	362	8	S	LXXXI . . .	...	278	3	S
LII . . .	...	323	6	S	LXXXII . . .	...	302	3	S
LIII . . .	...	221	15	S	LXXXIII . . .	...	333	3	S
LIV . . .	...	290	12	S	LXXXIV . . .	...	46	20	S
LV . . .	...	161	6	S	LXXXV . . .	...	44	20	S
LVI . . .	...	162	25	S	LXXXVI . . .	...	47	24	S
LVII . . .	...	132	2	S	LXXXVII . . .	...	58	15	S
LVIII . . .	...	92	14	S	LXXXVIII . . .	...	49	20	S

\* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally. † Not forthcoming.

## PRINCIPAL TRIANGULATION—HEIGHTS ABOVE MEAN SEA LEVEL.

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow
LXXXIX . . .	...	54	10	S	CI . . .	...	88	42	S
XC . . .	...	56	20	S	Jhok . . .	...	63	†	‡
XCI . . .	...	63	15	S	CII . . .	...	121	3	S
XCH . . .	...	72	24	S	CIII . . .	...	174	3	S
XCHH . . .	...	59	12	S	CIV . . .	...	260	3	S
XCIV . . .	...	93	15	S	CV . . .	...	230	3	S
XCV . . .	...	67	32	S	CVI . . .	...	1456	3	S
XCVI . . .	...	78	38	S	CVII . . .	...	445	3	S
XCVII . . .	...	83	18	S	CVIII . . .	...	824	3	S
XCVIII . . .	...	73	20	S	CIX . . .	...	1135	3	S
XCIX . . .	...	88	37	S	(XXIII) . . .	...	491	3	S
C . . .	...	72	44	S	(XXV) . . .	...	1091	3	S

When determining the preceding spirit levelled height of III or Súrntál Hill Station given on page 72<sub>b</sub> the levelling staff stood on the mark-stone let into the upper surface of the pillar. The heights determined trigonometrically always refer to the upper mark-stone, or to the upper surface of the pillar on which the theodolite stood.

NOTE.—(XXIII) and (XXV) appertain to base-line figures. \* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally. † Not forthcoming. ‡ An auxiliary station on a building in the village of Jhok.

J. B. N. HENNESSEY.

PRINCIPAL TRIANGULATION. AZIMUTHAL OBSERVATIONS.

KARACHI LONGITUDINAL SERIES.

Observations at I,

Lat. N.  $24^{\circ} 6' 19'' \cdot 17$ , Long. E.  $77^{\circ} 35' 41'' \cdot 29 = 5^h 10^m 22 \cdot 8^s = 0 \cdot 216$ , Height above mean sea level 1749 feet,

observed by Captain T. Renny

with Troughton & Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R.M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1849	No. 3042 B.A.C. (opp.) (B.A.C.)	East	L. 198 33	° ' "	Level readings insufficient	<i>h</i> <i>m</i> <i>s</i>	' "	° ' "	$\pi + 9^{\circ} 24' 19'' \cdot 52$	"	L. $181^{\circ} 29' 35'' \cdot 77$
- 7 49 54 <sup>·</sup> 12				° 30 17 <sup>·</sup> 15		- 4 48 <sup>·</sup> 74	- 7 54 42 <sup>·</sup> 86	36 <sup>·</sup> 66			
50 27 <sup>·</sup> 82				28 26 <sup>·</sup> 17		4 14 <sup>·</sup> 74	42 <sup>·</sup> 56	36 <sup>·</sup> 96			
R. 18 33				52 46 <sup>·</sup> 28		19 19 <sup>·</sup> 29	1 57 <sup>·</sup> 98	44 <sup>·</sup> 26		35 <sup>·</sup> 26	
53 5 <sup>·</sup> 58				17 33 <sup>·</sup> 32		1 37 <sup>·</sup> 46	43 <sup>·</sup> 04	36 <sup>·</sup> 48			
54 8 <sup>·</sup> 38				10 11 <sup>·</sup> 41		0 32 <sup>·</sup> 92	41 <sup>·</sup> 30	38 <sup>·</sup> 22			
54 19 <sup>·</sup> 16				8 29 <sup>·</sup> 44		0 22 <sup>·</sup> 87	42 <sup>·</sup> 03	37 <sup>·</sup> 49			
L. 198 33	54 43 <sup>·</sup> 54	0 1 <sup>·</sup> 55	43 <sup>·</sup> 54	35 <sup>·</sup> 98							

NOTE.—R.M. stands for referring mark. B.A.C. for British Association Catalogue, London 1845.





Observations at I—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1849	No. 3042 B.A.C. (opp:) (B. A. C.)	West	L. 189 17	+ 10 48 54.42	Level readings insufficient	h m s	' "	° ' "	$\pi - 9^{\circ} 24' 19'' 03$	"	L. 181° 29' 41".48	
						0 30 51.25	+ 5 5.11	+ 10 53 59.53		40.50		
			R. 9 17	49 38.80		28 30.28	4 20.28	59.08		40.05		
				51 37.86		20 57.39	2 20.45	58.31		39.28		
			L. 189 17	51 52.34		19 32.41	2 2.06	54.40		35.37		
				53 24.02		11 14.52	0 40.32	64.34		45.31		
			R. 9 17	53 30.92		9 24.55	0 28.23	59.15		40.12		
				53 57.16		1 46.65	0 1.01	58.17		39.14		
				54 1.08		0 5.32	0 0.00	61.08		42.05		
			L. 189 17	53 32.64		9 28.19	0 28.44	61.08		42.05		
				53 19.60		11 16.17	0 40.25	59.85		40.82		
			R. 9 17	52 1.82		19 1.06	1 54.32	56.14		37.11		
				51 41.12		20 40.04	2 14.94	56.06		37.03		
30th January			No. 3042 B.A.C. (opp:) (B. A. C.)	East		L. 180 1	- 7 50 29.70	Level readings insufficient		0 28 7.87		- 4 9.32
						26 18.90	3 38.32		36.24	42.61		
		R. 0 1			52 37.96	19 41.99	2 2.64		40.60	38.25		
					53 2.72	17 50.02	1 40.56		43.28	35.57		
		L. 180 1			53 59.82	11 6.11	0 39.06		38.88	39.97		
					54 10.50	9 39.14	0 29.54		40.04	38.81		
		R. 0 1			54 40.52	2 5.24	0 1.39		41.91	36.94		
					54 45.78	0 4.27	0 0.00		45.78	33.07		
		L. 180 1			54 19.24	8 26.61	0 22.73		41.97	36.88		
					54 4.66	10 12.58	0 33.25		37.91	40.94		
		R. 0 1			53 7.76	17 9.48	1 34.06		41.82	37.03		
					52 49.20	18 59.45	1 55.28		44.48	34.37		
		R. 0 1			+ 10 48 59.44	0 30 12.99	+ 4 52.59		+ 10 53 52.03	33.33		
					49 43.42	28 8.02	4 13.52		56.94	38.24		
	L. 180 1	51 40.66	20 44.13	2 17.49	58.15	39.45						
		52 4.92	18 52.16	1 53.80	58.72	40.02						
	R. 0 1	53 13.30	11 1.28	0 38.75	52.05	33.35						
		53 26.82	9 30.30	0 28.81	55.63	36.93						
	L. 180 1	53 58.60	2 19.41	0 1.72	60.32	41.62						

Observations at I—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1849											
30th January	No. 3042 B.A.C. (opp.) (B.A.C.)	West (contd.)	L. 180 I	0' 53' 57.86 + 10	Level readings insufficient	h m s	' "	0' 53' 57.86 + 10	π - 9° 24' 18".70	"	R. 181° 29' 35".33
			R. 0 I	53 32.04		0 0 6.44	+ 0 0.00	55.53		39.16	
				53 15.90		8 36.42	0 23.49	52.01		36.83	
			L. 180 I	51 48.22		10 40.39	0 36.11	61.25		33.31	
				51 23.86		20 31.24	2 13.03	59.04		42.55	
						22 10.22	2 35.18			40.34	
			R. 27 50	- 7 51 26.28		0 24 56.82	+ 3 16.29	- 7 54 42.57		35.95	
				51 53.88		23 4.85	2 48.14	42.02		36.50	
			L. 207 49	53 32.56		14 24.99	1 5.79	38.35		40.17	
				53 47.64		12 29.02	0 49.36	37.00		41.52	
			R. 27 50	54 37.48		3 40.16	0 4.28	41.76		36.76	
				54 43.34		0 9.21	0 0.01	43.35		35.17	
			L. 207 49	54 13.26		8 34.65	0 23.46	36.72	41.80		
				54 4.08		10 27.62	0 34.90	38.98	39.54		
			R. 27 50	53 4.84		17 29.50	1 37.76	42.60	35.92		
				52 43.80		19 24.47	2 0.41	44.21	34.31		
			L. 207 49	50 34.44		27 32.34	4 2.89	37.33	41.19		
				49 56.26		29 36.31	4 40.84	37.10	41.42		
			R. 27 50	+ 10 50 22.46		0 25 56.81	+ 3 35.54	+ 10 53 58.00	39.64		
				51 1.80		23 32.85	2 57.43	59.23	40.87		
			L. 207 49	53 7.02		12 28.00	0 49.59	56.61	38.25		
				53 25.20		10 35.03	0 35.72	60.92	42.56		
				54 1.18		0 26.18	0 0.06	61.24	42.88		
				53 59.98		1 3.80	0 0.36	60.34	41.98		
			R. 27 50	53 28.54	8 52.69	0 25.00	53.54	35.18			
				53 18.38	10 38.66	0 35.91	54.29	35.93			
				52 30.62	16 9.58	1 22.62	53.24	34.88			
				52 13.38	17 44.56	1 39.54	52.92	34.56			
			L. 207 49	50 47.24	24 46.46	3 13.60	60.84	42.48			
				50 25.52	25 50.45	3 30.55	56.07	37.71			
31st January	No. 3042 B.A.C. (opp.) (B.A.C.)	West							π - 9° 24' 18".36		R. 181° 29' 36".84 L. 181° 29' 40".98
31st January	No. 8042 B.A.C. (opp.) (B.A.C.)	East							π + 9° 24' 18".52		L. 181° 29' 35".77 R. 181° 29' 40".94
31st January	No. 8042 B.A.C. (opp.) (B.A.C.)	West (contd.)							π - 9° 24' 18".70		

Observations at I—(Continued).

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	181 29 37.54
Do. do. do. by Western do.	...	...	...	...	181 29 39.66
Concluded do. do. by both Elongations	...	...	...	...	<u>181 29 38.60</u>
Angle IV and R. M., see page 24—B.	...	...	...	32° 23' 46".77	
Proportional part of correction to find final value of ditto, see pages 23—B and 24—B, and triangle No. 62, page 31—b ...				0.00 —	<u>32 23 46.77</u>
Observed Azimuth of IV	...	...	...	...	149 5 51.83
Computed do. do. in terms of the initial value } adopted at Kalánpúr, see page 44—b	...	...	...	...	149 5 50.46
Observed—Computed Azimuth	...	...	...	...	<u>+ 1.37</u>

Observations at V,

Lat. N. 24° 14' 52".08, Long. E. 77° 17' 29".59 = <sup>h m s</sup> 5 9 10.0 = <sup>d</sup> 0.215, Height above mean sea level 1834 feet,

observed by Captain T. Renny

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R.M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1849	No. 3906 B.A.C. (opp.) (B.A.C.)	West	R. 0 2	0 1 "	Level readings insufficient	<sup>h m s</sup>	' "	0 1 "	π — 8° 49' 41".69	"	L. 175° 36' 46".33* R. 175 36 45.61*
+ 4 24 3.84			0 21 54.0	+ 2 24.18		+ 4 26 28.02	46.33				
24 35.86			19 13.0	1 50.96		26.82	45.13				
L. 180 2			10 13.0	0 31.30		28.68	46.99				
25 57.38			7 27.0	0 16.63		26.29	44.60				
26 9.66			0 3.0	0 0.00		28.86	47.17				
26 28.86											
26 26.26	2 47.0	0 2.32	28.58	46.89							

\* For the remaining observations on these Zeros, see 12th March.

Observations at V—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.						
						In Time	In Arc			Seconds of each observation	Mean by each Face					
1849	No. 3906 B.A.C. (opp.) (B.A.C.)	East	R. 0 2	0 1 -13 12 52.10 12 53.34	Level readings insufficient	h m s	' "	0 1 1 -13 12 54.88 53.38	$\pi + 8^{\circ} 49' 41'' .50$	46.62 48.12	L. 175° 36' 50".33 R. 175 36 48 .37					
			L. 180 2	12 29.14 12 19.48 11 16.48 10 47.06		8 30.8 10 19.8 17 44.8 20 19.8	0 21.72 0 32.00 1 34.59 2 4.22	50.86 51.48 51.07 51.28				50.64 50.02 50.43 50.22				
			R. 0 2	8 53.84 8 18.94		28 10.8 30 4.8	3 59.03 4 32.45	52.87 51.39				48.63 50.11				
			L. 189 18	+ 4 21 25.58 22 16.36		0 31 38.1 28 55.1	+ 5 1.45 4 11.79	+ 4 26 27.03 28.15				45.69 46.81				
			R. 9 18	24 32.04 24 52.06		19 29.1 17 27.1	1 54.09 1 31.48	26.13 23.54				44.79 42.20				
			L. 189 18	25 56.06 26 5.20		10 27.1 8 49.1	0 32.76 0 23.31	28.82 28.51				47.48 47.17				
		R. 9 18	26 29.12 26 27.60	1 8.1		0 0.39	29.51	48.17								
		L. 189 18	26 1.84 26 27.60	0 33.9 8 49.9		0 0.10 0 23.27	27.70 25.11	46.36 43.77								
		10th March	No. 3906 B.A.C. (opp.) (B.A.C.)	East		R. 9 18	-13 12 51.10 12 53.80	0 4 37.9		- 0 6.41		-13 12 57.51	$\pi - 8^{\circ} 49' 41'' .16$	43.65	L. 175° 36' 47".42 R. 175 36 47 .04	
						L. 189 18	12 31.60 12 17.84	0 1.1 8 47.1		0 0.00 0 23.14		53.80 54.74				47.36 46.42
						R. 9 18	11 14.50 10 53.66	10 51.1 17 59.1		0 35.32 1 37.17		53.16 51.67				48.00 49.49
						L. 189 18	9 18.78 8 53.46	19 58.1 26 42.1		1 59.82 3 34.55		53.48 53.33				47.68 47.83
R. 18 36	+ 4 21 19.80 21 49.84				28 15.1	4 0.28	53.74	47.42								
L. 198 36	23 52.56 24 14.74				0 32 2.1 30 15.1	+ 5 9.14 4 35.61	+ 4 26 28.94 25.45	47.94 44.45								
10th March	No. 3906 B.A.C. (opp.) (B.A.C.)	West	R. 18 36	21 49.84 23 52.56	22 31.1	2 32.48	25.04	$\pi - 8^{\circ} 49' 41'' .00$	44.04	45.89						
			L. 198 36	24 14.74	20 58.1	2 12.15	26.89									

Observations at V—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1849											
10th March	No. 3906 B.A.C. (opp.) (B.A.C.)	West (contd.)	R. 18 36	+ 4 25 23.34 25 34.56		h m s 0 14 10.1	' " + 1 0.24	+ 4 26 23.58 21.95	$\pi - 8^{\circ} 49' 41''.00$	" 42.58 40.95	R. 175° 36' 43''.98
			L. 198 36	26 18.50 26 27.52		5 9.1 0 2.9	0 7.95 0 0.00	26.45 27.52		45.45 46.52	
11th March	No. 3906 B.A.C. (opp.) (B.A.C.)	East	R. 18 36	- 13 12 55.08 12 50.76		0 0 4.5 2 28.5	- 0 0.00 0 1.83	- 13 12 55.08 52.59	$\pi + 8^{\circ} 49' 40''.81$	45.73 48.22	
			L. 198 36	12 25.56 12 15.22		9 34.5 11 25.5	0 27.48 0 39.15	53.04 54.37		47.77 46.44	
			R. 18 36	11 4.36 10 43.08		18 59.5 20 51.5	1 48.37 2 10.78	52.73 53.86		48.08 46.95	
			L. 198 36	9 15.36 9 2.64		26 49.5 27 43.5	3 36.56 3 51.38	51.92 54.02		48.89 46.79	L. 175° 36' 47''.47 R. 175 36 47 .24
11th March	No. 3906 B.A.C. (opp.) (B.A.C.)	West	R. 27 52	+ 4 21 54.68 22 26.76	Level readings insufficient	0 30 3.8 28 18.8	+ 4 32.16 4 1.30	+ 4 26 26.84 28.06	$\pi - 8^{\circ} 49' 40''.65$	46.19 47.41	
			L. 207 52	24 11.34 24 33.80		21 14.8 19 29.8	2 15.68 1 54.22	27.02 28.02		46.37 47.37	
			R. 27 52	25 44.62 25 57.56		11 50.8 10 19.8	0 42.09 0 32.00	26.71 29.56		46.06 48.91	L. 175° 36' 47''.39 R. 175 36 47 .14
			L. 207 52	26 22.30 26 29.10		4 21.8 0 5.2	0 5.70 0 0.00	28.00 29.10		47.35 48.45	
12th March	No. 3906 B.A.C. (opp.) (B.A.C.)	East	L. 207 52	- 13 12 28.06 12 16.16		0 9 15.7 11 3.7	- 0 25.71 0 36.69	- 13 12 53.77 52.85	$\pi + 8^{\circ} 49' 40''.46$	46.69 47.61	L. 175° 36' 47''.53* R. 175 36 50 .26*
			R. 27 52	3 20.56 2 19.08		43 24.7 45 44.7	9 28.83 10 31.84	49.39 50.92		51.07 49.54	
		West	R. 0 0	+ 4 23 11.08 24 16.46		0 25 25.2 20 46.2	+ 3 14.39 2 9.66	+ 4 26 25.47 26.12	$\pi - 8^{\circ} 49' 40''.29$	45.18 45.83	
			L. 180 0	25 41.12 25 55.06		12 30.2 10 21.2	0 46.90 0 32.14	28.02 27.20		47.73 46.91	Vide 8th March

\* For the remaining observations on these Zeros, see 13th March.

Observations at V—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1849	No. 3906 B.A.C. (opp:) (B.A.C.)	West (contd.)	R. 0 0	+ 4 26 26.38	Level readings insufficient	h m s	l "	o ' "	π - 8° 49' 40".29	"	Vide 8th March
0 0 11.2			+ 0 0.01	+ 4 26 26.39		46.10					
2 57.8			0 2.63	25.39		45.10					
10 15.8			0 31.41	26.59		46.30					
11 31.8			0 39.62	24.32		44.03					
0 1 45.2			- 0 0.92	- 13 12 46.84		53.28					
4 2.2		0 4.88	46.90	53.22							
11 45.2		0 41.43	52.57	47.55							
14 4.2		0 59.41	51.55	48.57							
21 5.2		2 13.64	53.18	46.94							
22 49.2		2 36.57	52.59	47.53							
29 35.2		4 23.55	53.15	46.97							
30 44.2	4 44.52	52.30	47.82								
18th March	No. 3906, B.A.C. (opp:) (B.A.C.)	East	R. 27 50	- 13 12 45.92	Level readings insufficient	h m s	l "	o ' "	π + 8° 49' 40".12	"	Vide 12th March
				12 42.02		53.28					
L. 207 50			12 11.14	52.57		47.55					
			11 52.14	51.55		48.57					
R. 27 50			10 39.54	53.18		46.94					
			10 16.02	52.59		47.53					
L. 207 50	8 29.60	53.15	46.97								
	8 7.78	52.30	47.82								

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	175 36 48.21	
Do. do. do. by Western do.	...	...	...	...	175 36 45.94	
Concluded do. do. by both Elongations	...	...	...	...	175 36 47.08	
Angle R. M. and VII, see page 27—B.	...	...	...	...	+ 0 21 23.08	
Observed Azimuth of VII	...	...	...	...	175 58 10.16	
Computed do. do. in terms of the initial value adopted at	}					175 58 10.89
Kalánpúr, see page 44—b						
Observed—Computed Azimuth	...	...	...	...	- 0.73	

Observations at IX,

Lat. N. 24° 14' 10"·67, Long. E. 76° 39' 16"·38 = <sup>h m s d</sup>5 6 37·1 = 0·213, Height above mean sea level 1,645 feet,

observed by Captains T. Renny and A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
				o' ' "	"	<sup>h m s</sup>	' "	o' ' "		"	"
1849 5th April	<i>a</i> Ursæ Minoris (conj.) (N.A.)	West	R. o 1	-22 29 43'22	-0·60	<sup>h m s</sup> 0 12 48·85	+ 0 9'23	-22 29 34'59	π - 1° 38' 24"·89	60·52 60·49 60·63 61·25	L. 155° 51' 61"·19 R. 155 51 60·84
			L. 180 1	29 36'80	+1·52	3 45'97	0·80	34'62 34'48			
				29 35'74	"	2 31'99	0·36	33'86			
				29 37'74	"	6 20'89	2·26	33'96			
				29 38'56	"	8 3'86	3·65	33'39			
				29 48'64	-0·60	16 43'74	15'71	33'53			
		R. o 1	29 53'70	"	18 51'71	19'96	34'34	61·58			
		L. 180 1	-25 45 48'62	+3·09	0 25 24'86	- 0 36'21	-25 46 21'74	63'31			
			45 53'68	"	23 38'89	31'36	21'95	63'10			
		R. o 1	46 3'14	-3·38	16 49'98	15'90	22'42	62'63			
		L. 180 1	46 8'46	"	14 8'01	11'21	23'05	62'00			
		L. 180 1	46 23'68	+3·09	6 14'12	2'18	22'77	62'28			
R. o 1	46 25'36	"	4 35'14	1'18	23'45	61'60					
R. o 1	46 21'18	-3·38	2 59'75	0'50	25'06	59'99					
	46 17'04	"	5 37'72	1'78	22'20	62'85					
6th April	<i>a</i> Ur. Min. (conj.) (N.A.)	West	R. 9 17	-22 29 32'98	-0·96	0 3 41'85	+ 0 0'77	-22 29 33'17	π - 1° 38' 25"·22	61'61 61'48 60'95 60'49	L. 155° 51' 61"·04
				29 32'34	"	0 6'90	0'00	33'30			
			L. 189 17	29 39'66	+1·71	8 33'98	4'12	33'83			
				29 41'78	"	10 8'96	5'78	34'29			

NOTE.—N. A. stands for Nautical Almanac; Observations on the 5th and 7th were taken by Captain T. Renny and those on the 6th and 8th by Captain A. Strange.





Observations at IX—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1849												
8th April	<i>a</i> Urse Minoris (conj.) (N.A.)	West	R. 27 49	0 29 43'40	+0'91	h m s	0 15 13'43	+ 0 13'03	0 29 29'46	$\pi - 1^{\circ} 38' 25''.90$	64'64	L. 155° 51' 62''.38 R. 155 51 62.84
				29 41'66	"	13 12'46	9'81	30'94	63'16			
			L. 207 49	29 34'42	-0'39	5 54'57	1'96	32'85	61'25			
				29 30'60	"	0 0'34	0'00	30'99	63'11			
			R. 27 49	29 38'06	+0'91	9 0'20	4'55	32'60	61'50			
				29 39'38	"	10 41'18	6'41	32'06	62'04			
		L. 207 49	29 50'00	-0'39	18 13'07	18'62	31'77	62'33				
			29 53'16	"	19 56'04	22'29	31'26	62'84				
		L. 207 49	- 25 45 51'10	-0'42	0 24 18'00	- 0 33'11	- 25 46 24'63	61'48				
			45 55'14	"	22 13'03	27'68	23'24	62'87				
		R. 27 49	46 13'78	+0'42	15 7'12	12'83	26'19	59'92				
			46 16'72	"	13 27'14	10'16	26'46	59'65				
		46 25'40	"	5 36'25	1'76	26'74	59'37					
		46 25'90	"	0 34'32	0'02	25'50	60'61					
	L. 207 49	46 24'38	-0'42	5 40'60	1'81	26'61	59'50					
		46 23'06	"	7 24'57	3'09	26'57	59'54					

Mean Azimuth of R. M. by Eastern Elongation	...	155 52 1'60, $w = 5'52, \frac{1}{w} = 0'18$
Do. do. do. by Western do.	...	155 52 2'06, $w = 8'16, \frac{1}{w} = 0'12$
Concluded do. do. by both Elongations	...	155 52 1'87, $w = 13'68, \frac{1}{w} = 0'07$
Angle R. M. and XI, see page 31— <i>B</i> .	...	... + 25 39 32'82, $w = 20'48, \frac{1}{w} = 0'05$
Observed Azimuth of XI	...	181 31 34'69, $w = 8'33, \frac{1}{w} = 0'12$
Computed do. do. in terms of the initial value adopted at Kaliánpúr, see page 45— <i>b</i>	...	181 31 34'62
Observed—Computed Azimuth	...	... + 0'07

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XVI,

Lat. N. 24° 25' 32".46, Long. E. 76° 7' 29".34 =  $5^h 4^m 30^s \cdot 0 = 0 \cdot 211$ , Height above mean sea level 1,360 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1849			° ' "	° ' "	"	$h^m s$	' "	° ' "		"	"	
28th November	No. 1448 Camelopardi (opp.) (B.A.C.)	East	R. 0 1	+59 38 9.80	+0.70	0 26 33.49	- 3 55.30	+ 59 34 15.20	$\pi + 9^\circ 58' 28''.59$	43.79	L. 249° 32' 45".86 R. 249 32 43.73	
					37 30.42	"	24 9.53	3 14.89		16.23		44.82
			L. 180 1	35 39.14	+1.07	15 38.66	1 21.98	18.23		46.82		
				35 13.46	"	13 7.70	0 57.79	16.74		45.33		
			R. 0 1	34 17.00	+0.70	3 15.86	0 3.59	14.11		42.70		
			34 14.30	"	0 2.08	0 0.00	15.00	43.59				
		L. 180 1	34 40.68	+1.07	8 20.95	0 23.53	18.22	46.81				
			34 52.76	"	10 35.91	0 37.95	15.88	44.47				
28th November	No. 1448 Camelopardi (opp.) (B.A.C.)	West	R. 0 2	+79 26 31.32	-2.46	0 28 31.92	+ 4 36.32	+ 79 31 5.18	$\pi - 9^\circ 58' 28''.42$	36.76	L. 249° 32' 43".72 R. 249 32 38.37	
				27 23.74	"	25 47.96	3 45.77	7.05		38.63		
			L. 180 2	29 38.76	+0.86	16 37.09	1 33.45	13.07		44.65		
				30 2.18	"	13 57.12	1 5.82	8.86		40.44		
			R. 0 2	31 4.28	-2.46	3 50.27	0 4.97	6.79		38.37		
			31 10.60	"	0 3.32	0 0.00	8.14	39.72				
		L. 180 2	30 53.00	+0.86	8 3.57	0 21.82	15.68	47.26				
			30 33.72	"	10 24.53	0 36.36	10.94	42.52				
29th November	No. 1448 Camelopardi (opp.) (B.A.C.)	East	L. 189 16	+59 37 35.12	-2.94	0 24 14.80	- 3 16.30	+ 59 34 15.88	$\pi + 9^\circ 58' 28''.23$	44.11	L. 249° 32' 42".99 R. 249 32 41.89	
				37 1.78	"	22 10.84	2 44.41	14.43		42.66		
			R. 9 16	35 10.78	+1.06	13 4.98	0 57.39	14.45		42.68		
				34 55.92	"	11 13.01	0 42.21	14.77		43.00		
			L. 189 16	34 23.92	-2.94	3 58.13	0 5.30	15.68		43.91		
				34 15.98	"	0 3.19	0 0.00	13.04		41.27		
			R. 9 16	34 32.78	+1.06	7 54.68	0 21.13	12.71		40.94		
	34 43.72	"	9 44.65	0 32.07	12.71	40.94						



Observations at XVI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1849	No. 1448 Camelopardi (opp.) (B.A.C.)	West (contd.)	L. 207 47	0' 79 31 7'44	" -2.91	h m s	' "	0' 79 31 4'54	$\pi - 9^{\circ} 58' 27''.35$	"	R. 249° 32' 38''.71	
R. 27 47			+ 28 21'10	+1'85	0 0 10'30	+ 0 0'01	22 11'97	2 44'68		7'63		37'19
			24 24'42	"	34 40'79	6 39'93		6'20				40'28
L. 207 47			+ 59 38 2'40	-2'16	0 26 1'79	- 3 46'08	+ 59 34 14'16			41'32		
			37 24'74	"	23 53'83	3 10'69	11'89			39'05		
R. 27 47			35 37'58	+1'45	15 46'95	1 23'42	15'61			42'77		
2nd December		East	L. 207 47	35 17'86	"	13 51'98	1 4'45	14'86	42'02			
			L. 207 47	34 29'24	-2'16	6 0'10	0 12'11	14'97	42'13			
				34 16'32	"	0 1'20	0 0'00	14'16	41'32			
			R. 27 47	34 46'00	+1'45	10 0'65	0 33'85	13'60	40'76			
				35 1'24	"	11 58'61	0 48'47	14'22	41'38			

Mean Azimuth of R. M. by Eastern Elongation ...	249 32 42'99,	$w = 2.24, \frac{1}{w} = 0.45$
Do. do. do. by Western do. ...	249 32 39'95,	$w = 1.76, \frac{1}{w} = 0.57$
Concluded do. do. by both Elongations ...	249 32 41'65,	$w = 4.00, \frac{1}{w} = 0.25$
Angle R. M. and XIII; see page 38— <sub>B</sub> . ...	+ 51 9 14'87,	$w = 7.01, \frac{1}{w} = 0.14$
Observed Azimuth of XIII ...	300 41 56'52,	$w = 2.56, \frac{1}{w} = 0.39$
Proportional part of correction to angle R. M. and XIII; see pages 37— <sub>B</sub> . and 38— <sub>B</sub> . and triangle No. 71, page 32— <sub>b</sub> }	— 0'06,	
Observed Azimuth of XIII (final value) ...	300 41 56'46	
Computed do. do. in terms of the initial value adopted at Kaliánpúr, see page 45— <sub>b</sub> ...	300 41 56'57	
Observed—Computed Azimuth ...	— 0'11	

Observations at XX,

Lat. N. 24° 28' 44".16, Long. E. 75° 29' 19".42 =  $\overset{h}{5} \overset{m}{1} \overset{s}{57.3} = 0.210$ , Height above mean sea level 1920 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.					
						In Time	In Arc			Seconds of each observation	Mean by each Face				
1849						<i>h m s</i>	<i>' "</i>	<i>o ' "</i>		<i>"</i>					
7th November	No. 960 B.A.C. (opp:) (B.A.C.)	East	R. 0 1	+ 5 34 20.14	Level readings insufficient	0 20 4.57	- 1 24.70	+ 5 32 55.44	$\pi + 6^{\circ} 11' 44''.57$	40.01	L. 191° 44' 40''.02* R. 191 44 37.83*				
				32 56.82		0 10.14	0 0.01	56.81		41.38					
			L. 180 1	33 55.10		16 43.91	0 59.27	55.83		40.40					
				34 4.08		18 7.89	1 9.61	54.47		39.04					
			R. 0 1	34 45.28		23 9.82	1 53.69	51.59		36.16					
			34 58.72	24 28.80		2 7.00	51.72	36.29							
		L. 180 1	36 3.90	29 26.73		3 3.86	60.04	44.61							
			36 10.72	30 23.72		3 15.93	54.79	39.36							
				West		L. 180 1	+ 17 54 29.78	0 23 41.46		+ 1 58.94		+ 17 56 28.72	$\pi - 6^{\circ} 11' 44''.37$	44.35	L. 191° 44' 43''.38* R. 191 44 42.49*
				54 44.58	21 58.48	1 42.30	26.88	42.51							
R. 0 1	55 53.42	12 54.62	0 35.26	28.68	44.31										
	56 1.26	11 7.64	0 26.19	27.45	43.08										
L. 180 1	56 29.62	0 8.19	0 0.00	29.62	45.25										
	56 26.32	2 44.16	0 1.58	27.90	43.53										
R. 0 1	56 1.04	11 8.03	0 26.10	27.14	42.77										
	55 51.20	13 13.00	0 36.77	27.97	43.60										
8th November	No. 960 B.A.C. (opp:) (B.A.C.)	East	L. 187 14	+ 5 34 48.78	0 23 19.95	- 1 54.30	+ 5 32 54.48	$\pi + 6^{\circ} 11' 44''.17$	38.65	L. 191° 44' 39''.74 R. 191 44 41.50					
				34 18.74	19 56.00	1 23.50	55.24		39.41						
			R. 7 13	33 31.16	12 34.11	0 33.26	57.90		42.07						
				33 20.38	10 29.13	0 23.16	57.22		41.39						
				33 2.34	4 27.22	0 4.18	58.16		42.33						
				32 56.02	0 4.28	0 0.00	56.02		40.19						
			L. 187 14	33 29.70	12 15.54	0 31.79	57.91		42.08						
	33 46.32	15 37.50	0 51.68	54.64	38.81										

\* For the remaining observations on these Zeros, see 12th November.

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XX—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.						
						In Time	In Arc			Seconds of each observation	Mean by each Face					
1849																
8th November	No. 960 B.A.C. (opp.) (B.A.C.)	West	L. 187 14	+ 17 54 11.54	Level readings insufficient	h m s	' "	° ' "	π - 6° 11' 43".98	"	L. 191° 44' 39".21 R. 191 44 43 .64					
			R. 7 14	54 32.74		0 24 59.85	+ 2 12.44	+ 17 56 23.98				40.00				
				55 46.70		22 45.89	1 49.80	22.54				38.56				
				55 57.22		13 56.02	0 41.08	27.78				43.80				
						11 50.05	0 29.63	26.85				42.87				
		L. 187 14	56 23.16	0 17.77		0 0.02	23.18	39.20								
			56 20.32	3 35.72		0 2.73	23.05	39.07								
		R. 7 14	55 53.28	12 48.58		0 34.54	27.82	43.84								
			55 41.38	14 53.55		0 46.66	28.04	44.06								
9th November		No. 960 B.A.C. (opp.) (B.A.C.)	East	L. 194 24		+ 5 34 57.96		0 24 10.06				- 2 2.61	+ 5 32 55.35	π + 6° 11' 43".79	"	L. 191° 44' 37".97 R. 191 44 36 .79
	R. 14 24			34 22.42	20 30.11	1 28.32	54.10	39.14								
				33 30.00	13 5.21	0 36.05	53.95	37.89								
				33 19.24	11 5.24	0 25.89	53.35	37.74								
	L. 194 24		32 54.96	0 0.60	0 0.00	54.96	38.75									
			32 53.54	2 23.57	0 1.21	52.33	36.12									
	R. 14 24		33 29.00	13 0.42	0 35.79	53.21	37.00									
			33 39.88	15 7.39	0 48.41	51.47	35.26									
9th November	No. 960 B.A.C. (opp.) (B.A.C.)		West	R. 14 24	+ 17 53 32.64		0 28 25.44	+ 2 51.30	+ 17 56 23.94	π + 6° 11' 43".59	"	L. 191° 44' 45".69 R. 191 44 38 .90				
		L. 194 24		53 53.10	26 19.47	2 26.89	19.99	40.35								
				55 26.52	17 21.61	1 3.81	30.33	36.40								
			55 41.44	14 46.64	0 46.22	27.66	46.74									
		R. 14 24	56 22.90	0 10.13	0 0.01	22.91	44.07									
			56 21.38	2 52.09	0 1.74	23.12	39.32									
		L. 194 24	56 0.34	11 51.96	0 29.65	29.99	39.53									
			55 45.82	14 20.92	0 43.33	29.15	46.40									
10th November		No. 960 B.A.C. (opp.) (B.A.C.)	East	L. 201 37	+ 5 33 28.04		0 11 51.94	- 0 29.78	+ 5 32 58.26				π + 6° 11' 43".39	"	L. 191° 44' 42".09	
	R. 21 37			34 4.66	17 32.85	1 5.19	59.47	41.65								
		34 25.14	20 45.80	1 31.32	53.82	42.86										
		34 32.74	22 3.78	1 43.13	49.61	37.21										
						33.00										

Observations at XX—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1849 10th November	No. 960 B.A.C. (opp:) (B.A.C.)	East (contd.)	L. 201 37	+ 5 35 32.90	Level readings insufficient	0 27 0.70	- 2 34.67	+ 5 32 58.23	$\pi + 6^{\circ} 11' 43''.39$	"	R. 191° 44' 35''.12
				35 48.98		28 19.68	2 50.13	58.85		41.62	
			R. 21 37	36 31.96		32 10.62	3 39.59	52.37		42.24	
				36 47.20		33 21.60	3 56.07	51.13		35.76	
										34.52	
11th November	No. 960 B.A.C. (opp:) (B.A.C.)	East	R. 28 49	+ 5 33 37.04	Level readings insufficient	0 13 45.12	- 0 39.80	+ 5 32 57.24	$\pi + 6^{\circ} 11' 43''.01$	40.25	L. 191° 44' 38''.87 R. 191 44 38.44
				33 26.66		12 6.14	0 30.84	55.82		38.83	
			L. 208 49	33 7.22		6 50.22	0 9.85	57.37		40.38	
				32 56.30		3 4.63	0 2.00	54.30		37.31	
			R. 28 49	33 12.94		9 5.54	0 17.48	55.46		38.47	
				33 16.46		10 29.52	0 23.28	53.18		36.19	
12th November	No. 960 B.A.C. (opp:) (B.A.C.)	East	L. 208 49	33 52.56	Level readings insufficient	16 9.44	0 55.26	57.30	$\pi$	40.31	L. 191° 44' 38''.87 R. 191 44 38.44
				33 59.50		17 31.42	1 5.01	54.49		37.50	
12th November	No. 960 B.A.C. (opp:) (B.A.C.)	East	L. 180 1	+ 5 33 26.06	Level readings insufficient	0 11 44.80	- 0 29.05	+ 5 32 57.01	$\pi + 6^{\circ} 11' 42''.61$	39.62	Vide 7th November
				33 10.92		8 42.84	0 16.00	54.92		37.53	
			R. 0 1	32 57.80		2 55.91	0 1.81	55.99		38.60	
				32 55.34		0 0.95	0 0.00	55.34		37.95	
12th November	No. 960 B.A.C. (opp:) (B.A.C.)	West	L. 180 1	33 6.88	Level readings insufficient	5 48.98	0 7.15	59.73	$\pi + 6^{\circ} 11' 42''.61$	42.34	Vide 7th November
				33 7.78		7 52.95	0 13.13	54.65		37.26	
			R. 0 1	33 40.02		15 11.86	0 48.88	51.14		33.75	
				33 59.58		17 20.83	1 3.70	55.88		38.49	
12th November	No. 960 B.A.C. (opp:) (B.A.C.)	West	L. 180 1	+ 17 54 19.94	Level readings insufficient	0 24 28.83	+ 2 6.99	+ 17 56 26.93	$\pi - 6^{\circ} 11' 42''.42$	44.51	Vide 7th November
				54 42.06		21 56.86	1 42.04	24.10		41.68	
			R. 0 1	55 36.98		15 6.94	0 48.35	25.33		42.91	
				55 44.72		13 12.97	0 36.96	21.68		39.26	
			L. 180 1	56 19.80		5 12.07	0 5.72	25.52		43.10	
				56 24.50		0 16.86	0 0.02	24.52		42.10	
12th November	No. 960 B.A.C. (opp:) (B.A.C.)	West	R. 0 1	55 56.88	Level readings insufficient	11 34.72	0 28.23	25.11	$\pi$	42.69	Vide 7th November
				55 46.24		13 20.70	0 37.49	23.73		41.31	

Observations at XX—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1849 13th November	No. 960 B.A.C. (opp:) (B.A.C.)	West	R. 28 49	0 17 53 46.52	Level readings insufficient	h m s	' "	0 17 56 26.53	$\pi - 6^{\circ} 11' 42''.03$	"	L. 191° 44' 47''.37 R. 191 44 42.44		
				54 12.40		0 27 28.48	+ 2 40.01	24.06		44.50			
			L. 208 49	55 30.68		24 55.51	2 11.66	31.09		42.03			
				55 42.88		16 53.62	1 0.41	29.09		49.06			
			R. 28 49	56 24.44		14 46.65	0 46.21	27.09		47.06			
				56 21.04		0 3.16	0 0.00	24.44		42.41			
	L. 208 49	55 54.56	2 55.13	0 1.80		22.84	40.81						
		55 36.16	12 57.00	0 35.30		29.86	47.83						
			15 37.96	0 51.40		27.56	45.53						
	14th November	No. 960 B.A.C. (opp:) (B.A.C.)	West	R. 21 36		+17 54 22.08	0 23 53.09	+ 2 0.87		+ 17 56 22.95	$\pi - 6^{\circ} 11' 41''.64$	"	L. 191° 44' 44''.09 R. 191 44 41.16
						54 46.10	21 18.13	1 36.12		22.22		41.31	
				L. 201 36		55 59.16	11 33.25	0 28.24		27.40		40.58	
				56 3.84	9 45.28	0 20.12	23.96	45.76					
R. 21 36				56 23.88	0 4.60	0 0.00	23.88	42.32					
				56 21.20	2 7.57	0 0.95	22.15	42.24					
L. 201 36	55 50.26	12 51.43	0 34.79	25.05	40.51								
	55 36.92	15 21.40	0 49.61	26.53	43.41								
					44.89								

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	191 44 38.84
Do. do. do. by Western do.	...	...	...	...	191 44 42.84
Concluded do. do. by both Elongations	...	...	...	...	191 44 40.84
Angle R. M. and XVIII, as on following page...	...	...	...	...	+ 68 20 54.68
Observed Azimuth of XVIII	...	...	...	...	260 5 35.52
Computed do. do. in terms of the initial value adopted at Kalfánpúr, see page 45	...	...	...	...	260 5 35.52
Observed—Computed Azimuth	...	...	...	...	0.00



Observations at XX—(Continued).

At XX											
November 1849, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on R. M.										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 37'	201° 37'	28° 48'	208° 48'	
R.M. & XVIII	<i>h</i> 54° 04'	<i>h</i> 54° 48'	<i>l</i> 53° 64'	<i>l</i> 53° 78'	<i>l</i> 55° 78'	<i>l</i> 53° 94'	<i>l</i> 54° 90'	<i>l</i> 54° 64'	<i>l</i> 55° 74'	<i>l</i> 55° 46'	<i>M</i> = 54° 68' <i>w</i> = 9.90 $\frac{1}{w}$ = 0.10 <i>C</i> = 68° 20' 54" 68
	<i>h</i> 54° 46'	<i>h</i> 54° 38'	<i>l</i> 53° 20'	<i>l</i> 52° 72'	<i>l</i> 55° 90'	<i>l</i> 54° 62'	<i>l</i> 56° 40'	<i>l</i> 53° 98'	<i>l</i> 56° 04'	<i>l</i> 55° 52'	
	54° 25'	54° 43'	53° 42'	53° 25'	55° 84'	54° 28'	55° 65'	54° 31'	55° 89'	55° 49'	

Observations at XXIII,

Lat. N. 24° 25' 7" 27, Long. E. 75° 1' 32" 87 =  $5^h 0^m 6^s \cdot 2^d = 0.208$ , Height above mean sea level 1,532 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1850  1st February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	R. 0 1	+ 8 38 43.76	Level readings insufficient	<i>h m s</i> 0 26 6.33	+ 3 24.76	+ 8 42 8.52	π - 8° 48' 51" 81	"	L. 179° 53' 16" 45 R. 179 53 16 11
				39 18.74		23 51.37	2 50.92	9.66		16.71	
			L. 180 2	41 3.08		14 49.54	1 5.87	8.95		17.85	
				41 17.98		12 46.58	0 48.90	6.88		17.14	
			R. 0 1	42 0.74		4 33.73	0 6.22	6.96		15.07	
				42 6.52		0 13.81	0 0.02	6.54		15.15	
			L. 180 2	41 53.22		7 23.05	0 16.25	9.47		14.73	
				41 41.24		9 26.01	0 26.49	7.73		17.66	
										15.92	

Observations at XXIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1850											
2nd February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	R. 0 1	0 1 "	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	$\pi + 8^{\circ} 48' 51''.63$	<i>"</i>	L. 179° 53' 14''.17 R. 179 53 18.82
			L. 180 2	8 52 10.10		0 26 10.48	- 3 22.85	- 8 55 32.95		18.68	
				52 42.52		23 55.52	2 49.62	32.14		19.49	
			L. 180 2	54 15.06		16 36.65	1 21.96	37.02		14.61	
				54 32.84		14 45.68	1 4.76	37.60		14.03	
			R. 0 1	55 13.94		8 16.79	0 20.42	34.36		17.27	
				55 31.80		0 5.94	0 0.00	31.80		19.83	
			L. 180 2	55 21.32		7 31.92	0 16.97	38.29		13.34	
				55 10.02		9 28.89	0 26.90	36.92		14.71	
2nd February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	L. 189 17	+ 8 38 47.18		0 25 45.22	+ 3 19.25	+ 8 42 6.43		14.96	
				39 14.94		23 38.26	2 47.78	2.72		11.25	
			R. 9 17	40 55.16		15 19.41	1 10.38	5.54		14.07	
				41 16.60		13 7.45	0 51.60	8.20		16.73	
			L. 189 17	41 57.44		5 24.60	0 8.75	6.19		14.72	
				42 4.74		0 1.70	0 0.00	4.74		13.27	
			R. 9 17	41 52.78		7 10.17	0 15.32	8.10		16.63	
				41 43.58		9 4.13	0 24.49	8.07		16.60	
3rd February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	L. 189 17	- 8 51 31.76		0 28 51.06	- 4 6.23	- 8 55 37.99		13.30	
				52 19.14		25 49.11	3 17.40	36.54		14.75	
			R. 9 17	53 51.30		18 37.24	1 42.93	34.23		17.06	
				54 9.12		16 41.27	1 22.72	31.84		19.45	
			L. 189 17	55 8.98		9 56.39	0 29.41	38.39		12.90	
				55 39.74		0 4.57	0 0.00	39.74		11.55	
			R. 9 17	55 17.68	7 29.30	0 16.78	34.46	16.83			
				55 6.34	9 13.26	0 25.45	31.79	19.50			
3rd February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	R. 18 32	+ 8 38 19.38	0 27 41.47	+ 3 50.45	+ 8 42 9.83	18.70			
				39 1.52	25 0.52	3 7.87	9.39	18.26			
			L. 198 33	40 50.86	15 53.67	1 15.73	6.59	15.46			
				41 13.62	13 8.72	0 51.77	5.39	14.26			

Observations at XXIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1850											
3rd February	No. 8199 B.A.C. (opp.) (B.A.C.)	West (contd.)	R. 18 32	+ 8 42 1'10 42 7'98		<i>h m s</i> 0 4 45'86	+ 0 6'79	+ 8 42 7'89 7'98	π - 8° 48' 51" 13	16'76 16'85	R. 179° 53' 17" 64
L. 198 33			41 39'64 41 24'78	9 48'90 11 59'86		0 28'68 0 42'82	8'32 7'60	17'19 16'47			
R. 18 32			- 8 52 19'74 52 45'20	0 25 43'87 23 56'90		- 3 16'07 2 49'95	- 8 55 35'81 35'15	15'14 15'80			
L. 198 33			54 9'98 54 26'58	16 57'01 15 20'04		1 25'33 1 9'88	35'31 36'46	15'64 14'49			
4th February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	R. 18 32	55 13'74	Level readings insufficient	8 43'15	0 22'64	36'38	π + 8° 48' 50" 95	14'57	L. 179° 53' 14" 61 R. 179 53 15 32
L. 198 33			55 35'18 55 22'22 55 12'74	0 1'71 7 0'59 8 56'56		0 0'00 0 14'70 0 23'93	35'18 36'92 36'67	15'77 14'03 14'28			
R. 27 48			+ 8 38 25'70 39 2'62	0 26 56'47 24 43'50		+ 3 38'10 3 3'62	+ 8 42 3'80 6'24	13'00 15'44			
L. 207 49			40 56'90 41 10'40 41 50'94 42 5'30	15 27'65 13 40'68 6 49'79 0 1'10		1 11'65 0 56'05 0 13'95 0 0'00	8'55 6'45 4'89 5'30	17'75 15'65 14'09 14'50			
4th February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	R. 27 48	41 46'10 41 33'74		7 42'98 9 32'95	0 17'74 0 27'15	3'84 0'89	π - 8° 48' 50" 80	13'04 10'09	L. 179° 53' 15" 50 R. 179 53 12 89
L. 207 49			53 49'70 54 6'74 54 58'90	19 7'22 17 23'25 11 15'35		1 48'50 1 29'78 0 37'70	38'20 36'52 36'60	12'42 14'10 14'02			
R. 27 48			- 8 52 0'54 52 28'54	0 27 6'10 25 11'13		- 3 37'41 3 7'87	- 8 55 37'95 36'41	12'67 14'21			
L. 207 49			55 36'68 55 22'68 55 13'00	0 3'48 7 6'37 8 51'35		0 0'00 0 15'11 0 23'47	36'68 37'79 36'47	13'94 12'83 14'15			
5th February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	R. 27 48	55 22'68 55 13'00		7 6'37 8 51'35	0 15'11 0 23'47	37'79 36'47	π + 8° 48' 50" 62	12'83 14'15	L. 179° 53' 13" 62 R. 179 53 13 46
L. 207 49			53 49'70 54 6'74 54 58'90	19 7'22 17 23'25 11 15'35		1 48'50 1 29'78 0 37'70	38'20 36'52 36'60	12'42 14'10 14'02			
R. 27 48			- 8 52 0'54 52 28'54	0 27 6'10 25 11'13		- 3 37'41 3 7'87	- 8 55 37'95 36'41	12'67 14'21			
L. 207 49			55 36'68 55 22'68 55 13'00	0 3'48 7 6'37 8 51'35		0 0'00 0 15'11 0 23'47	36'68 37'79 36'47	13'94 12'83 14'15			

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XXIII—(Continued).

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	179 53 15 <sup>o</sup> 17
Do. do. do. by Western do.	...	...	...	...	179 53 15 <sup>o</sup> 50
Concluded do. do. by both Elongations	...	...	...	...	<u>179 53 15<sup>o</sup>34</u>
Angle R. M. and XXII; see page 44— <sub>B</sub> .	...	...	...	64° 45' 45" 50	
Proportional part of correction to find final value of ditto; see pages 44— <sub>B</sub> , and 45— <sub>B</sub> , and triangle No. 652, page 34— <sub>b</sub>	+	0 <sup>o</sup> 37	+	64 45 45 <sup>o</sup> 87	
Observed Azimuth of XXII	...	...	...	...	244 39 1 <sup>o</sup> 21
Computed do. do. in terms of the initial value } adopted at Kalíánpúr; see page 45— <sub>b</sub>	...	...	...	...	244 38 59 <sup>o</sup> 49
Observed—Computed Azimuth	...	...	...	...	<u><u>1<sup>o</sup>72</u></u>

Observations at XXVIII,

Lat. N. 24° 43' 6" 11, Long. E. 74° 35' 25" 66 = 4<sup>h</sup> 58<sup>m</sup> 21<sup>s</sup> 7 = 0<sup>d</sup> 207, Height above mean sea level 1910 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1850	No. 3528 B.A.C. (opp:) (B.A.C.)	East	R. 0 1	0 1 13 2 48 <sup>o</sup> 98	Level readings insufficient	h m s	' "	0 1 13 2 52 <sup>o</sup> 47	7° 21' 46" 44	"	L. 174° 18' 56" 69
0 3 43 <sup>o</sup> 79				0 3 <sup>o</sup> 49		53 <sup>o</sup> 97					
5 58 <sup>o</sup> 76				0 8 <sup>o</sup> 96		55 <sup>o</sup> 44					
10 30 <sup>o</sup> 69				0 27 <sup>o</sup> 72		57 <sup>o</sup> 22					
11 44 <sup>o</sup> 67				0 34 <sup>o</sup> 61		54 <sup>o</sup> 79					

Observations at XXVIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1850	No. 3528 B.A.C. (opp.) (B.A.C.)	East (contd.)	R. 0 1	0 1 48'30	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	π + 7° 21' 46".44	"	R. 174° 18' 54".82
0 16 4'60			- 1 4'91	- 13 2 53'21		53'23					
L. 180 2			1 33'06	17 28'58		1 16'73	49'79	56'65			
0 49'96			21 59'50	2 1'60		51'56	54'88				
0 35'52			23 10'49	2 15'05		50'57	55'87				
23rd February		West	R. 0 1	+ 1 36 59'60		0 28 56'94	+ 3 30'93	+ 1 40 30'53	44'26		
			L. 180 2	37 25'52		27 5'97	3 4'79	30'31	44'04		
			R. 0 1	38 52'48		19 56'08	1 39'87	32'35	46'08		
			L. 180 2	39 10'16		18 2'11	1 21'72	31'88	45'61		
			R. 0 1	40 0'58		10 32'22	0 27'85	28'43	42'16		
			L. 180 2	40 30'04		0 0'38	0 0'00	30'04	43'77		
23rd February		East	L. 180 2	40 20'50		7 28'51	0 13'96	34'46	48'19		
				40 10'86		9 18'48	0 21'63	32'49	46'22		
			R. 9 16	- 13 2 44'46		0 4 15'78	- 0 4'54	- 13 2 49'00	57'09		
			L. 189 16	2 47'48		0 7'85	0 0'00	47'48	58'61		
			R. 9 16	2 43'80		6 4'06	0 9'23	53'03	53'06		
			L. 189 16	2 37'14		7 38'03	0 14'61	51'75	54'34		
24th February		West	R. 9 16	2 4'94		12 50'95	0 41'44	46'38	59'71		
			L. 189 16	1 56'16		14 11'93	0 50'61	46'77	59'32		
			R. 9 16	1 18'32		19 29'84	1 35'53	53'85	52'24		
			L. 189 16	0 59'12		21 16'82	1 53'83	52'95	53'14		
			R. 9 16	+ 1 37 39'40		0 26 7'80	+ 2 51'77	+ 1 40 31'17	45'26		
			L. 189 17	38 8'10		23 42'83	2 21'41	29'51	43'60		
24th February	East	R. 9 16	39 29'02	15 54'95	1 3'61	32'63	46'72				
		L. 189 17	39 42'74	13 58'98	0 49'09	31'83	45'92				
		R. 9 16	40 23'14	6 42'09	0 11'26	34'40	48'49				
		L. 189 17	40 28'82	0 0'81	0 0'00	28'82	42'91				
		R. 9 16	40 14'46	8 33'68	0 18'31	32'77	46'86				
		L. 189 17	40 4'04	10 23'65	0 26'97	31'01	45'10				

Observations at XXVIII—(Continued).

Astronomical Date	Star's name and Catalogus employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
						<i>h m s</i>	<i>' "</i>	<i>° ' "</i>		<i>"</i>			
1850	25th February No. 3528 B.A.C. (opp.) (B.A.C.)	East	L. 198 33	-13 2 52.14	Level readings insufficient	0 0 0.19	- 0 0.00	- 13 2 52.14	$\pi + 7^{\circ} 21' 45''.74$	53.60	L. 174° 18' 53''.56 R. 174 18 57.73		
			R. 18 32	2 49.20		2 44.15	0 1.87	51.07		54.67			
			L. 198 33	2 15.22		11 6.02	0 30.91	46.13		59.61			
		R. 18 32	2 6.88	12 36.00		0 39.84	46.72	59.02					
		L. 198 33	1 32.36	0 17 53.92		1 20.48	52.84	52.90					
		R. 18 32	1 15.00	19 42.89		1 37.67	52.67	53.07					
	25th February No. 3528 B.A.C. (opp.) (B.A.C.)	West	R. 18 32	12 59 57.52		26 12.79	2 52.87	50.39		55.35	$\pi - 7^{\circ} 21' 45''.56$	55.35	L. 174° 18' 45''.75 R. 174 18 47.08
			L. 198 33	59 35.98		27 40.77	3 12.80	48.78		56.96			
			R. 18 32	+ 1 37 42.50		0 26 3.53	+ 2 50.83	+ 1 40 33.33		47.77			
		L. 198 33	38 10.06	23 51.56		2 23.15	33.21	47.65					
		R. 18 32	39 20.48	16 46.68		1 10.70	31.18	45.62					
		L. 198 33	39 33.80	15 2.70		0 56.84	30.64	45.08					
26th February No. 3528 B.A.C. (opp.) (B.A.C.)	East	R. 18 32	40 12.46	8 31.81	0 18.25	30.71	45.15	$\pi - 7^{\circ} 21' 45''.38$	45.15	L. 174° 18' 50''.84 R. 174 18 55.26			
		L. 198 33	40 33.32	0 0.06	0 0.00	33.32	47.76						
		R. 27 48	40 23.70	6 8.96	0 9.45	33.15	47.59						
	L. 207 48	40 14.84	7 51.94	0 15.45	30.29	44.73							
	R. 27 48	-13 2 51.46	0 1 38.38	- 0 0.67	- 13 2 52.13	53.25							
	L. 207 48	2 31.90	8 39.27	0 18.78	50.68	54.70							
26th February No. 3528 B.A.C. (opp.) (B.A.C.)	West	R. 27 48	2 16.96	12 28.21	0 39.02	55.98	49.40	$\pi + 7^{\circ} 21' 45''.21$	49.40	L. 174° 18' 42''.72			
		L. 207 48	1 54.82	15 21.16	0 59.18	54.00	51.38						
		R. 27 48	1 4.80	20 28.08	1 45.29	50.09	55.29						
	L. 207 48	0 47.00	21 54.06	2 0.58	47.58	57.80							
	R. 27 48	12 59 58.52	26 25.99	2 55.79	54.31	51.07							
	L. 207 48	59 41.98	27 36.97	3 11.91	53.89	51.49							
26th February No. 3528 B.A.C. (opp.) (B.A.C.)	East	R. 27 48	+ 1 37 47.00	0 25 23.27	+ 2 42.13	+ 1 40 29.13	43.92	$\pi - 7^{\circ} 21' 45''.21$	43.92	L. 174° 18' 42''.72			
		L. 207 48	38 5.28	23 42.29	2 21.30	26.58	41.37						
		R. 27 48	39 25.10	15 44.41	1 2.21	27.31	42.10						
	L. 207 48	39 38.28	14 25.43	0 52.23	30.51	45.30							
	R. 27 48												
	L. 207 48												

Observations at XXVIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1850 26th February	No. 3528 B.A.C. (opp.) (B.A.C.)	West (contd.)	L. 207 48 R. 27 48	° ' " + 1 40 13.06 40 26.20 40 16.54 40 9.88	Level readings insufficient	<i>h m s</i> 0 8 10.53 0 0.35 7 3.24 8 42.22	<i>' "</i> + 0 16.76 0 0.00 0 12.43 0 18.92	° ' " + 1 40 29.82 26.20 28.97 28.80	π - 7° 21' 45".21	" 44.61 40.99 43.76 43.59	R. 174° 18' 43".69

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	174	18	54.97
Do. do. do. by Western do.	...	...	...	...	174	18	45.07
Concluded do. do. by both Elongations	...	...	...	...	174	18	50.02
Angle R. M. and XXVI, as below	...	...	...	...	110	17	17.49
Observed Azimuth of XXVI	...	...	...	...	284	36	7.51
Computed do. do. in terms of the initial value adopted at Kalfánpúr; see page 46 <sub>b</sub>	...	...	...	...	284	36	4.61
Observed - Computed Azimuth	...	...	...	...	...	...	2.90

At XXVIII

February 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on R. M.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0°1'	180°1'	7°12'	187°13'	14°24'	194°25'	21°36'	201°36'	28°48'	208°48'	
R. M. & XXVI	"	"	"	"	"	"	"	"	"	"	M = 17".49
	<i>h</i> 17.82	<i>h</i> 17.16	<i>l</i> 17.30	<i>l</i> 15.96	<i>l</i> 18.26	<i>l</i> 18.54	<i>h</i> 17.84	<i>h</i> 17.96	<i>l</i> 17.60	<i>h</i> 17.82	w = 19.36
	<i>h</i> 17.68	<i>h</i> 15.70	<i>l</i> 18.02	<i>h</i> 16.70	<i>l</i> 18.36	<i>l</i> 18.16	<i>h</i> 17.56	<i>h</i> 17.54	<i>h</i> 17.92	<i>h</i> 16.88	$\frac{1}{w} = 0.05$
	<i>d</i> 17.19								<i>d</i> 16.99		C = 110° 17' 17".49
	17.56	16.43	17.66	16.33	18.31	18.35	17.70	17.75	17.50	17.35	

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XXXIII,

Lat. N.  $24^{\circ} 55' 38'' \cdot 24$ , Long. E.  $73^{\circ} 53' 11'' \cdot 59 = 4\ 55\ 32 \cdot 8 = 0 \cdot 205$ , Height above mean sea level 2369 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1851	No. 2326 B.A.C. (opp.) (B.A.C.)	East	R. 0 1	+ 29 10 39 <sup>o</sup> 46 <sup>i</sup>	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>o ' "</i>	$\pi + 8^{\circ} 4' 37'' \cdot 97$	"	L. 217 <sup>o</sup> 12' 33 <sup>o</sup> 24 R. 217 12 29 60	
						0 24 51 <sup>o</sup> 3 <sup>i</sup>	- 2 48 <sup>o</sup> 12 <sup>i</sup>	+ 29 7 51 <sup>o</sup> 34 <sup>i</sup>				29 <sup>o</sup> 31 <sup>i</sup>
			L. 180 1	9 45 <sup>o</sup> 36 <sup>i</sup>		20 25 <sup>o</sup> 3 <sup>i</sup>	1 53 <sup>o</sup> 66 <sup>i</sup>	51 <sup>o</sup> 70 <sup>i</sup>				29 <sup>o</sup> 67 <sup>i</sup>
				8 54 <sup>o</sup> 78 <sup>i</sup>		14 45 <sup>o</sup> 4 <sup>i</sup>	0 59 <sup>o</sup> 46 <sup>i</sup>	55 <sup>o</sup> 32 <sup>i</sup>				33 <sup>o</sup> 29 <sup>i</sup>
			R. 0 1	8 41 <sup>o</sup> 58 <sup>i</sup>		13 2 <sup>o</sup> 4 <sup>i</sup>	0 46 <sup>o</sup> 44 <sup>i</sup>	55 <sup>o</sup> 14 <sup>i</sup>				33 <sup>o</sup> 11 <sup>i</sup>
				8 6 <sup>o</sup> 22 <sup>i</sup>		7 26 <sup>o</sup> 5 <sup>i</sup>	0 15 <sup>o</sup> 15 <sup>i</sup>	51 <sup>o</sup> 07 <sup>i</sup>				29 <sup>o</sup> 04 <sup>i</sup>
		West	L. 180 1	7 52 <sup>o</sup> 40 <sup>i</sup>		0 0 <sup>o</sup> 6 <sup>i</sup>	0 0 <sup>o</sup> 00 <sup>i</sup>	52 <sup>o</sup> 40 <sup>i</sup>		30 <sup>o</sup> 37 <sup>i</sup>		
				8 10 <sup>o</sup> 56 <sup>i</sup>		7 17 <sup>o</sup> 3 <sup>i</sup>	0 14 <sup>o</sup> 59 <sup>i</sup>	55 <sup>o</sup> 97 <sup>i</sup>		33 <sup>o</sup> 94 <sup>i</sup>		
			R. 0 1	8 17 <sup>o</sup> 60 <sup>i</sup>		9 8 <sup>o</sup> 3 <sup>i</sup>	0 22 <sup>o</sup> 95 <sup>i</sup>	54 <sup>o</sup> 65 <sup>i</sup>		32 <sup>o</sup> 62 <sup>i</sup>		
			L. 180 1	+ 45 13 57 <sup>o</sup> 68 <sup>i</sup>		0 26 23 <sup>o</sup> 7 <sup>i</sup>	+ 3 12 <sup>o</sup> 12 <sup>i</sup>	+ 45 17 9 <sup>o</sup> 80 <sup>i</sup>		31 <sup>o</sup> 99 <sup>i</sup>		
				14 25 <sup>o</sup> 34 <sup>i</sup>		24 28 <sup>o</sup> 7 <sup>i</sup>	2 45 <sup>o</sup> 19 <sup>i</sup>	10 <sup>o</sup> 53 <sup>i</sup>		32 <sup>o</sup> 72 <sup>i</sup>		
			R. 0 1	15 41 <sup>o</sup> 60 <sup>i</sup>		18 28 <sup>o</sup> 8 <sup>i</sup>	1 34 <sup>o</sup> 02 <sup>i</sup>	15 <sup>o</sup> 62 <sup>i</sup>		37 <sup>o</sup> 81 <sup>i</sup>		
		East	L. 180 1	15 57 <sup>o</sup> 14 <sup>i</sup>		16 42 <sup>o</sup> 8 <sup>i</sup>	1 16 <sup>o</sup> 88 <sup>i</sup>	14 <sup>o</sup> 02 <sup>i</sup>		36 <sup>o</sup> 21 <sup>i</sup>		
				16 40 <sup>o</sup> 16 <sup>i</sup>		10 5 <sup>o</sup> 9 <sup>i</sup>	0 28 <sup>o</sup> 03 <sup>i</sup>	8 <sup>o</sup> 19 <sup>i</sup>		30 <sup>o</sup> 38 <sup>i</sup>		
			R. 0 1	17 11 <sup>o</sup> 28 <sup>i</sup>		0 2 <sup>o</sup> 0 <sup>i</sup>	0 0 <sup>o</sup> 00 <sup>i</sup>	11 <sup>o</sup> 28 <sup>i</sup>		33 <sup>o</sup> 47 <sup>i</sup>		
			L. 180 1	17 5 <sup>o</sup> 88 <sup>i</sup>		6 13 <sup>o</sup> 9 <sup>i</sup>	0 10 <sup>o</sup> 63 <sup>i</sup>	16 <sup>o</sup> 51 <sup>i</sup>		38 <sup>o</sup> 70 <sup>i</sup>		
				16 55 <sup>o</sup> 78 <sup>i</sup>		8 2 <sup>o</sup> 9 <sup>i</sup>	0 17 <sup>o</sup> 72 <sup>i</sup>	13 <sup>o</sup> 50 <sup>i</sup>		35 <sup>o</sup> 69 <sup>i</sup>		
			R. 0 1	+ 29 11 4 <sup>o</sup> 14 <sup>i</sup>		0 26 24 <sup>o</sup> 7 <sup>i</sup>	- 3 9 <sup>o</sup> 75 <sup>i</sup>	+ 29 7 54 <sup>o</sup> 39 <sup>i</sup>		32 <sup>o</sup> 02 <sup>i</sup>		
West	L. 189 16	10 39 <sup>o</sup> 86 <sup>i</sup>	24 43 <sup>o</sup> 7 <sup>i</sup>	2 46 <sup>o</sup> 41 <sup>i</sup>	53 <sup>o</sup> 45 <sup>i</sup>	31 <sup>o</sup> 08 <sup>i</sup>						
		9 23 <sup>o</sup> 62 <sup>i</sup>	18 13 <sup>o</sup> 8 <sup>i</sup>	1 30 <sup>o</sup> 64 <sup>i</sup>	52 <sup>o</sup> 98 <sup>i</sup>	30 <sup>o</sup> 61 <sup>i</sup>						
	R. 9 16	9 7 <sup>o</sup> 92 <sup>i</sup>	16 39 <sup>o</sup> 8 <sup>i</sup>	1 15 <sup>o</sup> 77 <sup>i</sup>	52 <sup>o</sup> 15 <sup>i</sup>	29 <sup>o</sup> 78 <sup>i</sup>						
	L. 189 16	8 22 <sup>o</sup> 96 <sup>i</sup>	9 56 <sup>o</sup> 9 <sup>i</sup>	0 27 <sup>o</sup> 06 <sup>i</sup>	55 <sup>o</sup> 90 <sup>i</sup>	33 <sup>o</sup> 53 <sup>i</sup>						
		7 53 <sup>o</sup> 82 <sup>i</sup>	0 0 <sup>o</sup> 0 <sup>i</sup>	0 0 <sup>o</sup> 00 <sup>i</sup>	53 <sup>o</sup> 82 <sup>i</sup>	31 <sup>o</sup> 45 <sup>i</sup>						
	R. 9 16	8 3 <sup>o</sup> 50 <sup>i</sup>	6 25 <sup>o</sup> 9 <sup>i</sup>	0 11 <sup>o</sup> 36 <sup>i</sup>	52 <sup>o</sup> 14 <sup>i</sup>	29 <sup>o</sup> 77 <sup>i</sup>						
	8 11 <sup>o</sup> 36 <sup>i</sup>	8 23 <sup>o</sup> 9 <sup>i</sup>	0 19 <sup>o</sup> 38 <sup>i</sup>	51 <sup>o</sup> 98 <sup>i</sup>	29 <sup>o</sup> 61 <sup>i</sup>							



Observations at XXXIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
												h	m	s
1851														
2nd January	No. 2326 B.A.C. (opp.) (B.A.C.)	West	L. 189 16	+ 45 13 41.52 14 15.80	Level readings insufficient	0 27 35.8	+ 3 30.06	+45 17 11.58	π - 8° 4' 37".47	34.11	L. 217° 12' 35".21 R. 217 12 32.57			
			R. 9 16	15 45.12 16 6.04		25 10.8	2 54.79	10.59		33.12				
			L. 189 16	16 56.74 17 11.82		17 31.9	1 24.62	9.74		32.27				
			R. 9 16	16 29.98 16 15.36		15 19.9	1 4.69	10.73		33.26				
						8 32.0	0 20.00	16.74		39.27				
						0 1.1	0 0.00	11.82		34.35				
		3rd January	No. 2326 B.A.C. (opp.) (B.A.C.)	East		R. 18 32	+ 29 11 29.38 11 1.84	0 28 15.4		- 3 37.04		+ 29 7 52.34	π + 8° 4' 37".29	29.63
						L. 198 32	9 44.52 9 25.90	26 21.4		3 8.95		52.89		30.18
						R. 18 32	8 31.64	19 50.5		1 47.31		57.21		34.50
								17 54.5		1 27.47		58.43		35.72
								11 43.5		0 37.57		54.07		31.36
								0 1.3		0 0.00		53.80		31.09
3rd January	No. 2326 B.A.C. (opp.) (B.A.C.)	West	R. 18 32	+ 45 13 36.16 14 7.22	0 27 38.0	+ 3 30.60	+45 17 6.76	π - 8° 4' 37".12	29.64					
			L. 198 32	15 32.92 15 50.20	25 37.0	3 0.93	8.15		31.03					
			R. 18 32	16 41.14 17 11.54	19 8.1	1 40.82	13.74		36.62					
					17 13.1	1 21.62	11.82		34.70					
					10 19.2	0 29.27	10.41		33.29					
					0 0.3	0 0.00	11.54		34.42					
		4th January	No. 2326 B.A.C. (opp.) (B.A.C.)	East	L. 198 32	16 57.70 16 47.14	7 42.6	0 16.27	13.97	π + 8° 4' 36".95	36.85			
							9 39.6	0 25.51	12.65		35.53			
					L. 207 48	+ 29 10 14.70 9 56.06	0 22 37.0	- 2 19.30	+ 29 7 55.40		32.35			
					R. 27 48	9 6.42 8 54.84	21 10.0	2 2.06	54.00		30.95			
							16 17.0	1 12.36	54.06		31.01			
							14 51.1	1 0.22	54.62		31.57			

Observations at XXXIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1851 4th January	No. 2326 B.A.C. (opp.) (B.A.C.)	East (contd.)	L. 207 48	+29 8 22.56	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	π + 8° 4' 36".95	"	R. 217° 12' 31".15			
						0 9 32.1	- 0 24.86	+29 7 57.70				34.65		
								0 1.8				0 0.00	54.68	31.63
			R. 27 48	8 4.10		5 59.7	0 9.87	54.23				31.18		
				8 11.80		8 4.7	0 17.93	53.87				30.82		
	No. 2326 B.A.C. (opp.) (B.A.C.)	West	L. 207 48	+45 14 4.12		0 26 7.3	+ 3 8.15	+45 17 12.27	π - 8° 4' 36".78	"	L. 217° 12' 35".13 R. 217 12 30.98			
				14 24.70		24 34.3	2 46.45	11.15				35.49		
			R. 27 48	15 32.96		18 36.4	1 35.32	8.28				34.37		
				15 49.98		16 57.4	1 19.14	9.12				31.50		
			L. 207 48	16 41.32		10 45.5	0 31.82	13.14				32.34		
				17 11.10		0 0.6	0 0.00	11.10				36.36		

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	217 12 31.72
Do. do. do. by Western do.	...	...	...	...	217 12 33.89
Concluded do. do. by both Elongations	...	...	...	...	217 12 32.81
Angle XXXVI and R. M., as on next page	...	...	...	...	- 111 8 6.01
Observed Azimuth of XXXVI	...	...	...	...	106 4 26.80
Computed do. do. in terms of the initial value adopted at Kalfánpúr; see page 46	...	...	...	...	106 4 24.19
Observed—Computed Azimuth	...	...	...	...	+ 2.61

Observations at XXXIII—(Continued).

At XXXIII

January 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on XXXVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	248° 53'	68° 53'	256° 4'	76° 4'	263° 16'	83° 16'	270° 28'	90° 28'	277° 40'	97° 40'	
XXXVI & R. M.	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 6".01 <i>w</i> = 6.60 $\frac{1}{w}$ = 0.15 <i>C</i> = 111° 8' 6".01
	l 5.14	l 6.46	h 6.44	h 9.54	h 6.46	h 6.72	h 4.98	h 5.70	l 5.82	l 5.44	
	l 5.16	l 6.40	h 6.24	h 8.26	h 6.12	h 5.36	h 4.48	h 4.18	l 6.30	l 4.98	
	5.15	6.43	6.34	8.90	6.29	6.04	4.73	4.94	6.06	5.21	

Observations at XXXVIII,

Lat. N. 24° 58' 28".78, Long. E. 73° 21' 27".13 =  $4^{\text{h}} 53^{\text{m}} 25.8^{\text{s}} = 0.204$ , Height above mean sea level 3607 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
11th December 1850	No. 1879 B.A.C. (opp.) (B.A.C.)	East	R. 0 1 L. 180 1	0 1 "	Level readings insufficient	<i>h m s</i>	<i>' "</i>	0 1 "	π + 3° 34' 47".12	"	L. 194° 51' 31".07
				+11 18 7.42		0 27 30.47	- 1 32.25	+ 11 16 35.17		22.29	
				17 53.22		25 12.49	1 17.50	35.72		22.84	
				17 25.28		18 27.58	0 41.61	43.67		30.79	
				17 15.74		16 5.60	0 31.64	44.10		31.22	

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XXXVIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1850 11th December	No. 1879 B.A.C. (opp.) (B.A.C.)	East (contd.)	R. 0 1	+ 11 16 50.56	Level readings insufficient	<i>h m s</i> 0 10 24.67	<i>' "</i> - 0 13.25	+ 11 16 37.31	$\pi + 3^{\circ} 34' 47''.12$	"	24.43
			L. 180 1	16 38.52		0 7.20	0 0.00	38.52		25.64	
				16 51.52		7 28.11	0 6.84	44.68		31.80	
12th December	No. 1879 B.A.C. (opp.) (B.A.C.)	East	L. 189 16	+ 11 18 26.88	0 29 23.11	- 1 45.23	+ 11 16 41.65	$\pi + 3^{\circ} 34' 46''.76$	28.41	L. 194° 51' 28''.58 R. 194 51 25.47	
				18 10.88	27 14.14	1 30.43	40.45		27.21		
			R. 9 16	17 32.46	21 4.21	0 54.19	38.27		25.03		
		L. 189 16	17 22.68	19 7.24	0 44.64	38.04	24.80				
			16 53.54	9 30.35	0 11.05	42.49	29.25				
		R. 9 16	16 42.70	0 8.53	0 0.00	42.70	29.46				
12th December	No. 1879 B.A.C. (opp.) (B.A.C.)	West	R. 9 16	16 44.76	6 8.45	0 4.62	40.14	$\pi + 3^{\circ} 34' 46''.58$	26.90	L. 194° 51' 30''.36 R. 194 51 23.99	
				16 46.16	7 57.43	0 7.76	38.40		25.16		
			R. 9 16	+ 18 25 4.42	0 23 23.20	+ 1 7.09	+ 18 26 11.51		24.93		
			25 13.60	22 2.22	0 59.56	13.16	26.58				
		L. 189 16	25 39.00	18 5.27	0 40.12	19.12	32.54				
		R. 9 16	25 42.10	16 51.28	0 34.83	16.93	30.35				
13th December	No. 1879 B.A.C. (opp.) (B.A.C.)	East	R. 18 32	25 49.52	12 52.33	0 20.31	9.83	$\pi - 3^{\circ} 34' 46''.39$	23.25	L. 194° 51' 29''.95 R. 194 51 24.55	
				25 51.30	11 35.35	0 16.46	7.76		21.18		
			L. 189 16	26 9.36	7 35.40	0 7.06	16.42		29.84		
			26 15.30	0 0.50	0 0.00	15.30	28.72				
		R. 18 32	+ 11 18 19.06	0 28 52.21	- 1 41.58	+ 11 16 37.48	23.87				
			18 6.86	27 3.23	1 29.23	37.63	24.02				
L. 198 32	17 38.38	21 12.30	0 54.88	43.50	29.89						
R. 18 32	17 28.32	19 38.32	0 47.09	41.23	27.62						
	17 1.58	13 44.40	0 23.07	38.51	24.90						
			0 0.43	0 0.00	39.02	25.41					
			16 39.02	5 48.36	0 4.13	46.57	32.96				
			L. 198 32	16 50.70	7 30.34	0 6.90	42.94	29.33			
				16 49.84							

Observations at XXXVIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1850											
13th December	No. 1879 B.A.C. (opp.) (B.A.C.)	West	L. 198 32 R. 18 32 L. 198 32 R. 18 32	+ 18 25 19'42 25 25'34 25 39'48 25 43'46 26 3'26 26 3'58 26 7'80 26 10'02		<i>h m s</i> 0 20 39'93 19 40'94 15 54'99 14 54'00 11 8'04 9 53'06 5 15'12 0 0'82	<i>' "</i> + 0 52'38 0 47'51 0 31'06 0 27'22 0 15'20 0 11'97 0 3'38 0 0'00	<i>° ' "</i> + 18 26 11'80 12'85 10'54 10'68 18'46 15'55 11'18 10'02	$\pi - 3^{\circ} 34' 46''.22$	" 25'58 26'63 24'32 24'46 32'24 29'33 24'96 23'80	L. 194° 51' 28".45 R. 194 51 24 '39
14th December	No. 1879 B.A.C. (opp.) (B.A.C.)	East	L. 207 47 R. 27 47 L. 207 47 R. 27 47	+ 11 17 58'96 17 50'48 17 16'94 17 4'56 16 55'00 16 42'80 16 45'50 16 48'24	Level readings insufficient	<i>h m s</i> 0 25 24'89 23 44'91 17 50'99 14 43'02 9 11'09 0 0'80 7 22'71 9 8'69	<i>' "</i> - 1 18'77 1 8'80 0 38'91 0 26'46 0 10'32 0 0'00 0 6'67 0 10'25	<i>° ' "</i> + 11 16 40'19 41'68 38'03 38'10 44'68 42'80 38'83 37'99	$\pi + 3^{\circ} 34' 46''.03$	" 26'22 27'71 24'06 24'13 30'71 28'83 24'86 24'02	L. 194° 51' 28".37 R. 194 51 24 '27
14th December	No. 1879 B.A.C. (opp.) (B.A.C.)	West	L. 207 47 R. 27 47 L. 207 47 R. 27 47	+ 18 25 29'10 25 34'52 25 47'42 25 50'86 26 9'26 26 13'32 26 5'34 26 4'22		<i>h m s</i> 0 19 23'12 17 49'14 13 5'20 11 55'21 6 31'28 0 1'36 4 29'58 5 49'57	<i>' "</i> + 0 46'09 0 38'93 0 20'99 0 17'42 0 5'21 0 0'00 0 2'47 0 4'15	<i>° ' "</i> + 18 26 15'19 13'45 8'41 8'28 14'47 13'32 7'81 8'37	$\pi - 3^{\circ} 34' 45''.85$	" 29'34 27'60 22'56 22'43 28'62 27'47 21'96 22'52	L. 194° 51' 28".26 R. 194 51 22 '37
15th December	No. 1879 B.A.C. (opp.) (B.A.C.)	West	R. 0 1 L. 180 1	+ 18 25 35'40 25 43'18 26 3'24 26 6'28		<i>h m s</i> 0 17 27'31 15 17'34 11 4'39 9 47'40	<i>' "</i> + 0 37'36 0 28'66 0 15'03 0 11'75	<i>° ' "</i> + 18 26 12'76 11'84 18'27 18'03	$\pi - 3^{\circ} 34' 45''.49$	" 27'27 26'35 32'78 32'54	L. 194° 51' 31".25

Observations at XXXVIII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
15th December 1850	No. 1879 B.A.C. (opp: (B.A.C.))	West (contd.)	R. 0 1	0' 12"	Level readings insufficient	h m s	' "	0' 41"	π - 3° 34' 45".49	"	R. 194° 51' 25".15	
				+18 26 6.12		0 4 19.47	+ 0 2.29	+18 26 8.41				22.92
				26 9.54		0 0.52	0 0.00	9.54				24.05
			L. 180 1	26 11.12		6 10.41	0 4.66	15.78				30.29
			26 7.30	7 52.39	0 7.58	14.88			29.39			

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	...	194 51 27.01
Do. do. do. by Western do.	...	...	...	...	...	194 51 26.78
Concluded do. do. by both Elongations	...	...	...	...	...	194 51 26.90
Angle R. M. and XXXVI, as below	...	...	...	...	...	+ 71 53 48.86
Observed Azimuth of XXXVI	...	...	...	...	...	266 45 15.76
Computed do. do. in terms of the initial value } adopted at Kaliánpúr; see page 47— <sub>b</sub>	...	...	...	...	...	266 45 19.93
Observed—Computed Azimuth	...	...	...	...	...	4.17

At XXXVIII

December 1850, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on R.M.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	288° 7'	108° 7'	295° 19'	115° 18'	302° 30'	122° 30'	309° 42'	129° 42'	316° 54'	136° 54'	
R.M. & XXXVI	"	"	"	"	"	"	"	"	"	"	M = 48".86
	h 50.20	h 49.54	h 48.96	h 49.14	h 48.76	h 48.68	h 47.06	h 48.18	h 48.22	h 48.80	w = 9.30
	h 51.22	h 49.42	h 49.08	h 50.12	h 49.14	h 49.12	h 47.62	h 46.82	h 49.34	h 47.82	I = 0.12 w
	50.71	49.48	49.02	49.63	48.95	48.90	47.34	47.50	48.78	48.31	C = 71° 53' 48".86

Observations at XLII,

Lat. N.  $24^{\circ} 38' 58'' \cdot 39$ , Long. E.  $72^{\circ} 49' 6'' \cdot 91 = 4^{\text{h}} 51^{\text{m}} 16^{\text{s}} \cdot 5 = 0^{\text{d}} \cdot 202$ , Height above mean sea level 5650 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.																																																																																																																																																																																					
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Observations at XLII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1850	7th November	West	No. 960 B.A.C. (opp:) (B.A.C.)	L. 189 17	+38 46 32.94	Level readings insufficient	h m s	' "	' "	$\pi - 6^{\circ} 11' 59''.05$	"	L. 212° 37' 15''.11 R. 212 37 16 .23	
					46 55.86		o 27 35.00	+ 2 41.42	+ 38 49 14.36				15.31
				R. 9 17	48 0.90		25 30.02	2 17.92	13.78				14.73
					48 22.98		18 30.12	1 12.54	13.44				14.39
				L. 189 17	49 3.10		15 43.16	o 52.34	15.32				16.27
					49 13.80		7 24.27	o 11.60	14.70				15.65
	8th November	East	No. 960 B.A.C. (opp:) (B.A.C.)	R. 9 17	49 2.22		o 1.37	o 0.00	13.80	14.75	$\pi + 6^{\circ} 11' 58''.86$	"	L. 212° 37' 9''.66 R. 212 37 14 .16
					48 54.96		7 57.52	o 13.36	15.58	16.53			
				R. 18 32	+26 27 0.92		20 30.60	1 28.45	17.11	15.97			
					26 45.56		14 4.69	o 41.74	11.24	10.10			
				L. 198 32	25 52.98		12 23.71	o 32.37	10.77	9.63			
					25 43.14		7 1.78	o 10.42	15.48	14.34			
8th November	West	No. 960 B.A.C. (opp:) (B.A.C.)	R. 18 32	25 25.90	o 3.87	o 0.00	13.86	12.72	$\pi - 6^{\circ} 11' 58''.66$	"	L. 212° 37' 16''.01 R. 212 37 16 .56		
				25 13.86	6 30.04	o 8.94	10.70	9.56					
			L. 198 32	25 19.64	8 22.02	o 14.81	10.47	9.33					
				25 25.28	o 26 31.86	+ 2 29.31	+ 38 49 14.95	16.29					
			R. 18 32	+38 46 45.64	24 17.90	2 5.21	15.29	16.63					
				47 10.08	17 11.99	1 2.68	15.44	16.78					
8th November	East	No. 960 B.A.C. (opp:) (B.A.C.)	L. 198 32	48 12.76	15 6.02	o 48.29	13.37	14.71	$\pi + 6^{\circ} 11' 58''.46$	"	L. 212° 37' 10''.52		
				48 25.08	7 16.13	o 11.18	14.76	16.10					
			R. 18 32	49 3.58	o 1.23	o 0.00	15.88	17.22					
				49 15.88	7 19.67	o 11.33	15.93	17.27					
			L. 198 32	49 4.60	9 14.64	o 18.02	13.92	15.26					
				48 55.90	o 24 54.52	- 2 10.30	+ 26 25 12.74	11.20					
9th November	East	No. 960 B.A.C. (opp:) (B.A.C.)	R. 27 49	26 8.96	22 6.56	1 42.73	10.63	9.09	"	L. 212° 37' 10''.52			
				26 53.36	16 8.64	o 54.86	14.10	12.56					
			L. 207 49	+26 27 23.04	13 52.67	o 40.56	11.62	10.08					
				26 52.18									
			R. 27 49	26 8.96									
				25 52.18									





Observations at XLVI,

Lat. N. 24° 26' 38".64, Long. E. 72° 15' 31".69 = <sup>h m s d</sup>4 49 2.1 = 0.201, Height above mean sea level 673 feet,  
observed by Captain A. Strange and Mr. C. Lane

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope  
being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1851 4th November	No. 960 B.A.C. (opp.) (B.A.C.)	East	R. 0 1	+ 4 22 14.18	Level readings insufficient	<sup>h m s</sup> 0 27 57.74	<sup>' "</sup> - 2 43.70	<sup>o ' "</sup> + 4 19 30.48	$\pi + 6^{\circ} 11' 7.04$	"	L. 190° 30' 35".64 R. 190 30 36.67			
				21 53.62		26 5.76	2 22.64	30.98		37.52				
			L. 180 1	20 58.44		20 32.83	1 28.56	29.88		38.02				
				20 45.46		18 45.85	1 13.89	31.57		38.61				
			R. 0 1	20 8.94		13 35.91	0 38.86	30.08		37.12				
				19 27.00		0 21.91	0 0.03	26.97		34.01				
	L. 180 1	19 36.00	6 5.84	0 7.84		28.16	35.20							
		19 37.14	7 38.82	0 12.34		24.80	31.84							
	4th November	No. 960 B.A.C. (opp.) (B.A.C.)	West	R. 0 1		+ 16 39 8.82	<sup>h m s</sup> 0 27 7.63	<sup>' "</sup> + 2 35.74		<sup>o ' "</sup> + 16 41 44.56		$\pi - 6^{\circ} 11' 6.84$	"	L. 190° 30' 42".93* R. 190 30 40.50*
						39 28.42	25 18.65	2 15.55		43.97			37.72	
				L. 180 1		40 28.58	19 33.72	1 25.91		49.49			37.13	
						40 40.66	17 55.74	1 7.95		48.61			42.65	
R. 0 1				41 11.94	12 50.81	0 34.86	46.80	41.77						
				41 50.38	0 0.04	0 0.00	50.38	39.96						
5th November	No. 960 B.A.C. (opp.) (B.A.C.)	East	L. 189 16	+ 4 21 27.52	<sup>h m s</sup> 0 23 47.83	<sup>' "</sup> - 1 58.69	<sup>o ' "</sup> + 4 19 28.83	$\pi + 6^{\circ} 11' 6.65$	"	L. 190° 30' 34".26 R. 190 30 37.56				
				21 11.18	22 20.85	1 44.71	26.47		35.48					
			R. 9 16	20 29.60	16 29.92	0 57.16	32.44		33.12					
				20 19.36	14 57.94	0 47.05	32.31		39.09					
			L. 189 16	19 50.16	9 42.00	0 19.79	30.37		38.96					
				19 24.78	0 19.87	0 0.02	24.76		37.02					
	19 35.92	5 36.81	0 6.65	29.27	31.41									
	19 40.34	7 7.79	0 10.73	29.61	35.92									
						36.26								

NOTE—The observations on the 4th, 5th and 6th were made by Captain Strange and those on the 7th and 8th by Mr. Lane.  
\* For the remaining observations on these Zeros, see 8th November.

Observations at XLVI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1851														
5th November	No. 960 B.A.C. (opp.) (B.A.C.)	West	R. 9 16	+ 16 39 30.98 39 49.42	Level readings insufficient	h m s	' "	o ' "	π - 6° 11' 6".45	39.90 40.06 42.70 37.76 45.23 39.55	L. 190° 30' 41".31 R. 190 30 39.68			
L. 189 16	40 40.06 40 46.94 41 45.38 41 46.00	o 25 17.62 23 31.64 18 4.71 16 27.73 5 27.87 o 0.93	+ 2 15.37 1 57.09 1 9.09 o 57.27 o 6.30 o 0.00	+ 16 41 46.35 46.51 49.15 44.21 51.68 46.00										
R. 9 16	41 41.38 41 37.26	4 47.01 6 13.99	o 4.82 o 8.18	46.20 45.44										
6th November	No. 960 B.A.C. (opp.) (B.A.C.)	East	R. 18 32	+ 4 21 26.62 21 11.06		o 23 38.36 21 38.39	- 1 57.12 1 38.20	+ 4 19 29.50 32.86				π + 6° 11' 6".24	35.74 39.10 39.01 37.87 37.80 37.46	L. 190° 30' 36".04 R. 190 30 37.53
L. 198 32	20 30.22 20 18.52	14 56.47 9 24.54	o 57.45 o 46.89	32.77 31.63										
R. 18 32	19 50.18 19 31.22	o 18.62 o 0.35	31.56 31.22											
L. 198 32	19 35.96 19 36.84	5 42.28 7 15.26	o 6.87 o 11.11	29.09 25.73										
6th November	No. 960 B.A.C. (opp.) (B.A.C.)	West	R. 18 32	+ 16 39 13.20 39 31.14		o 26 46.38 25 0.41	+ 2 31.69 2 12.31	+ 16 41 44.89 43.45	π - 6° 11' 6".05	38.84 37.40 40.98 36.57 38.49 39.61	L. 190° 30' 39".92 R. 190 30 38.58			
L. 198 32	40 27.12 40 35.96	19 26.48 17 45.50	1 19.91 1 6.66	47.03 42.62										
R. 18 32	41 16.16 41 45.66	11 35.57 o 0.71	o 28.38 o 0.00	44.54 45.66										
L. 198 32	41 41.28 41 36.48	5 20.22 7 3.20	o 6.00 o 10.47	47.28 46.95										
7th November	No. 960 B.A.C. (opp.) (B.A.C.)	East	R. 27 48	+ 4 19 37.08 19 34.54		o 6 42.82 4 22.85	- o 9.49 o 4.04	+ 4 19 27.59 30.50				π + 6° 11' 5".84	33.43 36.34 33.69 34.92	L. 190° 30' 32".20
L. 207 48	19 28.14 19 32.46	1 10.08 4 0.05	o 0.29 o 3.38	27.85 29.08										

Observations at XLVI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1851 7th November	No. 960 B.A.C. (opp.) (B.A.C.)	East (contd.)	R. 27 48	+ 4 19 54.82	Level readings insufficient	h m s	' "	° ' "	π + 6° 11' 5".84		R. 190° 30' 35".80	
				20 6.32		0 10 55.96	- 0 25.24	+ 4 19 29.58				"
			L. 207 48	20 42.24		12 42.94	0 34.15	32.17				35.42
				20 59.82		19 11.86	1 17.92	24.32				38.01
						21 15.84	1 35.62	24.20				30.16
												30.04
	No. 960 B.A.C. (opp.) (B.A.C.)	West	L. 207 48	+ 16 38 49.06		0 28 38.68	+ 2 53.67	+ 16 41 42.73	37.07	π - 6° 11' 5".66		L. 190° 30' 37".68 R. 190 30 38.18
				39 35.00		24 40.73	2 8.85	43.85	38.19			
			R. 27 48	40 33.04		17 53.81	1 7.70	40.74	35.08			
				40 54.48		15 20.85	0 49.77	44.25	38.59			
			L. 207 48	41 32.88		7 34.94	0 12.13	45.01	39.35			
				41 41.78		0 1.97	0 0.00	41.78	36.12			
No. 960 B.A.C. (opp.) (B.A.C.)	West	R. 27 48	41 32.30	7 53.87	0 13.12	45.42	39.76	π - 6° 11' 5".25		Vide 4th November		
			41 22.64	10 17.84	0 22.30	44.94	39.28					
		R. 0 2	+ 16 39 18.04	0 26 19.52	+ 2 26.64	+ 16 41 44.68	39.43					
			39 41.28	24 27.54	2 6.56	47.84	42.59					
		L. 180 2	40 40.50	17 42.63	1 6.30	46.80	41.55					
			40 53.66	15 58.65	0 53.94	47.60	42.35					
No. 960 B.A.C. (opp.) (B.A.C.)	West	R. 0 2	41 24.30	10 29.71	0 23.26	47.56	42.31					
			41 46.60	0 0.84	0 0.00	46.60	41.35					
		L. 180 2	41 45.10	5 51.09	0 7.21	52.31	47.06					
			41 34.98	7 42.06	0 12.48	47.46	42.21					

Mean Azimuth of R. M. by Eastern Elongation	..	..	..	..	..	190 30 35.71
Do. do. do. by Western do.	..	..	..	..	..	190 30 39.85
Concluded do. do. by both Elongations	..	..	..	..	..	190 30 37.78
Angle XLVIII and R. M. as on following page	..	..	..	..	..	- 68 47 27.42
Observed Azimuth of XLVIII	..	..	..	..	..	121 43 10.36
Computed do. do. in terms of the initial value adopted at Kalíanpúr;	..	..	..	..	..	121 43 12.01
see page 47 <sub>b</sub>	..	..	..	..	..	
Observed—Computed Azimuth	..	..	..	..	..	- 1.65

Observations at XLVI—(Continued).

At XLVI											
November 1851, observed by Captain A. Strange and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on XLVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	291° 14'	111° 14'	298° 25'	118° 25'	305° 37'	125° 37'	312° 49'	132° 49'	320° 1'	140° 1'	
XLVIII & R. M.	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 27".42 <i>w</i> = 12.30 $\frac{1}{w}$ = 0.08 <i>C</i> = 68° 47' 27".42
	h28.72	h27.84	h27.88	h28.06	h28.72	h26.58	h25.88	h27.42	h26.38	h26.16	
	h27.30	h28.72	h27.72	h27.86	h28.12	h27.22	h27.38	h28.10	h25.68	h26.62	
	28.01	28.28	27.80	27.96	28.42	26.90	26.63	27.76	26.03	26.39	

Observations at LI,

Lat. N. 24° 36' 56".19, Long. E. 71° 55' 36".09 =  $\overset{h}{4} \overset{m}{47} \overset{s}{42.4} = 0.200$ , Height above mean sea level 362 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851	<i>a</i> Ursæ Minoris (conj.) (N.A.)	West	R. 0 I	0 1 2 59 50.90	Level readings insufficient	<i>h</i> <i>m</i> <i>s</i>	' "	0 1 2 59 50.89	π - 1° 38' 0".87	"	L. 175° 22' 4".84 R. 175 22 8.38
				59 50.88		0 0 18.65	+ 0 0.01	8.24			
			L. 180 I	59 57.66		1 33.33	0 0.14	8.39			
				59 59.20		8 6.26	0 3.67	5.14			
			R. 0 I	60 3.36		9 44.24	0 5.30	5.23			
				60 4.72		14 45.19	0 12.17	7.94			
31st March			60 20.04	16 8.17	0 14.55	50.74	51.19	50.17	8.96		
			60 23.18	21 14.12	0 25.19	53.99	54.85	54.85	4.28		
				22 42.10	0 28.78	50.74	54.40	54.40	4.73		

Observations at LI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
			° ' "	° ' "		h m s	' "	° ' "		"	"	
1851 1st April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	West	L. 189 16	- 2 60 29.00	Level readings insufficient	0 25 11.13	+ 0 35.51	- 2 59 53.49	$\pi - 1^{\circ} 38' 1'' .20$	5.31	L. 175° 22' 6''.20 R. 175 22 10 .76	
				60 22.10		23 51.14	0 31.85	50.25		8.55		
			R. 9 16	60 10.96		19 19.19	0 20.90	50.06		8.74		
				60 3.50		17 51.21	0 17.85	45.65		13.15		
			L. 189 16	60 2.18		12 54.26	0 9.32	52.86		5.94		
				59 53.82		0 6.60	0 0.00	53.82		4.98		
	$\alpha$ Ursæ Minoris (conj.) (N.A.)	East	R. 9 16	59 50.34		5 46.54	0 1.87	48.47		10.33		
				59 50.98		7 19.53	0 3.00	47.98		10.82		
			R. 9 17	- 6 15 9.38		0 28 51.78	- 0 46.49	- 6 15 55.87		5.51		
				15 11.88		27 27.80	0 42.10	53.98		7.40		
			L. 189 16	15 27.32		22 47.85	0 29.03	56.35		5.03		
				15 30.38		21 28.86	0 25.78	56.16		5.22		
1st April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	East	R. 9 17	15 38.02	16 40.91	0 15.55	53.57	7.81				
				15 40.28	15 20.93	0 13.17	53.45	7.93				
			L. 189 16	15 48.16	10 15.98	0 5.89	54.05	7.33				
				15 56.58	0 1.91	0 0.00	56.58	4.80				
			L. 198 32	- 6 15 4.94	0 29 15.60	- 0 47.78	- 6 15 52.72	8.99				
				15 12.32	27 41.61	0 42.81	55.13	6.58				
	2nd April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	East	R. 18 32	15 25.58	22 43.67	0 28.85	54.43	7.28			
					15 27.56	21 9.68	0 25.02	52.58	9.13			
				L. 198 32	15 42.46	16 5.74	0 14.48	56.94	4.77			
					15 41.50	14 41.75	0 12.07	53.57	8.14			
				R. 18 32	15 47.60	10 25.80	0 6.08	53.68	8.03			
					15 56.14	0 0.09	0 0.00	56.14	5.57			
3rd April	$\alpha$ Ur. Min. (conj.) (N.A.)	West	R. 27 48	- 2 60 5.54	0 16 18.10	+ 0 14.88	- 2 59 50.66	$\pi - 1^{\circ} 38' 1'' .87$	7.47	L. 175° 22' 5''.43		
				59 59.84	14 36.12	0 11.94	47.90		10.23			
			L. 207 48	59 54.18	5 32.22	0 1.72	52.46		5.67			
				59 51.78	0 0.72	0 0.00	51.78		6.35			

Observations at LI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851											
3rd April	$\alpha$ Ur. Min. (conj.) (N.A.)	West (contd.)	R. 27 48 L. 207 48	° ' " - 2 59 50.76 59 49.46 60 0.18 60 1.84		h m s 0 5 2.67 6 14.66 10 55.61 12 31.59	' " + 0 1.42 0 2.18 0 6.68 0 8.77	° ' " - 2 59 49.34 47.28 53.50 53.07	$\pi - 1^{\circ} 38' 1''.87$	" 8.79 10.85 4.63 5.06	R. 175° 22' 9".34
3rd April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	East	R. 27 48 L. 207 48 R. 27 48 L. 207 48	° ' " - 6 15 13.98 15 16.56 15 33.24 15 35.88 15 44.44 15 45.38 15 54.26 15 57.24		0 27 29.51 26 9.52 20 25.58 19 0.60 14 11.65 11 35.66 6 58.72 0 0.20	- 0 42.19 0 38.21 0 23.31 0 20.20 0 11.26 0 7.52 0 2.72 0 0.00	- 6 15 56.17 54.77 56.55 56.08 55.70 52.90 56.98 57.24	$\pi + 1^{\circ} 38' 2''.09$	5.92 7.32 5.54 6.01 6.39 9.19 5.11 4.85	L. 175° 22' 5".38 R. 175 22 7 .21
4th April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	West	R. 18 32 L. 198 32 R. 18 32 L. 198 32	° ' " - 2 60 32.16 60 25.72 60 15.02 60 8.68 59 57.92 59 45.84 59 54.94 59 55.24	Level readings insufficient	0 27 42.81 26 23.82 20 11.89 17 56.91 13 5.97 0 0.11 5 28.83 6 42.82	+ 0 43.00 0 39.01 0 22.84 0 18.04 0 9.61 0 0.00 0 1.68 0 2.52	- 2 59 49.16 46.71 52.18 50.64 48.31 45.84 53.26 52.72	$\pi - 1^{\circ} 38' 2''.39$	8.54 10.99 5.52 7.06 9.39 11.86 4.44 4.98	L. 175° 22' 5".50 R. 175 22 10 .19
7th April	Ursæ Minoris (conj.) (N.A.)	East	L. 180 1 R. 0 1 L. 180 1 R. 0 1	° ' " - 6 15 21.56 15 27.04 15 33.98 15 35.54 15 48.12 15 49.98 15 51.28 15 53.18		0 25 15.32 23 57.33 19 12.38 17 51.40 13 36.44 12 14.46 7 23.51 0 0.41	- 0 35.63 0 32.06 0 20.62 0 17.83 0 10.36 0 8.38 0 3.06 0 0.00	- 6 15 57.19 59.10 54.60 53.37 58.48 58.36 54.34 53.18	$\pi + 1^{\circ} 38' 3''.47$	6.28 4.37 8.87 10.10 4.99 5.11 9.13 10.29	L. 175° 22' 5".19 R. 175 22 9 .60

Observations at LI—(Continued).

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	...	...	...	...	175 22 6.84
Do. do. do. by Western do.	...	...	...	...	...	...	...	...	175 22 7.58
Concluded do. do. by both Elongations	...	...	...	...	...	...	...	...	175 22 7.21
Angle R. M. and LII, as below	...	...	...	...	...	...	...	+	6 38 7.30
Observed Azimuth of LII	...	...	...	...	...	...	...	...	182 0 14.51
Computed do. do. in terms of the initial value } adopted at Kaliánpúr; see page 47— <sub>b</sub>	...	...	...	...	...	...	...	...	182 0 16.38
Observed—Computed Azimuth	...	...	...	...	...	...	...	—	1.87

At LI

April 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on R. M.										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	121° 17'	301° 17'	128° 29'	308° 28'	135° 41'	315° 40'	142° 52'	322° 52'	150° 4'	330° 4'	
R. M. & LII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 7".33 <i>w</i> = 4.80 $\frac{1}{w}$ = 0.21 <i>C</i> = 6° 38' 7".30
	<i>d</i> 9.07	<i>h</i> 8.48	<i>l</i> 7.88	<i>l</i> 8.08	<i>l</i> 8.70	<i>l</i> 7.16	<i>h</i> 6.52	<i>h</i> 5.90	<i>l</i> 7.84	<i>l</i> 9.52	
	<i>d</i> 8.67	<i>h</i> 7.78	<i>l</i> 5.78	<i>l</i> 7.84	<i>l</i> 6.40	<i>l</i> 5.84	<i>d</i> 7.37	<i>h</i> 5.92	<i>l</i> 8.36	<i>l</i> 8.66	
	<i>d</i> 6.94		<i>d</i> 5.94		<i>d</i> 7.23	<i>d</i> 7.80	<i>d</i> 2.96		<i>d</i> 9.30		
	<i>d</i> 7.14						<i>d</i> 2.58				
	7.96	8.13	6.53	7.96	7.44	6.93	4.86	5.91	8.50	9.09	



Observations at LVII,

Lat. N.  $24^{\circ} 46' 44'' \cdot 68$ , Long. E.  $71^{\circ} 36' 34'' \cdot 66 = 4 \overset{h}{46} \overset{m}{26} \overset{s}{3} = 0 \cdot 199$ , Height above mean sea level 132 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.						
						In Time	In Arc			Seconds of each observation	Mean by each Face					
1851																
22nd November	No. 1235 B.A.C. (opp.) (Gh. Cat. 1864.)	East	R. 0 1 L. 180 1	+28 1 36'82 1 22'78 0 52'62 0 41'56	Level readings insufficient	<i>h m s</i> 0 19 37'48 17 45'51 11 42'60 9 37'63	<i>' ''</i> - 1 9'89 0 57'26 0 24'93 0 16'86	<i>o i n</i> + 28 0 26'93 25'52 27'69 24'70	$\pi + 5^{\circ} 20' 20'' \cdot 68$	<i>''</i> 47'61 46'20 48'37 45'38	L. 213° 20' 47''·48 R. 213 20 47 '41					
		R. 0 1 L. 180 1	0 28'54 0 28'12 0 37'88 0 41'08	3 27'72 0 1'77 6 52'13 9 14'09		0 2'18 0 0'00 0 8'61 0 15'56	26'36 28'12 29'27 25'52	47'04 48'80 49'95 46'20								
22nd November	No. 1235 B.A.C. (opp.) (Gh. Cat. 1864.)	West	R. 0 1 L. 180 1	+38 39 42'20 39 59'72 40 30'16 40 41'18			0 20 53'87 18 55'90 13 40'97 11 44'00	+ 1 19'80 1 5'47 0 34'18 0 25'13		+ 38 41 2'00 5'19 4'34 6'31		$\pi - 5^{\circ} 20' 20'' \cdot 49$	41'51 44'70 43'85 45'82	L. 213° 20' 47''·11 R. 213 20 44 '40		
		R. 0 1 L. 180 1	40 56'72 41 2'56 41 10'64 41 8'36	6 40'08 5 14'10 0 0'82 2 1'79		0 8'11 0 5'00 0 0'00 0 0'75	4'83 7'56 10'64 9'11	44'34 47'07 50'15 48'62								
23rd November	No. 1235 B.A.C. (opp.) (Gh. Cat. 1864.)	East	R. 9 16 L. 189 16	+28 1 9'72 0 58'64 0 39'38 0 27'88			0 14 58'79 13 1'82 7 5'90 0 2'01	- 0 40'76 0 30'86 0 9'17 0 0'00		+ 28 0 28'96 27'78 30'21 27'88			$\pi + 5^{\circ} 20' 20'' \cdot 30$		49'26 48'08 50'51 48'18	L. 213° 20' 49''·36 R. 213 20 49 '49
		R. 9 16 L. 189 16	0 41'62 0 45'54 1 13'00 1 22'18	7 36'88 9 31'85 15 18'77 17 13'74		0 10'58 0 16'57 0 42'82 0 54'21	31'04 28'97 30'18 27'97	51'34 49'27 50'48 48'27								

NOTE.—Gh. Cat. 1864 stands for Greenwich Seven-year Catalogue for 1864.

Observations at LVII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1851														
23rd November	No. 1235 B.A.C. (opp.) (Gh. Cat. 1864.)	West	R. 9 16	+38 40 2'38 40 16'24	Level readings insufficient	h m s	' "	o ' "	$\pi - 5^{\circ} 20' 20''.11$	L. 213° 20' 48''.51 R. 213 20 46 '86				
		L. 189 16	40 44'30 40 53'40	0 18 49'28 16 46'31		+ 1 4'72 0 51'37	+38 41 7'10 7'61	46'99 47'50						
		R. 9 16	41 5'28 41 7'10	0 0'44 2 5'41		0 0'00 0 0'80	5'28 7'90	45'17 47'79						
		L. 189 16	40 56'74 40 48'62	8 42'43 10 53'28		0 13'83 0 21'56	7'23 10'18	47'12 50'62 50'07						
24th November	No. 1235 B.A.C. (opp.) (Gh. Cat. 1864.)	East	L. 198 32	+28 1 15'34 1 4'12			o ' "	+ 28 0 27'34 23'28			$\pi + 5^{\circ} 20' 19''.91$	L. 213° 20' 46''.16 R. 213 20 48 '22		
		R. 18 32	0 50'80 0 28'70	0 16 15'52 14 59'54		- 0 48'00 0 40'84	47'25 43'19							
		L. 198 32	0 33'18 0 30'62	10 47'60 0 0'26		0 21'18 0 0'00	49'53 48'61							
		R. 18 32	0 46'30 0 49'16	4 25'19 5 40'18		0 3'56 0 5'86	49'53 44'67							
24th November	No. 1235 B.A.C. (opp.) (Gh. Cat. 1864.)	West	R. 18 32	+38 39 2'26 39 14'82			o ' "	+38 41 3'56 6'43					$\pi - 5^{\circ} 20' 19''.72$	L. 213 20' 48''.74 R. 213 20 46 '23
		L. 198 32	39 50'86 39 53'52	0 25 45'61 24 42'62		+ 2 1'30 1 51'61	43'84 46'71							
		R. 18 32	40 20'58 40 27'22	20 54'67 19 55'68		1 19'89 1 12'56	51'03 46'36							
		L. 198 32	40 43'02 40 51'36	15 53'74 14 46'75		0 46'14 0 39'88	47'00 47'38							
24th November	No. 1235 B.A.C. (opp.) (Gh. Cat. 1864.)	West	R. 27 48	+38 40 59'96 40 56'16		o ' "	+38 41 9'57 8'24	$\pi - 5^{\circ} 20' 19''.72$	L. 213° 20' 45''.69					
		L. 207 48	40 43'80 40 41'96	0 7 15'97 8 8'96	+ 0 9'61 0 12'08	49'85 48'52								
				11 11'92 12 11'91	0 22'80 0 27'04	46'88 49'28								

Observations at LVII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851	No. 1235 B.A.C. (opp:) (Gh. Cat. 1864.)	West (contd.)	R. 27 48	0 0 0	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	π - 5° 20' 19".72	"	R. 213° 20' 46".85
+38 40 20.60			0 15 40.86	+ 0 44.65		+38 41 5.25	45.53				
40 12.28			16 44.85	0 50.93		3.21	43.49				
L. 207 48			39 49.78	20 21.80		1 15.24	5.02	45.30			
39 38.88			21 14.79	1 21.89		0.77	41.05				
R. 27 48			+28 0 42.82	0 8 2.10		- 0 11.75	+28 0 31.07	50.59			
0 37.84		6 41.12	0 8.13	29.71		49.23					
L. 207 48		0 27.48	2 45.17	0 1.38		26.10	45.62				
0 26.24		0 0.79	0 0.00	26.24		45.76					
R. 27 48		0 34.30	4 36.73	0 3.88		30.42	49.94				
0 34.44		5 42.71	0 5.95	28.49		48.01					
L. 207 48		0 47.04	10 11.65	0 18.96		28.08	47.60				
0 50.56	11 46.63	0 25.32	25.24	44.76							

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	...	213 20 47.94
Do. do. do. by Western do.	...	...	...	...	...	213 20 46.79
Concluded do. do. by both Elongations	...	...	...	...	...	213 20 47.37
Angle R. M. and LV; as on next page	...	...	...	...	... +	31 6 59.90
Observed Azimuth of LV	...	...	...	...	...	244 27 47.27
Computed do. do. in terms of the initial value adopted at Kalíanpúr; see page 48 <sub>b</sub>	...	...	...	...	... }	244 27 44.41
Observed—Computed Azimuth	...	...	...	...	... +	2.86

Observations at LVII—(Continued).

At LVII											
November 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on R. M.										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
R. M. & LV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 59''·89 <i>w</i> = 7·73 $\frac{1}{w}$ = 0·13 <i>C</i> = 31° 6' 59''·90
	h58°04	l58°86	h59°32	h60°84	h60°22	h60°48	h58°54	h59°36	h59°18	h62°34	
	h57°98	l60°04	h59°60	h59°84	h59°44	h62°10	h59°24	h60°82	h60°64	h61°12	
					h61°12						
	58°01	59°45	59°46	60°34	59°83	61°23	58°89	60°09	59°91	61°73	

Observations at LXII,

Lat. N. 24° 51' 19''·36, Long. E. 71° 21' 24''·87 =  $4^{\text{h}} 45^{\text{m}} 25^{\text{s}} \cdot 7 = 0^{\text{d}} \cdot 198$ , Height above mean sea level 212 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851	ε Ur. Min. (conj.) (N.A.)	West	R. 0 1	0' 36" 52·4	Level readings insufficient	<i>h m s</i>	<i>' "</i>	0' 33" 28·47	π—8° 31' 10''·26	"	L. 109° 55' 24''·06
21 13·97			+ 2 36·77	21' 27"							
21 36·00			2 15·46	22' 60"							
16 5·08			1 15·03	24' 51"							
			L. 180 1	34 40·26		14 48·09	1 3' 51	25' 37"		24' 37"	
				34 28·88							

Observations at LXII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.					
						In Time	In Arc			Seconds of each observation	Mean by each Face				
1851															
3rd December	$\epsilon$ Ur. Min. (conj.) (N.A.)	West (contd.)	R. 0 1	0 1 -61 33 53.88 33 26.62		h m s	' "	0 1 " -61 33 27.46 26.61	$\pi - 8^{\circ} 31' 10'' .26$	" 22.28 23.13	R. 109° 55' 22".32				
			L. 180 1	33 34.72 33 40.34		0 9 33.17 0 9.30 5 33.61 6 58.59	+ 0 26.42 0 0.01 0 8.92 0 14.03	25.80 26.31	23.94 23.43						
3rd December	$\epsilon$ Ursæ Minoris (conj.) (N.A.)	East	R. 0 1	-78 31 48.54 32 7.46	Level readings insufficient	0 28 53.10 27 47.12	- 3 58.80 3 41.05	-78 35 47.34 48.51	$\pi + 8^{\circ} 31' 10'' .46$	23.12 21.95	L. 109° 55' 22".91 R. 109 55 21 .84				
			L. 180 1	32 51.36 33 5.68		24 45.16 23 50.18	2 55.61 2 42.90	46.97 48.58		23.49 21.88					
			R. 0 1	33 50.02 34 0.06		20 25.23 19 28.24	1 59.70 1 48.85	49.72 48.91		20.74 21.55					
			L. 180 1	35 41.36 35 47.94		4 18.47 0 0.53	0 5.35 0 0.00	46.71 47.94		23.75 22.52					
4th December	$\epsilon$ Ursæ Minoris (conj.) (N.A.)	West	R. 9 16	-61 33 49.52 33 43.38		0 8 48.77 7 34.79	+ 0 22.48 0 16.63	-61 33 27.04 26.75		$\pi - 8^{\circ} 31' 10'' .65$		22.31 22.60	L. 109° 55' 21".93 R. 109 55 22 .93		
			L. 189 16	33 31.82 33 26.26		3 26.85 0 9.89	0 3.44 0 0.01	28.38 26.25				20.97 23.10			
			R. 9 16	33 35.28 33 36.48		5 15.03 6 26.01	0 7.95 0 11.93	27.33 24.55				22.02 24.80			
			L. 189 16	34 1.92 34 9.54		10 47.95 12 11.93	0 33.58 0 42.83	28.34 26.71				21.01 22.64			
4th December	$\epsilon$ Ursæ Minoris (conj.) (N.A.)	East	L. 189 16	-78 32 4.80 32 29.38		0 28 1.37 26 25.39	- 3 44.83 3 20.01	-78 35 49.63 49.39				$\pi + 8^{\circ} 31' 10'' .86$		21.23 21.47	L. 109° 55' 21".67 R. 109 55 20 .92
			R. 9 16	33 36.68 33 54.78		21 29.46 20 7.48	2 12.57 1 56.26	49.25 51.04						21.61 19.82	
			L. 189 16	34 41.56 34 51.68		15 17.55 14 6.57	1 7.24 0 57.26	48.80 48.94						22.06 21.92	
			R. 9 16	35 43.90 35 50.42		4 13.72 0 0.78	0 5.16 0 0.00	49.06 50.42						21.80 20.44	

Observations at LXII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1851	5th December	West	L. 198 32	0 1	0 1 "	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>o ' "</i>	$\pi - 8^{\circ} 31' 11'' \cdot 05$	$\pi - 8^{\circ} 31' 11'' \cdot 05$	L. 109° 55' 23"·11 R. 109 55 22·48	
				33 58·34	0 10 40·32		+ 0 32·99	-61 33 25·35	23·60				
				33 50·54	9 13·34		0 24·63	25·91	23·04				
				R. 18 32	33 32·70		4 23·41	0 5·57	27·13				21·82
				33 27·10	0 1·48		0 0·00	27·10	21·85				
				L. 198 32	33 32·72		4 52·45	0 6·85	25·87				23·08
	33 38·18	6 26·43	0 11·96	26·22	22·73								
	R. 18 32	34 1·72	11 5·36	0 35·40	26·32		22·63						
	34 9·74	12 25·34	0 44·41	25·33	23·62								
	5th December	East	R. 18 32	-78 31 16·28	0 30 50·95		- 4 32·20	-78 35 48·48	22·78				L. 109° 55' 22"·93 R. 109 55 20·38
	31 35·82	29 52·96	4 15·50	51·32	19·94								
	L. 198 32	32 17·86	27 2·00	3 29·30	47·16		24·10						
32 34·44	26 8·02	3 15·67	50·11	21·15									
R. 18 32	33 14·78	23 20·06	2 36·14	50·92	20·34								
33 27·14	22 32·07	2 25·66	52·80	18·46									
L. 198 32	33 56·94	19 43·11	1 51·64	48·58	22·68								
34 4·16	18 58·12	1 43·33	47·49	23·77									
5th December	East	R. 27 48	-78 35 46·86	0 4 25·34	- 0 5·64	-78 35 52·50	18·76						
35 47·82	3 42·35	0 3·96	51·78	19·48									
L. 207 48	35 47·88	1 6·39	0 0·35	48·23	23·03								
35 49·86	0 1·41	0 0·00	49·86	21·40									
R. 27 48	35 50·18	2 57·55	0 2·53	52·71	18·55								
35 49·90	3 36·54	0 3·77	53·67	17·59									
L. 207 48	35 34·56	6 44·49	0 13·15	47·71	23·55								
35 31·98	7 36·48	0 16·75	48·73	22·53									
6th December	West	R. 27 48	-61 33 40·24	0 6 32·50	+ 0 12·38	-61 33 27·86	20·69	$\pi - 8^{\circ} 31' 11'' \cdot 45$	L. 109° 55' 21"·84				
33 33·78	5 19·52	0 8·20	25·58	22·97									
L. 207 48	33 25·76	0 4·60	0 0·00	25·76	22·79								
33 27·38	1 20·37	0 0·52	26·86	21·69									

Observations at LXII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851 6th December	$\epsilon$ Ur. Min. (conj.) (N.A.)	West (contd.)	° ' R. 27 48 L. 207 48	° ' " -61 33 34 <sup>o</sup> 02 33 37 <sup>o</sup> 02 33 56 <sup>o</sup> 12 34 3 <sup>o</sup> 70	Level readings insufficient	h m s 0 5 4 <sup>o</sup> 31 6 6 <sup>o</sup> 30 10 1 <sup>o</sup> 23 11 17 <sup>o</sup> 21	' " + 0 7 <sup>o</sup> 42 0 10 <sup>o</sup> 75 0 28 <sup>o</sup> 92 0 36 <sup>o</sup> 67	° ' " -61 33 26 <sup>o</sup> 60 26 <sup>o</sup> 27 27 <sup>o</sup> 20 27 <sup>o</sup> 03	$\pi$ - 8° 31' 11 <sup>o</sup> .45	" 21 <sup>o</sup> 95 22 <sup>o</sup> 28 21 <sup>o</sup> 35 21 <sup>o</sup> 52	R. 109° 55' 21 <sup>o</sup> .97

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	109 55 21 <sup>o</sup> .48
Do. do. do. by Western do.	...	...	...	...	109 55 22 <sup>o</sup> .58
Concluded do. do. by both Elongations	...	...	...	...	109 55 22 <sup>o</sup> 03
Angle LXIII and R. M., as below	...	...	...	...	- 37 23 5 <sup>o</sup> .60
Observed Azimuth of LXIII	...	...	...	...	72 32 16 <sup>o</sup> .43
Computed do. do. in terms of the initial value adopted at Kaliánpúr; see page 48— <sub>b</sub>	...	...	...	...	72 32 15 <sup>o</sup> .27
Observed — Computed Azimuth	...	...	...	...	+ 1 <sup>o</sup> .16

At LXII

December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on LXIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	822° 38'	142° 38'	329° 49'	149° 49'	337° 1'	157° 1'	344° 13'	164° 13'	351° 25'	171° 25'	
LXIII & R. M.	h 5 <sup>o</sup> .66 h 6 <sup>o</sup> .30	h 5 <sup>o</sup> .76 h 7 <sup>o</sup> .76	h 5 <sup>o</sup> .42 h 5 <sup>o</sup> .10	d 3 <sup>o</sup> .86 d 6 <sup>o</sup> .36 d 5 <sup>o</sup> .90	h 5 <sup>o</sup> .04 h 6 <sup>o</sup> .48	h 5 <sup>o</sup> .48 h 5 <sup>o</sup> .76	h 5 <sup>o</sup> .92 h 4 <sup>o</sup> .56	h 6 <sup>o</sup> .46 h 6 <sup>o</sup> .70	h 6 <sup>o</sup> .02 h 4 <sup>o</sup> .64	h 3 <sup>o</sup> .46 h 4 <sup>o</sup> .80	M = 5 <sup>o</sup> .60 w = 12 <sup>o</sup> .64 I w = 0 <sup>o</sup> .08 C = 37° 23' 5 <sup>o</sup> .60
	5 <sup>o</sup> .98	6 <sup>o</sup> .76	5 <sup>o</sup> .26	5 <sup>o</sup> .37	5 <sup>o</sup> .76	5 <sup>o</sup> .62	5 <sup>o</sup> .24	6 <sup>o</sup> .58	5 <sup>o</sup> .33	4 <sup>o</sup> .13	

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at LXVII,

Lat. N. 24° 56' 36".25, Long. E. 71° 5' 25".99 =  $4^{\text{h}} 44^{\text{m}} 21.7^{\text{s}}$  = 0.197, Height above mean sea level 460 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1851 12th December	No. 1662 B.A.C. (opp.) (B.A.C.)	West	R. 0 1	0 1	-63 53 55.18	Level readings insufficient	h m s	' "	0 30 22.95	+ 2 50.83	-63 50 64.35	"	45.79
					53 43.24		29 27.96	2 40.67	62.57	47.57			
			L. 180 1		53 14.52		26 32.00	2 10.24	64.28	45.86			
					53 2.84		25 41.01	2 2.03	60.81	49.33			
			R. 0 1		52 35.48		22 40.05	1 35.02	60.46	49.68			
					52 33.16		21 50.06	1 28.16	65.00	45.14			
		L. 180 1		52 4.88	18 32.11		1 3.51	61.37	48.77				
				51 57.24	17 37.12		0 57.37	59.87	50.27				
		12th December	No. 1662 B.A.C. (opp.) (B.A.C.)	West	R. 9 16			-63 51 8.34	0 5 33.58	+ 0 5.69	-63 50 62.65	π - 5° 24' 9".86	47.49
								51 6.52	6 26.57	0 7.64	58.88		51.26
					L. 189 16			51 15.24	9 32.53	0 16.76	58.48		51.66
								51 20.78	10 31.51	0 20.38	60.40		49.74
R. 9 16					51 35.66	13 21.48	0 32.81	62.85	47.29				
					51 38.44	14 12.47	0 37.11	61.33	48.81				
L. 189 16		51 55.10	17 19.43	0 55.13	59.97	50.17							
		52 3.46	18 21.41	1 1.89	61.57	48.57							
13th December	No. 1662 B.A.C. (opp.) (B.A.C.)	East	R. 0 1		-74 36 36.28	0 29 50.07	- 2 43.02	-74 39 19.30	π + 5° 24' 9".66	50.36			
					36 44.92	28 54.08	2 33.02	17.94		51.72			
			L. 180 1		37 12.88	26 12.12	2 5.86	18.74		50.92			
					37 24.34	25 18.13	1 57.39	21.73		47.93			
			R. 0 1		37 49.06	22 11.17	1 30.32	19.38		50.28			
					37 57.18	21 18.18	1 23.29	20.47		49.19			
L. 180 1		38 23.08	17 51.23	0 58.55	21.63	48.03							
		38 27.58	17 0.24	0 53.12	20.70	48.96							

L. 110° 44' 48".56  
R. 110 44 47.04

L. 110° 44' 50".04  
R. 110 44 48.71

L. 110° 44' 48".96  
R. 110 44 50.39



Observations at LXVII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1851													
13th December	No. 1662 B.A.C. (opp.) (B.A.C.)	East	R. 9 16 L. 198 16	° ' " -74 39 16.60 39 15.86 39 5.18	Level readings insufficient	<i>h m s</i> 0 4 59.46 5 55.45 9 35.40 10 28.39	<i>' "</i> - 0 4.60 0 6.48 0 16.98 0 20.25	° ' " -74 39 21.20 22.34 22.16 23.59	π + 5° 24' 9".66	" 48.46 47.32 47.50 46.07 48.66 48.02	L. 110° 44' 46".92 R. 110 44 48 .11		
			R. 9 16 L. 189 16	38 44.42 38 40.04 38 14.92 38 10.62		14 4.34 15 0.33 18 53.27 19 58.26	0 36.58 0 41.60 1 5.95 1 13.74	21.00 21.64 20.87 24.36		48.79 45.30			
		West	R. 18 32 L. 198 32	-63 52 55.96 52 47.44 52 16.86 52 11.16		0 24 46.89 23 48.91 20 10.95 19 19.97	+ 1 53.59 1 44.90 1 15.31 1 9.09	-63 51 2.37 2.54 1.55 2.07		π - 5° 24' 9".48		48.15 47.98 48.97 48.45 48.39 46.02	
			R. 18 32 L. 198 32	51 48.94 51 45.98 51 27.42 51 24.00		15 55.01 14 59.02 11 45.06 10 48.08	0 46.81 0 41.48 0 25.50 0 21.54	2.13 4.50 1.92 2.46				48.60 48.06	
		West	R. 27 48 L. 207 48	-63 51 30.26 51 35.74 51 49.36 51 59.22		0 11 56.63 13 7.61 16 29.57 17 26.55	+ 0 26.24 0 31.68 0 49.98 0 55.89	-63 50 64.02 64.06 59.38 63.33				π - 5° 24' 9".48	46.50 46.46 51.14 47.19 46.17 45.22
			R. 27 48 L. 207 48	52 25.88 52 36.34 53 4.28 53 15.20		21 4.51 22 16.49 25 50.44 26 57.43	1 21.53 1 31.04 2 2.42 2 13.19	64.35 65.30 61.86 62.01					48.66 48.51
		East	R. 18 32 L. 198 32	-74 38 54.18 38 58.68 39 13.06 39 20.52		0 11 55.86 10 50.87 6 39.93 0 1.02	- 0 26.18 0 21.65 0 8.18 0 0.00	-74 39 20.36 20.33 21.24 20.52	π + 5° 24' 9".30		48.94 48.97 48.06 48.78		L. 110° 44' 48".24

Observations at LXVII—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851											
14th December	No. 1662 B.A.C. (opp:) (B.A.C.)	East (contd.)	R. 18 32	0' 18" 39' 74" 10' 18"	Level readings insufficient	h m s'	' "	0' 18" 39' 74" 10' 18"	π + 5° 24' 9".30	"	R. 110° 44' 49".07
			L. 198 32	38 57.88		0 7 9.88	- 0 9.48	-74 39 19.66		49.64	
				38 31.90		11 4.83	0 22.67	20.55		48.75	
				38 25.30		16 26.76	0 49.98	21.88		47.42	
						17 17.74	0 55.29	20.59		48.71	
			L. 207 48	-74 39 7.60		0 8 26.68	- 0 13.12	-74 39 20.72		48.20	
15th December	No. 1662 B.A.C. (opp:) (B.A.C.)	East		39 12.14		7 16.70	0 9.75	21.89	47.03	π + 5° 24' 8".92	L. 110° 44' 47".34 R. 110 44 47.65
			R. 27 48	39 18.42		3 11.75	0 1.88	20.30	48.62		
				39 20.68		0 0.80	0 0.00	20.68	48.24		
			L. 207 48	39 18.70		4 36.14	0 3.91	22.61	46.31		
				39 15.36		5 35.13	0 5.76	21.12	47.80		
			R. 27 48	39 2.94		10 4.07	0 18.72	21.66	47.26		
				38 59.12	11 14.05	0 23.31	22.43	46.49			

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	110 44 48.34
Do. do. do. by Western do.	...	...	...	...	110 44 48.18
Concluded do. do. by both Elongations	...	...	...	...	110 44 48.26
Angle LXIX and R. M., as on next page	...	...	...	...	4 31 58.78
Observed Azimuth of LXIX	...	...	...	...	106.12 49.48
Computed do. do. in terms of the initial value adopted } at Kaliánpúr; see page 48 <sub>b</sub> ...	...	...	...	...	106 12 47.72
Observed—Computed Azimuth	...	...	...	...	1.76

Observations at LXVII—(Continued).

At LXVII											
December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	355° 29'	175° 29'	2° 40'	182° 40'	9° 52'	189° 52'	17° 4'	197° 4'	24° 17'	204° 16'	
LXIX & R. M.	"	"	"	"	"	"	"	"	"	"	M = 58''·78
	<i>h</i> 58·76	<i>h</i> 58·52	<i>h</i> 59·22	<i>h</i> 59·96	<i>h</i> 59·02	<i>h</i> 57·86	<i>h</i> 57·46	<i>h</i> 59·38	<i>h</i> 59·60	<i>h</i> 57·38	w = 20·80
	<i>h</i> 58·70	<i>h</i> 59·10	<i>h</i> 58·70	<i>h</i> 58·52	<i>h</i> 58·12	<i>h</i> 58·44	<i>h</i> 59·38	<i>h</i> 60·00	<i>h</i> 59·40	<i>h</i> 57·98	$\frac{1}{w} = 0·05$
	58·73	58·81	58·96	59·24	58·57	58·15	58·42	59·69	59·50	57·68	C = 4° 31' 58''·78

Observations at LXXI,

Lat. N. 24° 58' 23''·16, Long. E. 70° 42' 9''·50 =  $4^{\text{h}} 42^{\text{m}} 48^{\text{s}} \cdot 6 = 0^{\text{d}} \cdot 196$ , Height above mean sea level 588 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851	δ Ur. Min. (conj:) (N.A.)	West		° ' "		<i>h</i> <i>m</i> <i>s</i>	' "	° ' "	π - 3° 45' 5''·24	"	L. 181° 53' 30''·15
R. 0 1			+ 5 38 25·80	0 7 39·77	+ 0 7·54	+ 5 38 33·34	28·10				
			38 28·36	6 21·79	0 5·20	33·56	28·32				
L. 180 1			38 34·84	2 9·85	0 0·60	35·44	30·20				
			38 34·84	0 1·88	0 0·00	34·84	29·60				

Observations at LXXI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851											
19th December	$\delta$ Ur. Min. (conj:) (N.A.)	West (contd.)	R. 0 1	+ 5 38 31.94 38 29.44		h m s	' "	0 4 56.05 6 1.03	+ 0 3.12 0 4.64	+ 5 38 35.06 34.08	" 29.82 28.84
			L. 180 1	38 21.46 38 17.90				10 26.96 11 49.94	0 13.99 0 17.93	35.45 35.83	30.21 30.59
			L. 189 16	+ 5 38 18.46 38 20.94				0 11 28.01 10 2.03	+ 0 16.89 0 12.93	+ 5 38 35.35 33.87	29.78 28.30
20th December	$\delta$ Ursæ Minoris (conj:) (N.A.)	West	R. 9 16	38 31.30 38 36.24				5 48.09 0 3.18	0 4.32 0 0.00	35.62 36.24	30.05 30.67
			L. 189 16	38 36.84 38 30.38				4 43.75 6 0.73	0 2.87 0 4.63	39.71 35.01	34.14 29.44
			R. 9 16	38 19.54 38 16.18				10 38.66 12 4.64	0 14.52 0 18.68	34.06 34.86	28.49 29.29
20th December	$\delta$ Ursæ Minoris (conj:) (N.A.)	East	R. 9 16	- 1 49 41.06 49 46.76	Level readings insufficient			0 30 5.26 29 16.27	- 1 55.56 1 49.39	- 1 51 36.62 36.15	29.12 29.59
			L. 189 16	50 7.34 50 12.88				26 6.31 25 7.33	1 27.07 1 20.65	34.41 33.53	31.33 32.21
			R. 9 16	50 33.42 50 39.12				22 1.37 21 9.38	1 2.01 0 57.24	35.43 36.36	30.31 29.38
			L. 189 16	50 50.00 50 56.14				18 8.42 17 16.43	0 42.11 0 38.19	32.11 34.33	33.63 31.41
20th December	$\delta$ Ursæ Minoris (conj:) (N.A.)	East	R. 0 1	- 1 51 37.38 51 36.64				0 2 12.31 3 3.30	- 0 0.62 0 1.20	- 1 51 38.00 37.84	27.74 27.90
			L. 180 1	51 29.36 51 30.66				5 59.26 6 49.25	0 4.60 0 5.97	33.96 36.63	31.78 29.11
				51 24.56 51 23.40				9 15.22 10 3.21	0 11.00 0 12.98	35.56 36.38	30.18 29.36
			R. 0 1	51 15.56 51 14.52				12 41.17 13 16.16	0 20.68 0 22.62	36.24 37.14	29.50 28.60
											L. 181° 53' 30".11 R. 181 53 28.44

Observations at LXXI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1851														
21st December	δ Ursæ Minoris (conj.) (N.A.)	West	R. 27 48 L. 207 48 R. 27 48 L. 207 48	+ 5 36 46.32 36 52.36 37 14.64 37 18.10 37 36.80 37 43.38 38 0.38 38 3.86	Level readings insufficient	h m s	' "	° ' "	π - 3° 45' 5".90	"	L. 181° 53' 29".14 R. 181 53 29 .13			
						0 29 15.42	+ 1 50.06	+ 5 38 36.38		30.48				
						28 21.43	1 43.39	35.75		29.85				
						25 0.48	1 20.40	35.04		29.14				
						24 10.49	1 15.13	33.23		27.33				
						20 57.53	0 56.46	33.26		27.36				
						19 59.54	0 51.37	34.75		28.85				
						16 43.59	0 35.95	36.33		30.43				
						15 42.60	0 31.71	35.57		29.67				
21st December	δ Ursæ Minoris (conj.) (N.A.)	West	R. 18 32 L. 198 32 R. 18 32 L. 198 32	+ 5 38 29.52 38 26.06 38 21.02 38 12.84 38 0.84 37 57.18 37 38.48 37 28.44			h m s	' "		° ' "		π - 3° 45' 5".90	"	L. 181° 53' 30".89 R. 181 53 30 .49
						0 7 41.08	+ 0 7.57	+ 5 38 37.09		31.19				
						8 37.07	0 9.52	35.58		29.68				
					11 52.02	0 18.04	39.06	33.16						
					13 2.00	0 21.75	34.59	28.69						
					16 29.96	0 34.84	35.68	29.78						
					17 40.94	0 40.01	37.19	31.29						
					21 35.89	0 59.65	38.13	32.23						
					22 52.87	1 6.93	35.37	29.47						
21st December	δ Ursæ Minoris (conj.) (N.A.)	East	R. 18 32 L. 198 32 R. 18 32 L. 198 32	- 1 49 41.62 49 48.54 50 12.24 50 21.58 50 36.98 50 39.88 50 59.48 51 4.34		h m s	' "	° ' "	π + 3° 45' 6".05	"	L. 181° 53' 29".15 R. 181 53 32 .14			
					0 29 40.37	- 1 52.41	- 1 51 34.03	32.02						
					28 42.39	1 45.23	33.77	32.28						
					25 34.43	1 23.57	35.81	30.24						
					24 33.44	1 17.07	38.65	27.40						
					21 18.49	0 58.06	35.04	31.01						
					20 20.50	0 52.93	32.81	33.24						
					16 56.54	0 36.74	36.22	29.83						
					15 57.56	0 32.60	36.94	29.11						
21st December	δ Ur. Min. (conj.) (N.A.)	East	R. 27 48 L. 207 48	- 1 51 35.72 51 32.84 51 32.50 51 29.44		h m s	' "	° ' "		π + 3° 45' 6".05		"	L. 181° 53' 29".49	
					0 2 50.19	- 0 1.03	- 1 51 36.75	29.30						
					3 41.18	0 1.74	34.58	31.47						
					5 58.15	0 4.58	37.08	28.97						
					6 42.14	0 5.77	35.21	30.84						

Observations at LXXI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851 21st December	δ Ur. Min. (conj.) (N.A.)	East (contd.)	L. 207 48 R. 7 48	° ' " — 1 51 24'44 51 22'74 51 13'32 51 13'84	Level readings insufficient	<i>h m s</i> 0 9 50'10 10 34'09 13 44'05 14 24'04	' " — 0 12'42 0 14'35 0 24'23 0 26'64	° ' " — 1 51 36'86 37'09 37'55 40'48	π + 3° 45' 6".05	" 29'19 28'96 28'50 25'57	R. 181° 53' 28".71

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	181 53 29'97
Do. do. do. by Western do.	...	...	...	...	181 53 29'83
Concluded do. do. by both Elongations	...	...	...	...	181 53 29'90
Angle R. M. and LXIX, as below	...	...	...	...	+ 73 15 31'22
Observed Azimuth of LXIX	...	...	...	...	255 9 1'12
Computed do. do. in terms of the initial value } adopted at Kaliánpúr; see page 49 <sub>b</sub>	...	...	...	...	255 8 59'68
Observed—Computed Azimuth	...	...	...	...	+ 1'44

At LXXI

December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on R. M.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
R. M. & LXIX	<i>h</i> 30'24 <i>h</i> 29'68	<i>h</i> 30'84 <i>h</i> 30'96	<i>h</i> 30'56 <i>h</i> 30'30	<i>h</i> 31'18 <i>h</i> 30'98	<i>h</i> 31'56 <i>h</i> 30'58	<i>h</i> 32'00 <i>h</i> 32'30	<i>h</i> 31'14 <i>h</i> 33'92 <i>h</i> 32'06	<i>h</i> 32'84 <i>h</i> 32'26	<i>h</i> 30'34 <i>h</i> 30'90	<i>h</i> 30'72 <i>h</i> 31'22	M = 31".21 w = 11.45 $\frac{1}{w} = 0.09$ C = 73° 15' 31".22
	29'96	30'90	30'43	31'08	31'07	32'15	32'37	32'55	30'62	30'97	

Observations at LXXV,

Lat. N. 24° 57' 26".28, Long. E. 70° 16' 45".08 =  $4^{\text{h}} 41^{\text{m}} 7^{\text{s}} \cdot 0 = 0.195$ , Height above mean sea level 518 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851						<i>h m s</i>	<i>' "</i>	<i>° ' "</i>		<i>"</i>	
27th December	No. 2157 B.A.C. (opp:) (N.A.)	East	R. 0 1	+ 0 45 13.08	Level readings insufficient	0 2 1.33	- 0 0.42	+ 0 45 12.66	$\pi + 3^{\circ} 1' 47''.15$	59.81	L. 183° 46' 57''.78 R. 183 46 58.37
				45 12.64		0 18.63	0 0.01	12.63		59.78	
			L. 180 1	45 16.08		5 32.55	0 3.19	12.89		60.04	
				45 13.90		7 0.53	0 5.10	8.80		55.95	
			R. 0 1	45 23.06		11 14.47	0 13.11	9.95		57.10	
				45 26.82		12 52.44	0 17.20	9.62		56.77	
		L. 180 1	45 42.86	17 30.37		0 31.82	11.04	58.19			
			45 46.78	18 52.35		0 36.98	9.80	56.95			
		West	R. 0 1	+ 6 47 14.12		0 29 21.56	+ 1 29.51	+ 6 48 43.63		56.67	
				47 20.90		28 22.58	1 23.61	44.51		57.55	
			L. 180 1	47 36.60		25 16.63	1 6.35	42.95		55.99	
				47 42.30		24 14.64	1 1.03	43.33		56.37	
R. 0 1	47 54.74		21 17.69	0 47.08	41.82	54.86					
	47 58.34		20 22.70	0 43.12	41.46	54.50					
L. 180 1	48 13.24	17 4.75	0 30.28	43.52	56.56	L. 183° 46' 55''.85 R. 183 46 55.90					
	48 14.94	15 58.77	0 26.51	41.45	54.49						
27th December	No. 2157 B.A.C. (opp:) (N.A.)	West	R. 9 16	+ 6 48 41.26	0 3 26.94	+ 0 1.23	+ 6 48 42.49	$\pi - 3^{\circ} 1' 46''.96$	55.53	L. 183° 46' 55''.53 R. 183 46 54.53	
				48 41.16	4 20.93	0 1.96	43.12		56.16		
			L. 189 16	48 37.26	7 47.88	0 6.30	43.56		56.60		
				48 35.48	8 48.86	0 8.05	43.53		56.57		
				48 26.28	12 4.81	0 15.11	41.39		54.43		
			48 23.66	13 6.80	0 17.80	41.46	54.50				
		R. 9 16	48 11.44	16 38.74	0 28.67	40.11	53.15				
			48 7.74	17 43.73	0 32.52	40.26	53.30				

\* This Star is the same as 51 Cephei (Hev.).

Observations at LXXV—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1851														
28th December	No. 2157 B.A.C. (opp.) (N.A.)	East	R. 9 16 L. 189 16	+ 0 46 43.32 46 37.94 46 18.34 46 10.94	Level readings insufficient	<i>h m s</i> 0 29 46.04	<i>' "</i> - 1 31.48	+ 0 45 11.84 13.17	$\pi + 3^{\circ} 1' 46''.79$	58.63 59.96	L. 183° 46' 57''.52 R. 183 46 57.70			
			R. 9 16 L. 189 16	45 55.50 45 51.48 45 40.30 45 36.36		25 27.11 24 24.13 21 8.17 20 11.19 16 45.24 15 42.26	1 24.77 1 6.93 0 46.19 0 42.14 0 29.04 0 25.52	11.41 9.40 9.31 9.34 11.26 10.84				58.20 56.19 56.10 56.13 58.05 57.63		
28th December	No. 2157 B.A.C. (opp.) (N.A.)	East	R. 18 32 L. 198 32	+ 0 45 15.16 45 16.24 45 22.74 45 25.08			0 6 36.41 7 33.39 11 8.34 12 15.32	- 0 4.53 0 5.92 0 12.88 0 15.59		+ 0 45 10.63 10.32		$\pi + 3^{\circ} 1' 46''.79$	57.42 57.11	L. 183° 46' 56''.69 R. 183 46 56.73
			R. 18 32 L. 198 32	45 35.90 45 39.06 45 54.38 45 57.90		15 57.27 16 55.25 20 24.20 21 41.18	0 26.42 0 29.72 0 43.22 0 48.83	9.48 9.34 11.16 9.07					56.65 56.28 56.27 56.13 57.95 55.86	
28th December	No. 2157 B.A.C. (opp.) (N.A.)	West	R. 18 32 L. 198 32	+ 6 47 17.08 47 23.20 47 46.24 47 51.38			0 28 32.58 27 25.59 23 25.65 22 10.67	+ 1 24.60 1 18.11 0 56.99 0 51.07	+ 6 48 41.68 41.31 43.23 42.45	$\pi - 3^{\circ} 1' 46''.60$	55.08 54.71		L. 183° 46' 55''.31 R. 183 46 53.61	
			R. 18 32 L. 198 32	48 4.54 48 7.56 48 25.22 48 26.54		18 19.73 17 14.75 12 44.82 11 20.84	0 34.88 0 30.87 0 16.86 0 13.36	39.42 38.43 42.08 39.90			55.85 52.82 51.83 55.48 53.30			
28th December	No. 2157 B.A.C. (opp.) (N.A.)	West	R. 27 49 L. 207 49	+ 6 48 21.42 48 17.08 48 6.94 48 3.04			0 13 20.79 14 25.78 18 17.72 19 28.70	+ 0 18.44 0 21.55 0 34.62 0 39.24	+ 6 48 39.86 38.63 41.56 42.28		$\pi - 3^{\circ} 1' 46''.60$	53.26 52.03		L. 183° 46' 55''.51





PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at LXXV—(Continued).

At LXXV											
December 1851, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on R. M.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
R. M. & LXXIII	"	"	"	"	"	"	"	"	"	"	M = 50° 53
	h51° 28	h51° 52	h49° 40	h50° 68	h50° 90	h50° 42	h51° 42	h49° 10	l 50° 12	l 48° 60	w = 13 30
	h50° 38	h50° 62	h49° 16	h51° 30	h51° 98	h50° 96	h51° 64	h50° 46	l 50° 22	l 50° 50	$\frac{1}{w} = 0.08$
	50° 83	51° 07	49° 28	50° 99	51° 44	50° 69	51° 53	49° 78	50° 17	49° 55	C = 70° 14' 50" 53

Observations at LXXX,

Lat. N. 24° 58' 47" 00, Long. E. 69° 53' 50" 48 =  $4^{\text{h}} 39^{\text{m}} 35^{\text{s}} \cdot 4 = 0.194$ , Height above mean sea level 349 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1852	No. 3326 B.A.C. (opp.) (Gh. Cat. 1864.)	East	R. 0 I	0' 0"	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>o' ' "</i>	$\pi + 8^{\circ} 4' 53'' \cdot 38$	62.82	L. 199° 35' 54" 26
+11 32 4.94				0 14 15.12		- 0 55.50	+11 30 69.44				
31 56.68				13 56.44		0 53.49	63.19				
32 42.50				19 23.36		1 43.58	58.92				
33 0.06	20 51.34	1 59.87	60.19	52.30	53.57						

Observations at LXXX—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1852	No. 2326 B.A.C. (opp.) No. 2326 B.A.C. (opp.) No. 2326 B.A.C. (opp.) (Gh. Cat. 1864.)	East (contd.)	R. 0 1	0 1 "	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	π + 8° 4' 53".38	"	R. 199° 35' 57".37		
4th January				0 1 "		0 24 18.28	- 2 42.91	+ 11 30 61.41		54.79			
			L. 180 1	0 1 "		33 53.90	24 58.27	2 51.99		61.91		55.29	
				0 1 "		34 31.98	27 35.23	3 30.01		61.97		55.35	
				0 1 "		34 42.52	28 14.22	3 40.07		62.45		55.83	
4th January				West		R. 0 1	0 1 "	0 28 39.80		+ 3 46.79		+ 27 40 45.35	52.14
				0 1 "		37 13.92	27 32.82	3 29.40		43.32		50.11	
				0 1 "		38 8.56	24 0.87	2 39.05		47.61		54.40	
				0 1 "		38 20.72	22 58.89	2 25.63		46.35		53.14	
				0 1 "		38 55.22	19 47.94	1 48.02		43.24		50.03	
				0 1 "		39 5.58	18 55.95	1 38.76		44.34		51.13	
				0 1 "		39 43.06	15 12.01	1 3.60		46.66		53.45	
			0 1 "	39 53.84		13 35.03	0 50.78	44.62	51.41				
4th January			West	R. 9 16		0 1 "	0 11 7.58	+ 0 33.85	+ 27 40 49.35	56.14			
			0 1 "	40 7.46		12 3.57	0 39.76	47.22	54.01				
			0 1 "	39 42.50		15 45.51	1 7.82	50.32	57.11				
			0 1 "	39 30.76		16 49.49	1 17.26	48.02	54.81				
			0 1 "	38 52.06		20 31.43	1 54.85	46.91	53.70				
			0 1 "	38 39.56		21 33.42	2 6.67	46.23	53.02				
			0 1 "	37 54.94		25 20.36	2 54.80	49.74	56.53				
			0 1 "	37 31.40		26 41.34	3 13.81	45.21	52.00				
5th January			East	R. 9 16		0 1 "	0 26 56.16	- 3 17.39	+ 11 30 63.83	56.87			
			0 1 "	34 7.76		26 6.17	3 5.42	62.34	55.38				
			0 1 "	33 25.42		22 55.22	2 23.12	62.30	55.34				
		0 1 "	33 10.50	21 58.24	2 11.55	58.95	51.99						
		0 1 "	32 40.54	18 59.28	1 38.36	62.18	55.22						
		0 1 "	32 31.54	18 3.30	1 28.95	62.59	55.63						
		0 1 "	32 1.78	14 51.35	1 0.27	61.51	54.55						
		0 1 "	31 53.68	13 51.36	0 52.45	61.23	54.27						

Observations at LXXX—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Asimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1852						<i>h m s</i>	<i>' "</i>	<i>° ' "</i>		<i>"</i>		
5th January	No. 2326 B.A.C. (opp:) (Gh. Cat. 1864.)	East	R. 18 32	+11 31 20.78	Level readings insufficient	0 7 54.30	- 0 17.18	+11 30 63.60	$\pi + 8^{\circ} 4' 53''.04$	56.64	L. 199° 35' 53''.54 R. 199 35 55.88	
			L. 198 32	31 25.16		8 55.28	0 21.88	63.28		56.32		
			L. 198 32	31 50.90		13 18.21	0 48.71	62.19		55.23		
			R. 18 32	31 56.16		14 23.20	0 56.96	59.20		52.24		
			R. 18 32	32 29.20		17 52.14	1 27.94	61.26		54.30		
			L. 198 32	32 43.94		19 7.12	1 40.72	63.22		56.26		
			L. 198 32	33 27.54		23 0.06	2 25.88	61.66	54.70			
				33 42.50		24 21.04	2 43.54	58.96	52.00			
5th January	No. 2326 B.A.C. (opp:) (Gh. Cat. 1864.)	West	R. 18 33	+27 36 55.84		0 28 53.33	+ 3 50.36	+27 40 46.20	$\pi - 8^{\circ} 4' 52''.87$	53.33		L. 199° 35' 52''.02 R. 199 35 52.13
			L. 198 33	37 14.18		27 45.34	3 32.60	46.78		53.91		
			L. 198 33	38 13.52		23 35.41	2 33.47	46.99		54.12		
			R. 18 33	38 24.14		22 26.43	2 18.82	42.96		50.09		
			R. 18 33	39 6.08		18 52.48	1 38.15	44.23		51.36		
			L. 198 33	39 14.92		17 51.50	1 27.86	42.78		49.91		
			L. 198 33	39 51.44		14 5.56	0 54.66	46.10	53.23			
				39 57.16		12 58.57	0 46.34	43.50	50.63			
5th January	No. 2326 B.A.C. (opp:) (Gh. Cat. 1864.)	West	R. 27 48	+27 40 25.20		0 9 3.08	+ 0 22.41	+27 40 47.61	$\pi - 8^{\circ} 4' 52''.87$	54.74	L. 199° 35' 53''.80 R. 199 35 53.10	
			L. 207 48	40 19.20		10 3.07	0 27.63	46.83		53.96		
			L. 207 48	39 55.66		13 50.01	0 52.28	47.94		55.07		
			R. 27 48	39 41.96		15 3.99	1 2.00	43.96		51.09		
			R. 27 48	39 10.40		18 34.93	1 34.20	44.60		51.73		
			L. 207 48	38 57.94		19 47.91	1 46.91	44.85		51.98		
			L. 207 48	38 18.76		23 29.86	2 30.39	49.15	56.28			
				37 56.86		24 53.83	2 48.77	45.63	52.76			
6th January	No. 2326 B.A.C. (opp:) (Gh. Cat. 1864.)	East	R. 27 48	+11 31 58.98	0 14 9.17	- 0 54.72	+11 30 64.26	$\pi + 8^{\circ} 4' 52''.68$	56.94	L. 199° 35' 53''.31		
			L. 207 48	31 46.88	12 46.19	0 44.57	62.31		54.99			
				31 22.02	8 41.25	0 20.66	61.36		54.04			
				31 16.12	7 31.27	0 15.49	60.63		53.31			

Observations at LXXX—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1852 6th January	No. 2326 B.A.C. (opp.) (Gh. Cat 1864.)	East (contd.)	R. 27 48 L. 207 48	0 1 6.74 31 1.16 31 1.30 31 0.30	Level readings insufficient	h m s 0 3 31.33 2 36.35 0 2.39 1 57.58	l ' " - 0 3.40 0 1.86 0 0.00 0 1.05	0 1 " + 11 30 63.34 59.30 61.30 59.25	π + 8° 4' 52".68	" 56.02 51.98 53.98 51.93	R. 199° 35' 54".98

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	...	...	...	...	199 35 54.90
Do. do. do. by Western do.	...	...	...	...	...	...	...	...	199 35 53.04
Concluded do. do. by both Elongations	...	...	...	...	...	...	...	...	199 35 53.97
Angle R. M. and LXXVIII, as below ...	...	...	...	...	...	...	...	...	+ 38 24 13.13
Observed Azimuth of LXXVIII	...	...	...	...	...	...	...	...	238 0 7.10
Computed do. do. in terms of the initial value adopted at Kalfánpúr; see page 49 <sub>b</sub>	...	...	...	...	...	...	...	...	238 0 10.82
Observed—Computed Azimuth	...	...	...	...	...	...	...	...	3.72

At LXXX

January 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on R. M.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
R. M. & LXXVIII	"	"	"	"	"	"	"	"	"	"	M = 13".13
	h13.56	h13.50	h12.32	h14.30	h11.76	h13.52	h13.66	l12.72	l11.64	l14.50	w = 10.80
	h13.70	h12.06	h11.80	h14.24	h13.34	h14.02	h13.56	l13.86	l11.16	l13.30	I = 0.09
	13.63	12.78	12.06	14.27	12.55	13.77	13.61	13.29	11.40	13.90	C = 38° 24' 13".13

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XCI,

Lat. N. 25° 0' 31".53, Long. E. 69° 5' 32".50 =  $4^{\text{h}} 36^{\text{m}} 22^{\text{s}}.2 = 0.192$ , Height above mean sea level 63 feet,

observed by Mr. C. Lane

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1852													
4th February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	R. 0 1	+ 3 39 22.16	Level readings insufficient	$\begin{matrix} \text{h} & \text{m} & \text{s} \\ 0 & 13 & 28.30 \end{matrix}$	$\begin{matrix} ' & '' \\ - & 0 & 54.28 \end{matrix}$	+ 3 38 27.88	$\pi + 8^{\circ} 51' 50''.47$	"			
			L. 180 1	39 0.52		$\begin{matrix} ' & '' \\ 0 & 10 & 43.34 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 34.41 \end{matrix}$	26.11		18.35			
				38 28.46		$\begin{matrix} ' & '' \\ 2 & 0 & 50.45 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 2.42 \end{matrix}$	26.04		16.58			
				38 25.42		$\begin{matrix} ' & '' \\ 0 & 0 & 2.49 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 0.00 \end{matrix}$	25.42		16.51			
			R. 0 1	38 57.34		$\begin{matrix} ' & '' \\ 10 & 0 & 7.36 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 30.85 \end{matrix}$	26.49		15.89			
			L. 180 1	39 13.64		$\begin{matrix} ' & '' \\ 12 & 0 & 31.33 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 47.24 \end{matrix}$	26.40		16.96			
		41 6.96	$\begin{matrix} ' & '' \\ 23 & 0 & 7.18 \end{matrix}$	$\begin{matrix} ' & '' \\ 2 & 0 & 41.44 \end{matrix}$		25.52	16.87						
		42 8.24	$\begin{matrix} ' & '' \\ 27 & 0 & 9.12 \end{matrix}$	$\begin{matrix} ' & '' \\ 3 & 0 & 42.88 \end{matrix}$		25.36	15.99						
	4th February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	R. 0 2		+ 21 22 0.86	$\begin{matrix} ' & '' \\ 0 & 0 & 10.28 \end{matrix}$	$\begin{matrix} ' & '' \\ + & 0 & 0.41 \end{matrix}$		+ 21 22 1.27	$\pi - 8^{\circ} 51' 50''.32$	"	
				L. 180 2		22 0.50	$\begin{matrix} ' & '' \\ 0 & 0 & 5.29 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 0.00 \end{matrix}$		22 0.50		10.95	
						21 42.12	$\begin{matrix} ' & '' \\ 10 & 0 & 4.56 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 30.39 \end{matrix}$		22 12.51		10.18	
						21 27.68	$\begin{matrix} ' & '' \\ 11 & 0 & 54.54 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 42.43 \end{matrix}$		22 10.11		22.19	
R. 0 2				20 5.94	$\begin{matrix} ' & '' \\ 19 & 0 & 27.43 \end{matrix}$	$\begin{matrix} ' & '' \\ 1 & 0 & 52.98 \end{matrix}$	21 58.92	19.79					
L. 180 2				19 37.16	$\begin{matrix} ' & '' \\ 21 & 0 & 33.40 \end{matrix}$	$\begin{matrix} ' & '' \\ 2 & 0 & 18.58 \end{matrix}$	21 55.74	8.60					
	18 14.38	$\begin{matrix} ' & '' \\ 28 & 0 & 20.30 \end{matrix}$	$\begin{matrix} ' & '' \\ 3 & 0 & 58.93 \end{matrix}$	22 13.31	5.42								
	17 52.76	$\begin{matrix} ' & '' \\ 29 & 0 & 31.28 \end{matrix}$	$\begin{matrix} ' & '' \\ 4 & 0 & 19.16 \end{matrix}$	22 11.92	22.99								
5th February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	L. 189 16	+ 3 39 22.38	$\begin{matrix} ' & '' \\ 0 & 0 & 13.52.18 \end{matrix}$	$\begin{matrix} ' & '' \\ - & 0 & 57.52 \end{matrix}$	+ 3 38 24.86	$\pi + 8^{\circ} 51' 50''.13$	"				
			R. 9 16	39 0.34	$\begin{matrix} ' & '' \\ 11 & 0 & 4.22 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 36.68 \end{matrix}$	23.66		14.99				
				38 28.36	$\begin{matrix} ' & '' \\ 2 & 0 & 57.34 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 2.62 \end{matrix}$	25.74		13.79				
				38 21.50	$\begin{matrix} ' & '' \\ 0 & 0 & 5.38 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 0.00 \end{matrix}$	21.50		15.87				
			L. 189 16	38 52.82	$\begin{matrix} ' & '' \\ 9 & 0 & 1.49 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 24.51 \end{matrix}$	28.31		11.63				
			R. 9 16	39 6.34	$\begin{matrix} ' & '' \\ 11 & 0 & 53.45 \end{matrix}$	$\begin{matrix} ' & '' \\ 0 & 0 & 42.59 \end{matrix}$	23.75		18.44				
	40 34.04	$\begin{matrix} ' & '' \\ 20 & 0 & 45.32 \end{matrix}$	$\begin{matrix} ' & '' \\ 2 & 0 & 10.04 \end{matrix}$	24.00	13.88								
	41 8.20	$\begin{matrix} ' & '' \\ 23 & 0 & 21.29 \end{matrix}$	$\begin{matrix} ' & '' \\ 2 & 0 & 44.75 \end{matrix}$	23.45	14.13								

L. 192° 30' 16".06  
R. 192° 30' 17".19

L. 192° 30' 21".64  
R. 192° 30' 8".79

L. 192° 30' 15".27  
R. 192° 30' 13".80

Observations at XCI—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1852												
5th February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	R. 9 16	+ 21 20 5'50	Level readings insufficient	h m s	' "	° ' "	π - 8° 51' 49".97	L. 192° 30' 18".15 R. 192° 30' 14".68		
			L. 189 16	20 35'64		0 19 56'04	+ 1 59'94	+ 31 22 5'44				15'47
				21 49'46		17 11'08	1 29'07	4'71				14'74
			R. 9 16	22 7'84		8 7'20	0 19'84	9'30				19'33
			L. 189 16	21 27'82		0 16'68	0 0'02	7'86				17'89
				21 10'18		11 6'52	0 36'93	4'75				14'78
			R. 9 16	21 10'18		13 22'49	0 53'50	3'68				13'71
			L. 189 16	19 20'08		23 48'34	2 48'87	8'95				18'98
				18 40'64		26 17'30	3 25'74	6'38				16'41
			R. 18 33	+ 3 39 59'28		0 17 47'75	- 1 34'55	+ 3 38 24'73				14'51
			L. 198 33	39 33'04		15 14'78	1 9'47	23'57				13'35
				38 31'90		4 39'93	0 6'53	25'37				15'15
			R. 18 33	38 23'14		0 5'00	0 0'00	23'14	12'92			
			L. 198 33	39 16'00		13 23'81	0 54'09	21'91	11'69			
				39 42'80		16 27'76	1 21'72	21'08	10'86			
			R. 18 33	42 1'64		26 45'62	3 36'44	25'20	14'98			
			L. 198 33	42 34'74		28 52'59	4 12'17	22'57	12'35			
			R. 18 33	+ 21 21 34'64		0 10 4'86	+ 0 30'60	+ 21 21 65'24	15'61			
			L. 198 33	21 45'24		7 40'89	0 17'76	63'00	13'37			
			R. 18 33	21 59'84		0 6'00	0 0'00	59'84	10'21			
			L. 198 33	21 59'16		2 38'96	0 2'11	61'27	11'64			
			R. 18 33	21 29'16		11 6'84	0 36'97	66'13	16'50			
			L. 198 33	21 9'60		13 31'81	0 54'74	64'34	14'71			
			R. 18 33	19 41'68		21 40'69	2 20'12	61'80	12'17			
			L. 198 33	19 11'68	23 49'66	2 49'18	60'86	11'23				
			R. 18 33	+ 3 39 1'80	0 11 6'90	- 0 36'97	+ 3 38 24'83	14'27				
			L. 207 48	38 45'70	8 44'94	22'92	22'78	12'22				
			R. 27 48	38 20'60	0 0'06	0'00	20'60	10'04				
			L. 207 48	38 24'12	3 22'89	3'44	20'68	10'12				
7th February	No. 8199 B.A.C. (opp.) (B.A.C.)	East							π + 8° 51' 49".44	L. 192° 30' 13".38		
			R. 27 48									
6th February	No. 8199 B.A.C. (opp.) (B.A.C.)	West							π - 8° 51' 49".63	L. 192° 30' 15".05 R. 192° 30' 11".31		
			R. 18 33									
6th February	No. 8199 B.A.C. (opp.) (B.A.C.)	East							π + 8° 51' 49".78	L. 192° 30' 13".85 R. 192° 30' 12".60		
			R. 18 33									
6th February	No. 8199 B.A.C. (opp.) (B.A.C.)	West							π - 8° 51' 49".78	L. 192° 30' 13".85 R. 192° 30' 12".60		
			R. 18 33									





Observations at XCI—(Continued).

At XCI												
February 1852, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.												
Angle between	Circle readings, telescope being set on R. M.										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0°1'	180°1'	7°13'	187°12'	14°24'	194°24'	21°36'	201°36'	28°48'	208°48'		
R. M. & LXXXIX	"	"	"	"	"	"	"	"	"	"	"	M = 18''·87 w = 24 ·20 I w = 0 ·04 C = 54° 38' 18''·86
	h 19·74	l 18·80	l 18·00	h 18·06	h 18·50	h 19·54	l 18·68	l 17·58	h 19·78	h 19·38		
	l 17·16	l 18·92	h 18·84	h 18·28	h 18·50	h 18·82	l 19·98	l 20·24	h 19·10	h 19·42		
	l 18·36						l 19·12					
	18·42	18·86	18·42	18·17	18·50	19·18	19·33	18·98	19·44	19·40		

Observations at XCV,

Lat. N. 24° 49' 31"·23, Long. E. 68° 46' 14"·56 = <sup>h</sup> 4 <sup>m</sup> 35 <sup>s</sup> 5·0 = 0·191, Height above mean sea level 67 feet,

observed by Captain A. Strange and Lieutenant J. F. Tennant

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1852			o ' "	o ' "		h m s	' "	o ' "		"	
23rd December	δ Ur. Min. (conj:) (N.A.)	West	R. o 1	+ 2 20 13·84 20 15·04	Level readings insufficient.	o 1 50·60 o 21·63	+ o 0·44 o 0·02	+ 2 20 14·28 15·06	π - 3° 44' 52"·26	22·02 22·80	L. 178° 35' 21"·99
			L. 180 1	20 11·56 20 10·04		4 44·28 6 0·26	2·88 4·62	14·44 14·66		22·18 22·40	



Observations at XCI—(Continued).

At XCI											
February 1852, observed by Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on R. M.										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0°1'	180°1'	7°13'	187°12'	14°24'	194°24'	21°36'	201°36'	28°48'	208°48'	
R. M. & LXXXIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 18''·87 <i>w</i> = 24 ·20 $\frac{1}{w}$ = 0 ·04 <i>C</i> = 54° 38' 18''·86
	<i>h</i> 19·74	<i>l</i> 18·80	<i>l</i> 18·00	<i>h</i> 18·06	<i>h</i> 18·50	<i>h</i> 19·54	<i>l</i> 18·68	<i>l</i> 17·58	<i>h</i> 19·78	<i>h</i> 19·38	
	<i>l</i> 17·16	<i>l</i> 18·92	<i>h</i> 18·84	<i>h</i> 18·28	<i>h</i> 18·50	<i>h</i> 18·82	<i>l</i> 19·98	<i>l</i> 20·24	<i>h</i> 19·10	<i>h</i> 19·42	
	<i>l</i> 18·36						<i>l</i> 19·12				
	18·42	18·86	18·42	18·17	18·50	19·18	19·33	18·98	19·44	19·40	

Observations at XCV,

Lat. N. 24° 49' 31"·23, Long. E. 68° 46' 14"·56 =  $4^{\text{h}} 35^{\text{m}} 5^{\text{s}} \cdot 0 = 0^{\text{d}} \cdot 191$ , Height above mean sea level 67 feet,

observed by Captain A. Strange and Lieutenant J. F. Tennant

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1852	δ Ur. Min. (conj:) (N.A.)	West	R. 0 1	0 1 "	Level readings insufficient.	<i>h m s</i>	<i>' "</i>	<i>o ' "</i>	π - 3° 44' 52"·26	"	L. 178° 35' 21"·99
+ 2 20 13·84				0 1 50·60		+ 0 0·44	+ 2 20 14·28	22·02			
20 15·04				0 21·63		0·02	15·06	22·80			
20 11·56				4 44·28		2·88	14·44	22·18			
L. 180 1	20 10·04	6 0·26	4·62	14·66	22·40						

Observations at XCV—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1859 23rd December	δ Ur. Min. (conj.) (N.A.)	West (contd.)	R. 0 1	+ 2 19 57.54	Level readings insufficient	h m s	' "	° ' "	π - 3° 44' 52".26	R. 178° 35' 21".27	
			L. 180 1	19 53.00		0 10 29.18	+ 0 14.07	+ 2 20 11.61			19.35
			19 33.32	12 33.15		20.16	13.16	20.90			
			19 24.76	18 2.05		41.57	14.89	22.63			
				19 26.03		48.27	13.03	20.77			
23rd December	δ Ursæ Minoris (conj.) (N.A.)	East	R. 0 1	- 5 8 44.54		0 18 55.47	- 0 45.77	- 5 9 30.31			22.12
			L. 180 1	8 54.18		16 29.52	34.78	28.96			23.47
			9 17.10	10 12.63		13.34	30.44	21.99			
			9 20.28	8 51.65		10.05	30.33	22.10			
			9 27.36	3 47.74		1.85	29.21	23.22			
			9 27.90	2 17.77		0.68	28.58	23.85			
				1 12.17		0.19	29.93	22.50			
			R. 0 1	9 29.74		2 45.15	0.97	30.81			21.62
				9 29.84							
24th December	δ Ursæ Minoris (conj.) (N.A.)	West	L. 189 16	+ 2 19 47.70		0 14 27.53	+ 0 26.83	+ 2 20 14.53			21.94
			R. 9 16	19 49.04		12 44.56	20.84	9.88			17.29
				20 7.98		8 18.64	8.86	16.84			24.25
				20 6.54		7 21.66	6.95	13.49			20.90
			L. 189 16	20 14.04		0 38.77	0.05	14.09			21.50
				20 9.68		1 26.19	0.26	9.94			17.35
			R. 9 16	20 10.48		7 1.09	6.31	16.79			24.20
				20 3.66		8 26.07	9.11	12.77			20.18
25th December	δ Ursæ Minoris (conj.) (N.A.)	West	R. 18 32	+ 2 19 50.28		0 13 41.25	+ 0 24.05	+ 2 20 14.33			21.30
			L. 198 32	19 53.36		12 26.27	19.85	13.21			20.18
				20 10.14	6 44.37	5.83	15.97	22.94			
				20 8.70	5 25.39	3.77	12.47	19.44			
			R. 18 32	20 13.24	0 43.47	0.07	13.31	20.28			
				20 13.72	0 40.50	0.06	13.78	20.75			
			L. 198 32	20 11.46	6 8.41	4.83	16.29	23.26			
				20 7.90	7 23.38	6.99	14.89	21.86			



PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XCV—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1852	δ Ur. Min. (conj.) (N.A.)	East (contd.)	R. 9 17	0 5 9 22.68	Level readings insufficient	h m s	' "	0 5 9 30.03	π + 3° 44' 53".97	"	R. 178° 35' 22".80
L. 189 17			9 20.56	0 7 34.05		7 35	30.69	23.94			
			9 3.04	8 53.03		10.13	32.63	23.28			
			8 56.44	15 10.92		29.59	32.63	21.34			
27th December						15 30.91	30.90	27.34		26.63	

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	178 35 22.44
Do. do. do. by Western do.	...	...	...	...	178 35 21.21
Concluded do. do. by both Elongations	...	...	...	...	178 35 21.83
Angle XCVI and R. M. as below	...	...	...	...	- 4 6 38.80
Observed Azimuth of XCVI	...	...	...	...	174 28 43.03
Computed do. do. in terms of the initial value adopted at Kaliánpur; see page 50—b	...	...	...	...	174 28 40.96
Observed—Computed Azimuth	...	...	...	...	+ 2.07

At XCV

December 1852, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on XCVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	355°54'	175°55'	3°5'	183°6'	10°18'	190°18'	17°30'	197°30'	24°42'	204°42'	
XCVI & R. M.	h38.76	h38.78	l43.00	l39.74	h39.82	h39.22	l38.36	l39.48	h39.40	h35.88	M = 38".79 w = 3.92 1/w = 0.26 C = 4° 6' 38".80
	h38.64	h38.84	l39.58	l39.88	h38.42	h35.98	l38.54	l38.98	h37.82	h35.28	
			l42.12			h38.88					
	38.70	38.81	41.57	39.81	39.12	38.03	38.45	39.23	38.61	35.58	



Observations at CIV—(Continued).

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1853												
17th February	No. 3495 B.A.C. (opp.) (B.A.C.)	East	R. 27 48	+21 51 36.80	Level readings insufficient	h m s	' "	° ' "	π + 5° 31' 13".86	"	L. 207° 22' 29".57 R. 207° 22' 27".54	
		L. 207 48	51 42.12	0 11 2.8		- 0 23.02	+21 51 13.78	27.64				
			52 6.38	12 15.8		0 28.38	13.74	27.60				
			52 12.28	16 12.7		0 49.63	16.75	30.61				
			52 38.28	17 14.7		0 56.16	16.12	29.98				
			52 44.62	20 49.7		1 21.95	16.33	30.19				
		R. 27 48	53 23.40	21 56.6		1 30.98	13.64	27.50				
			53 36.68	26 14.6		2 10.18	13.22	27.08				
				27 28.6		2 22.72	13.96	27.82				
17th February	No. 3495 B.A.C. (opp.) (B.A.C.)	West	R. 27 48	+32 50 43.40		Level readings insufficient				π - 5° 31' 13".69	"	L. 207° 22' 25".81 R. 207° 22' 25".00
		L. 207 48	50 59.70	0 30 22.3			+ 2 54.43	+32 53 37.83	24.14			
			51 41.10	29 12.3			2 41.27	40.97	27.28			
			51 53.96	25 3.4	1 58.66		39.76	26.07				
			52 26.74	23 37.4	1 45.46		39.42	25.73				
			52 34.58	19 43.5	1 13.50		40.24	26.55				
		R. 27 48	53 1.46	18 24.5	1 4.00		38.58	24.89				
			53 7.50	13 53.6	0 36.43		37.89	24.20				
				12 43.6	0 30.56		38.06	24.37				
17th February	No. 3495 B.A.C. (opp.) (B.A.C.)	West	R. 18 32	+32 53 26.16	Level readings insufficient					π - 5° 31' 13".69	"	L. 207° 22' 26".54 R. 207° 22' 25".99
		L. 198 32	53 18.28	0 9 0.1			+ 0 15.24	+32 53 41.40	27.71			
			52 55.92	10 13.0			0 19.62	37.90	24.21			
			52 28.08	14 21.0		0 38.68	40.76	27.07				
			52 20.22	15 27.9		0 44.91	40.83	27.14				
			51 30.06	19 31.9		1 11.57	39.65	25.96				
		R. 18 32	51 28.52	20 34.9		1 19.44	39.66	25.97				
				25 59.8		2 6.57	36.63	22.94				
				26 46.8		2 14.28	42.80	29.11				
18th February	No. 3495 B.A.C. (opp.) (B.A.C.)	West	R. 9 16	+32 50 47.98		Level readings insufficient				π - 5° 31' 13".34	"	L. 207° 22' 27".72
		L. 189 16	51 4.00	0 29 58.0			+ 2 49.79	+32 53 37.77	24.43			
			51 42.48	28 39.0			2 35.19	39.19	25.85			
			51 50.54	25 10.1	1 59.72		42.20	28.86				
				24 8.1	1 50.08	40.62	27.28					





PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at CIV—(Continued).

<i>At CIV</i>											
<i>February 1853, observed by Captain A. Strange with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	274° 16'	94° 16'	281° 27'	101° 27'	288° 39'	108° 39'	295° 51'	115° 51'	303° 3'	123° 3'	
CVI & R. M.	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "	<i>M</i> = 30° 55 <i>w</i> = 16.90 $\frac{1}{w}$ = 0.06 <i>C</i> = 85° 45' 30" 55
	h30° 00	h31° 26	l30° 32	l30° 50	l32° 66	l29° 20	h31° 04	h30° 90	h30° 24	h30° 08	
	h30° 60	h31° 44	l30° 52	l30° 12	l30° 16	l28° 86	h31° 06	h31° 10	h30° 54	h30° 32	
	30° 30	31° 35	30° 42	30° 31	31° 41	29° 03	31° 05	31° 00	30° 39	30° 20	

J. B. N. HENNESSEY.

Fig. No. 11

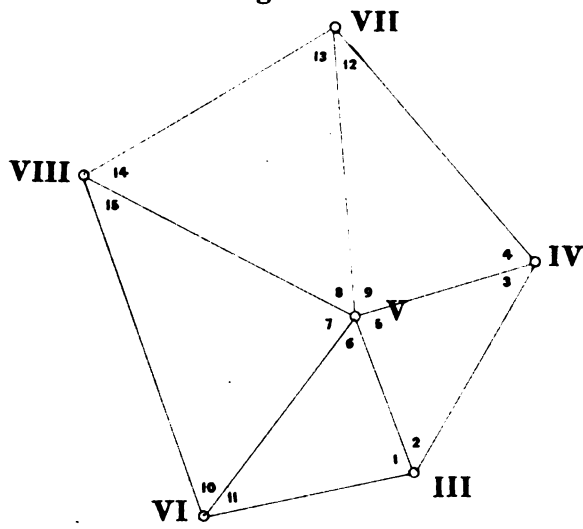


Fig. No. 10

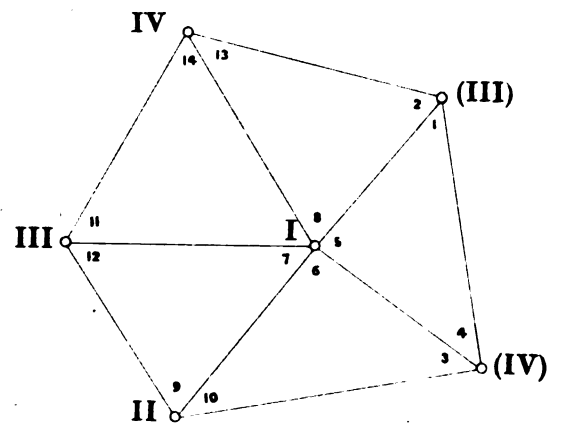
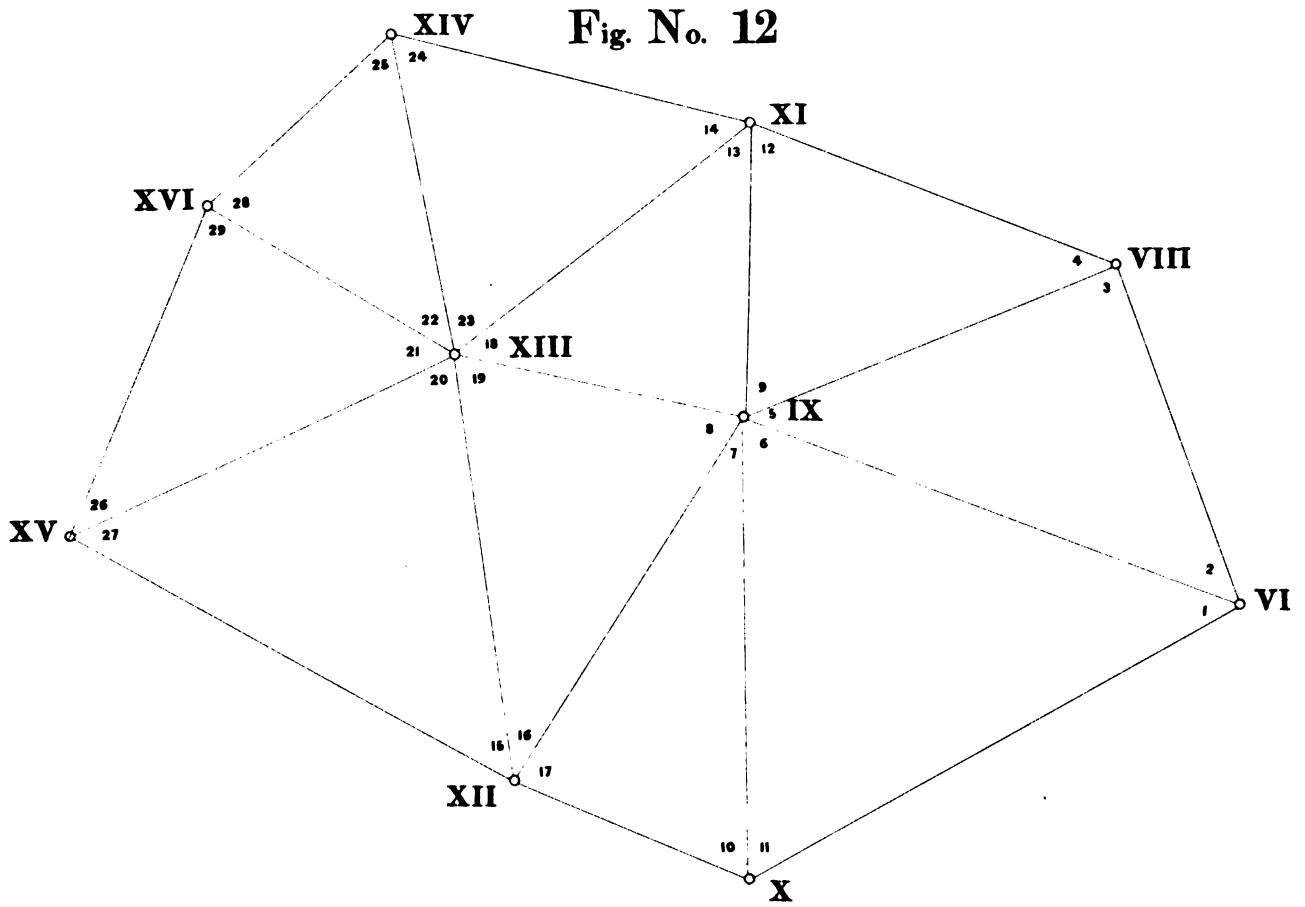


Fig. No. 12



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



Fig. No. 14

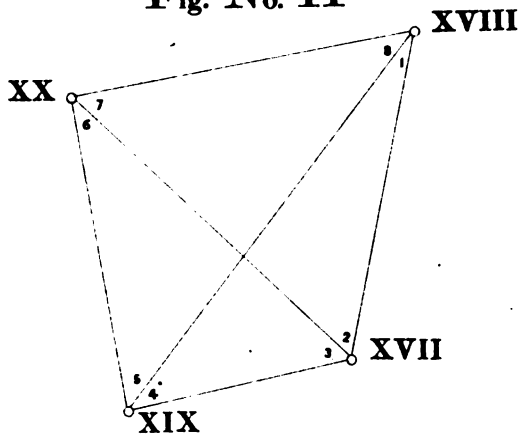


Fig. No. 13

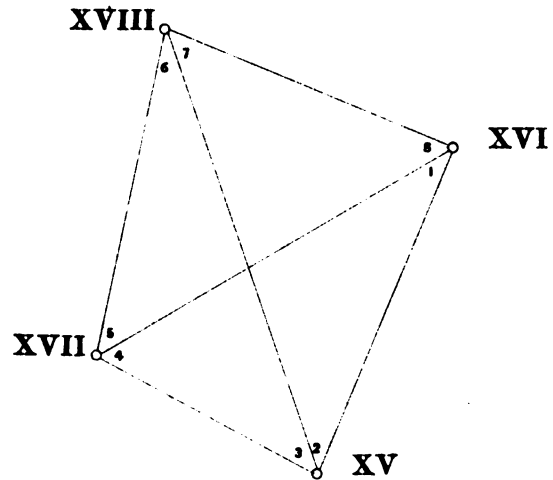


Fig. No. 16

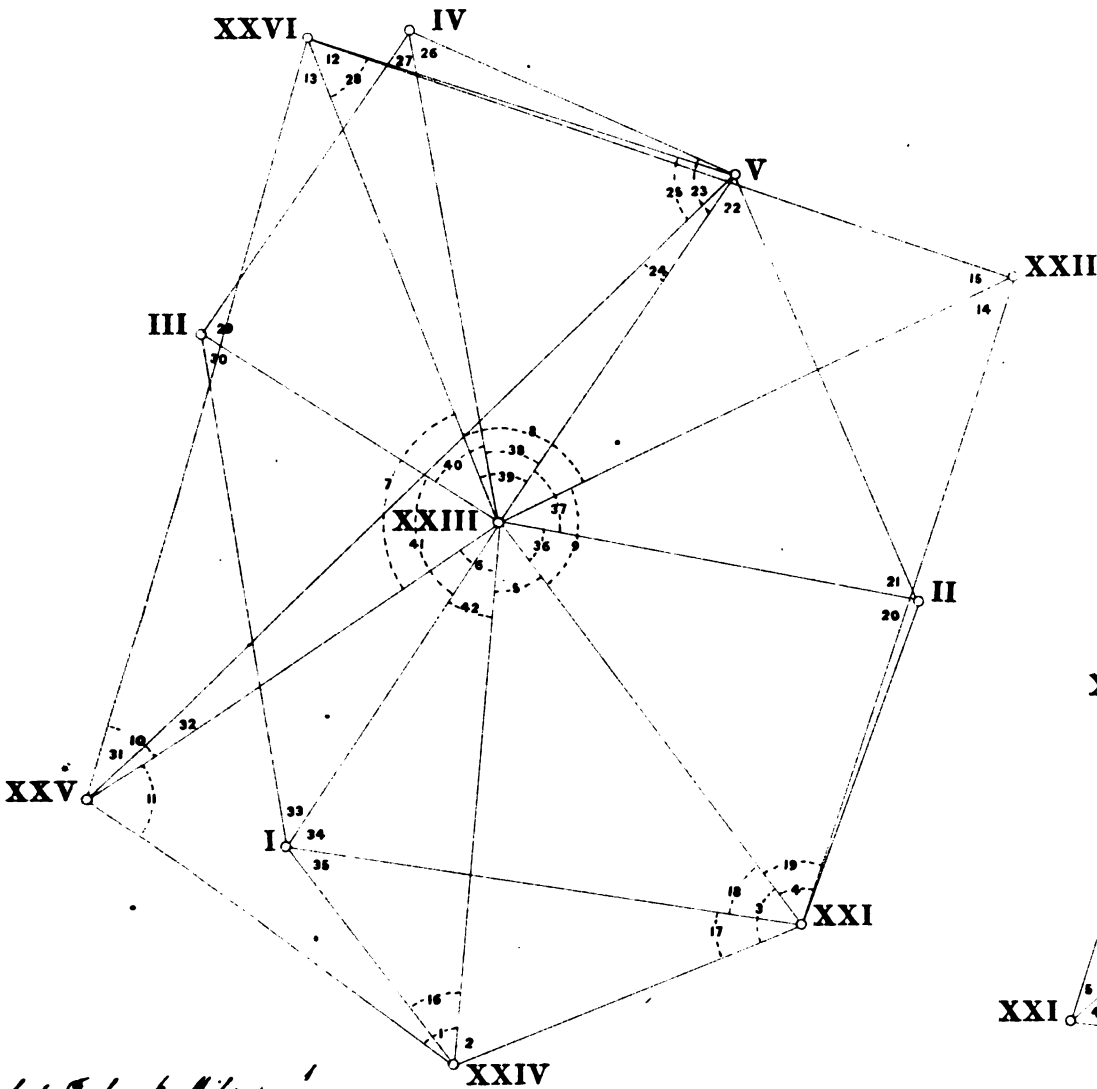
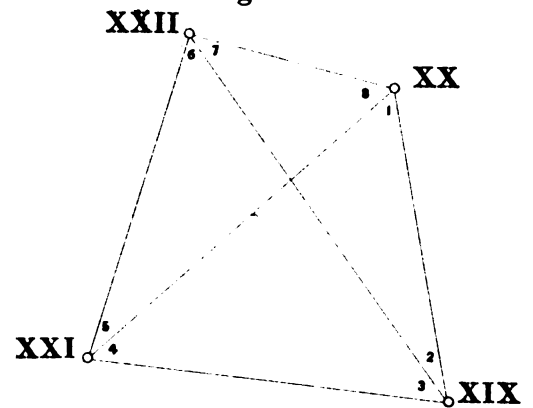


Fig. No. 15



Scale 1 Inch = 6 Miles or  $\frac{1}{380160}$

NOTE—STATIONS I TO V PERTAIN TO THE GUERAGARE MERIDIONAL SERIES.

Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$

For Figs. 13, 14 and 15



Fig. No. 18

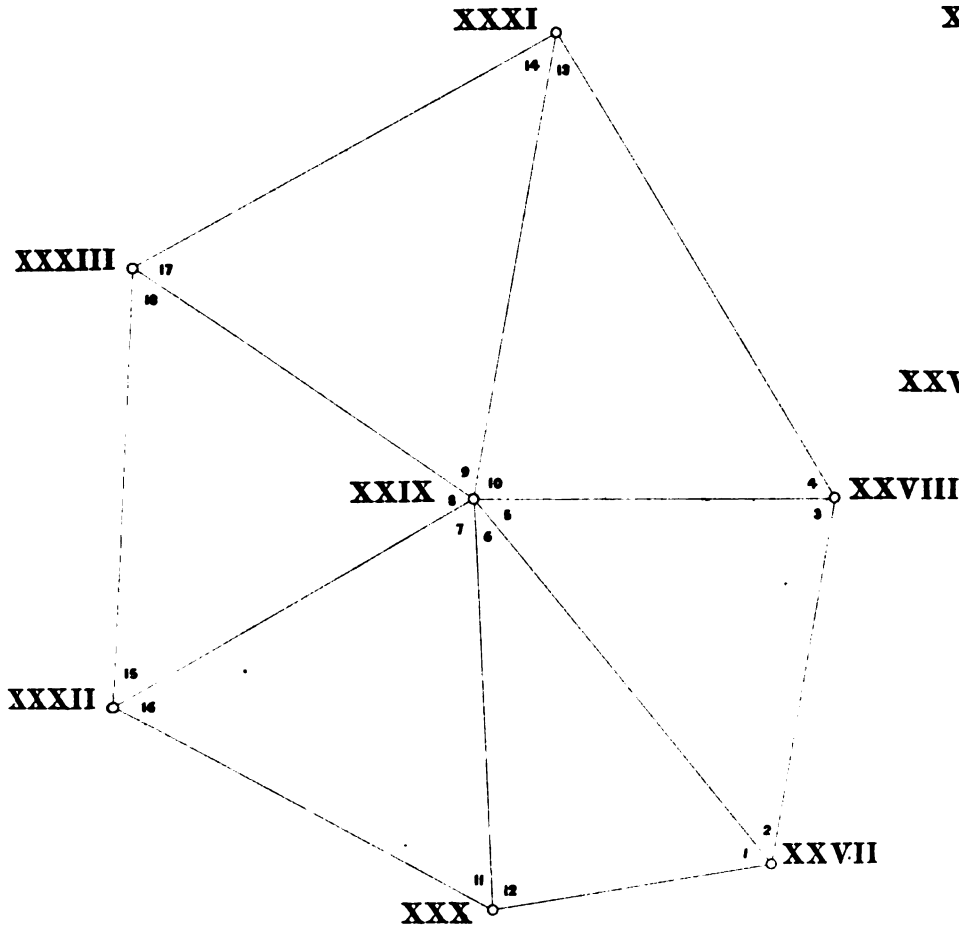


Fig. No. 17

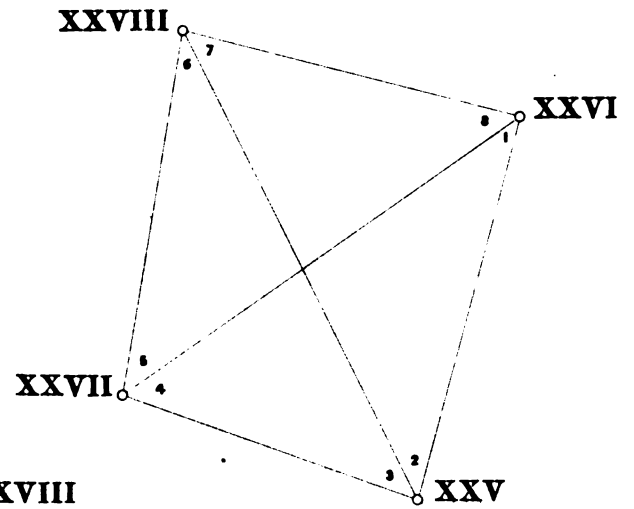
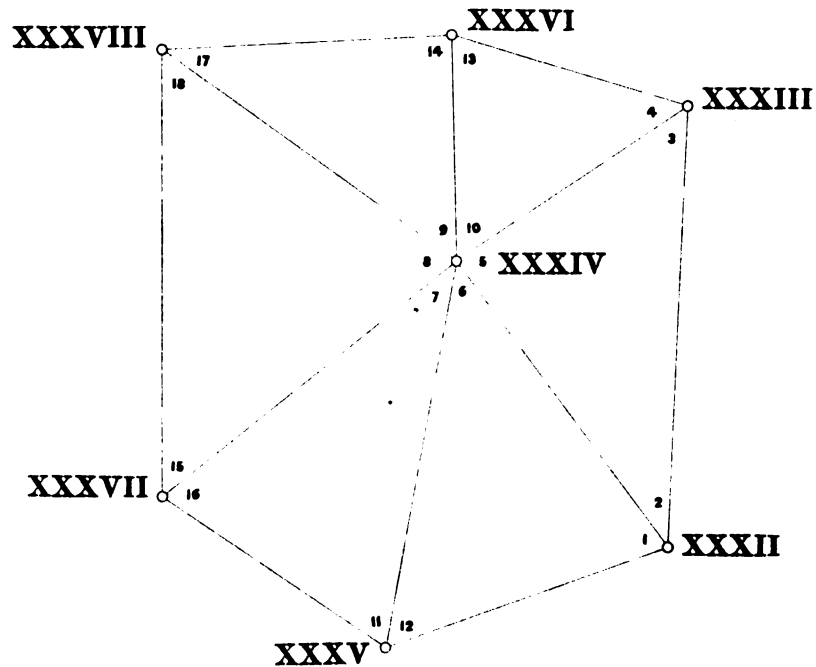


Fig. No. 19



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$





Fig. No. 20

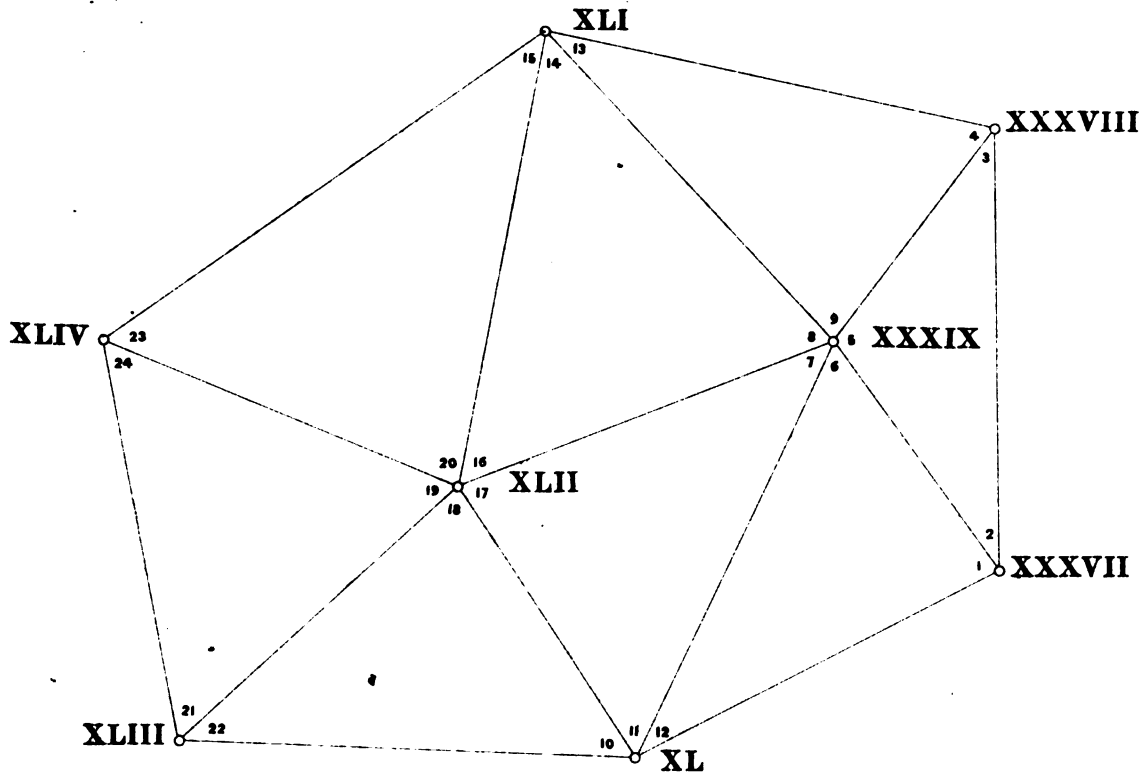


Fig. No. 22

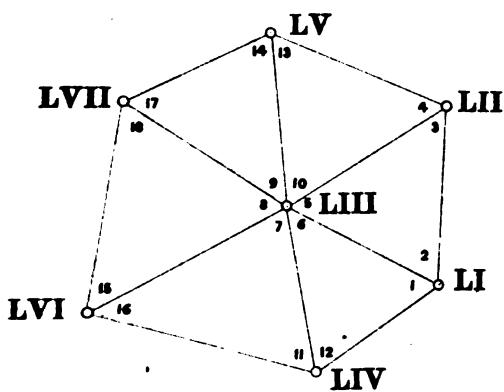
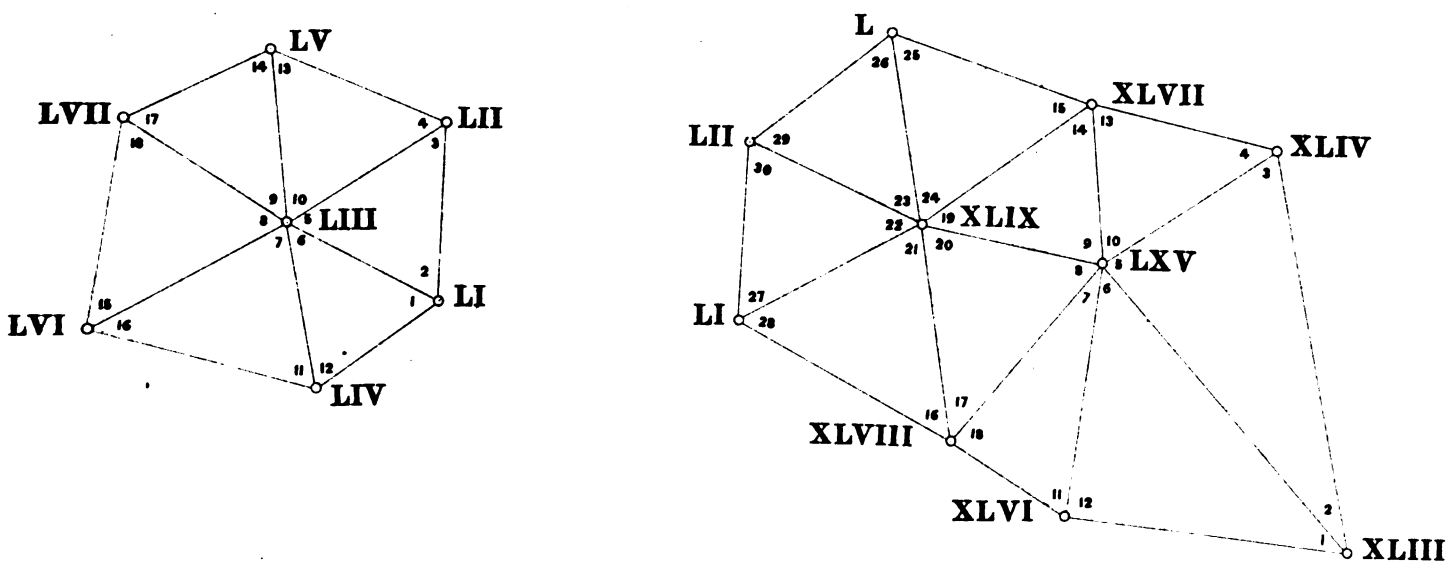


Fig. No. 21



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



Fig. No. 24

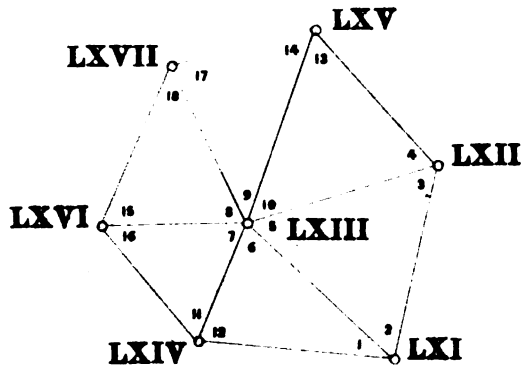


Fig. No. 23

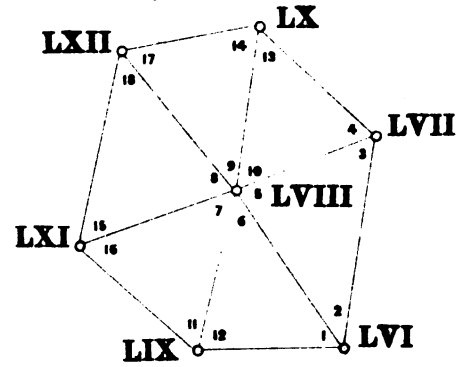


Fig. No. 26

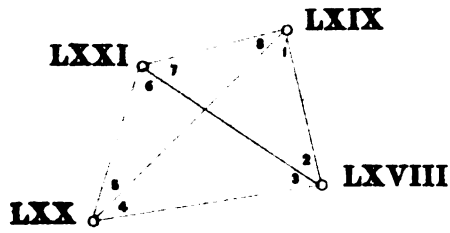


Fig. No. 25

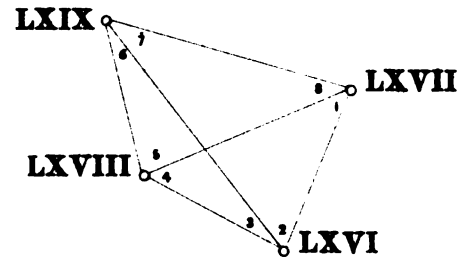


Fig. No. 28

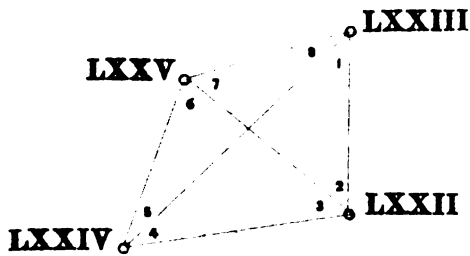
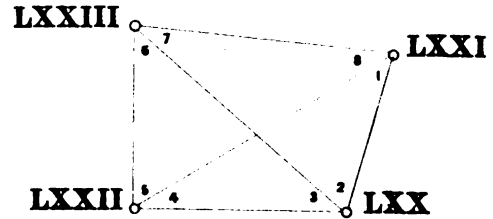


Fig. No. 27



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



Fig. No. 30

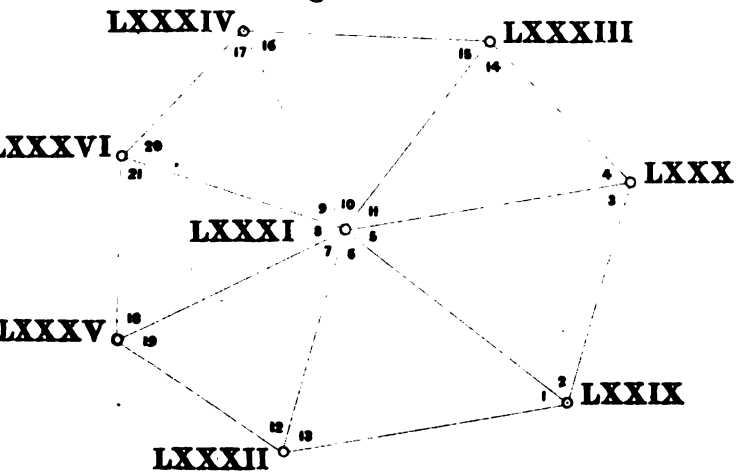


Fig. No. 29

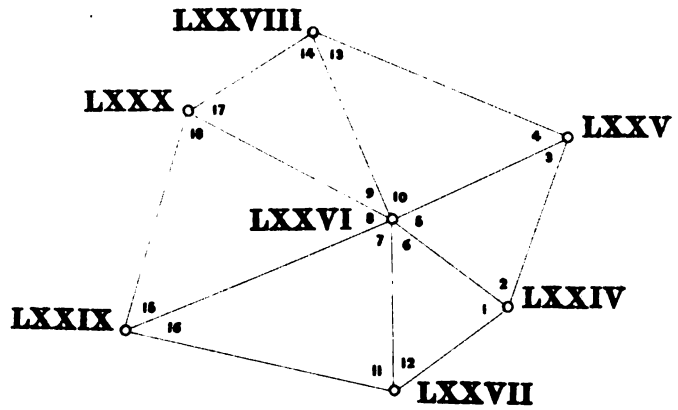


Fig. No. 32

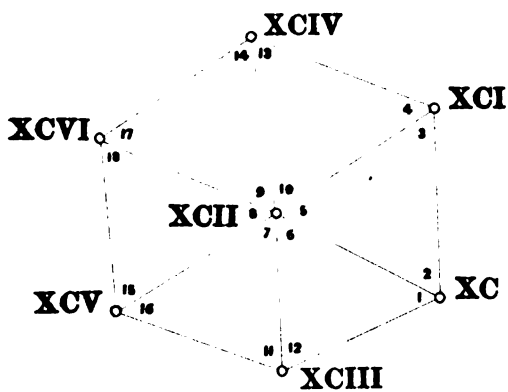
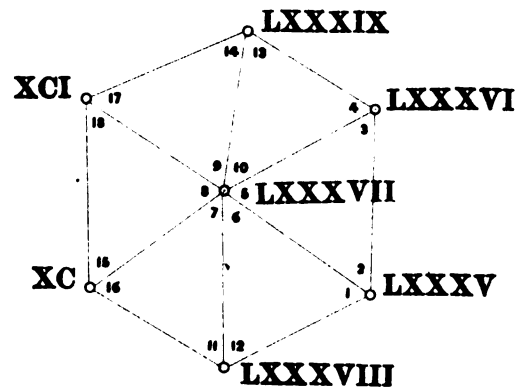


Fig. No. 31



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



Fig. No. 34

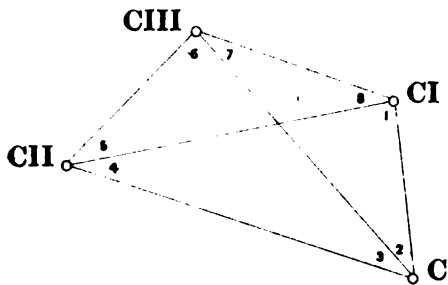


Fig. No. 33

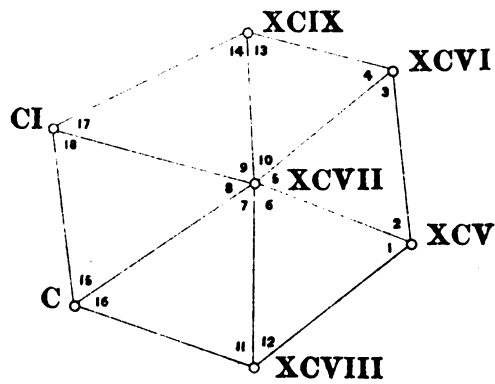


Fig. No. 36

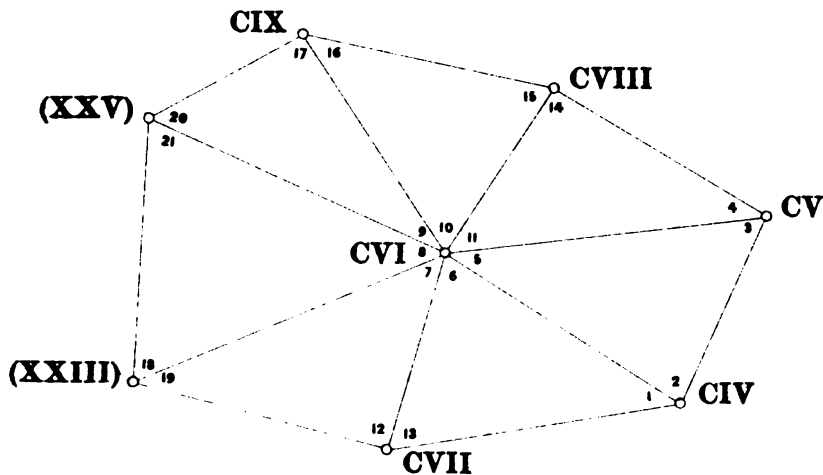
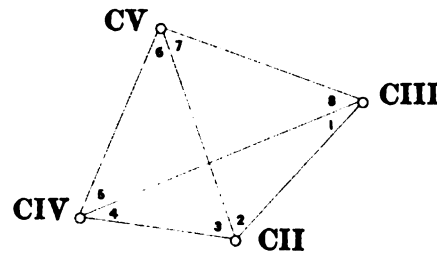


Fig. No. 35

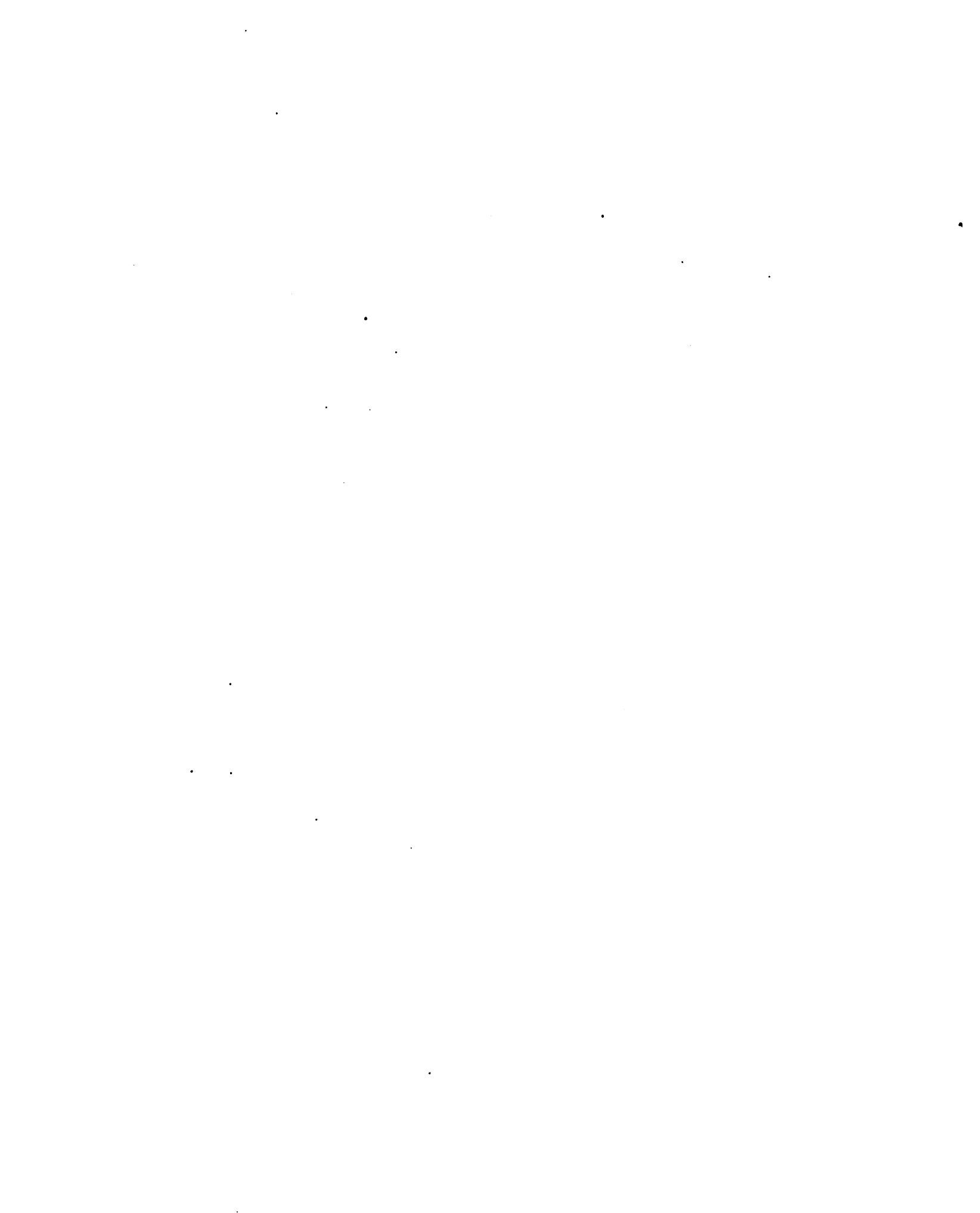


Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$





**NORTH-WEST HIMALAYA SERIES.**



**NORTH-WEST HIMALAYA SERIES.**



## NORTH-WEST HIMALAYA SERIES.

### INTRODUCTION.

In 1846, the whole of the trigonometrical survey parties were concentrated in the tract of country between Allahabad and Calcutta, according to the orders of the Hon'ble Court of Directors, who were desirous that this portion of the Triangulation of India should be finished as speedily as possible, with a view to the completion of the sheets of the Atlas, comprising the Bengal provinces. Lieut. Colonel Waugh's original scheme contemplated the transference of these parties, as their work in Bengal approached completion, to the country west of the meridian of the Great Arc; but the political changes that had lately taken place in the north-west of India, by the conquest of Sind and annexations in the Panjáb, necessitated a change of plans.

At the end of 1845, when the Sikh army crossed the Sutlej and invaded British territory, the Governor-General issued a proclamation confiscating all the districts belonging to the Sikh crown south of the Sutlej. In March 1846, after the issue of the first Sikh war, the Jalandar doab, or district lying between the Sutlej and Beas rivers, was annexed. The province of Kashmir and the highlands of Jammu were also taken over, in lieu of payment for the expenses of the campaign, a demand which the Lahore state was unable to meet: these two provinces were then sold to Golab Sing, the Rajah of Jammu, who was constituted the independent sovereign of Kashmir and Jammu. After this settlement of the Panjáb, the extension of trigonometrical operations in that quarter became of primary importance, as they were especially required to furnish an accurate basis for the minor surveys which had been entered on in the newly acquired provinces. Towards the end of 1846, therefore, Lieut. Colonel Waugh received orders from the Government to arrange for the triangulation of the north-west portion of India, and to extend it as far as British influence would admit, *viz.*, over Kashmir, Pesháwar, the valley of the Indus, and finally to Karáchi on the sea coast, connecting Sind with Bombay. With this object in view, Lieut. Colonel Waugh designed to include the north-west quarter of the British Indian dominions within four great series, forming a great quadrilateral figure, *viz.*, the Great Arc Series on the east, the North-West Himalaya Series on the north, the Indus Series on the west, and the Karáchi Longitudinal Series on the south; each of these principal series to be measured with the largest class of instruments, and to depend on measured bases at each extremity.

The North-West Himalaya Series, which forms the northern side of this great quadrilateral figure, was executed during the years 1847 to 1852. It emanates from a side of the Great Arc Series, which is immediately connected with the Dehra Dún base-line, and conforms to the southern face of the Sub-Himalayan range, passing through the native states of Sirmúr Náhan and Bilaspur into Kángra and Hoshiarpur, and thence through Jammu into the Jhilam and Ráwal Pindi districts, terminating in the valley of Chach, near Attock.

The series was commenced by Captain J. S. DuVernet, of the Madras Infantry, who was selected by Lieut. Colonel Waugh for this enterprise on account of his long experience in the department, and also for the reason that his party would start with the advantage of previous experience in a mountainous country, having been formerly employed in the triangulation from Landour to Almora, which was the only work that had been executed at all analogous to the contemplated operations. The chief difficulties which were anticipated in conducting the North-West Himalaya Series, were those likely to arise from the lofty and rugged character of the mountains, in which the transport of heavy, unwieldy instruments would be an arduous and risky undertaking. On this consideration it was decided that the great 36-inch theodolite was not adapted for service in such ground, and Captain DuVernet was therefore equipped with a 24-inch theodolite which was used throughout the series.

Captain DuVernet having organised a party suited to the mountain operations, com-

Season 1847-48.

PERSONNEL.

Captain J. S. DuVernet, Madras Infantry, 1st Asst.  
 Mr. J. Mulheran, Senior 1st Class Sub-Assistant.  
 „ O. Mulheran, Junior do.  
 „ C. A. Olliver, 2nd Class Sub-Assistant.  
 „ F. C. Blewitt, do.  
 „ J. Dyer, 3rd Class Sub-Assistant.  
 „ B. W. Pierce, do.  
 „ C. H. Burt, do.

menced work in November 1847, from the side of the Great Arc, Amsot to Banog near the Jumna, and during the season carried the triangulation as far as the Sutlej, to the stations of Baráol and Nainadevi, extending over a direct distance of 105 miles, by a double series comprising 19 principal triangles. In connection with this, about four hundred secondary triangles were laid down,

fixing the positions of the most remarkable mountain peaks (with their heights above the level of the sea) and the chief towns and villages. A military sketch was also drawn, on a scale of 4 miles to an inch, exhibiting the topographical features of the country, which afforded useful information regarding a tract of which our geographical knowledge was hitherto very limited and uncertain. Captain J. Halpin, of the Madras Infantry, who was in charge of the Ganjam Topographical Survey, was posted to this party as a temporary measure, to acquire a knowledge of the method in which the operations of the G. T. Survey were conducted, and accompanied Captain DuVernet throughout the season. In March 1848, Captain A. Strange, of the Madras Cavalry, who had recently been appointed to the department, was also attached to this series to learn his duties. The Surveyor-General, who had been engaged during this field season in superintending the measurement of the Sonakhoda base-line in the Purneah district, proceeded in the spring to the North-West Provinces and inspected Captain DuVernet's party in May 1848.

Towards the middle of the year 1848, the political aspect of affairs in the Panjáb was so threatening, as to render the prospect of continued tranquillity a matter of great improbability. As Captain DuVernet's operations were to enter at once into the Kohistan of

Jalandar, which was a recent acquisition from the Sikhs, it was questionable whether the safety of the party might not be compromised by their being employed so near the scene of impending war: even if there was no immediate danger, it was felt that as survey operations are always regarded with suspicion in new states, they might be considered ill-timed. Lieut. Colonel Waugh therefore referred the question to the political authorities and on being informed that no danger was apprehended, he prepared Captain DuVernet's party to resume work.

Captain DuVernet left Dehra in the beginning of October to extend his operations from

Season 1848-49.

PERSONNEL.

Capt. J. S. DuVernet, Madras Infantry, 1st Asst.  
 Mr. H. Keelan, Senior 1st class Sub-Assistant.  
 „ J. Mulheran, do.  
 „ C. A. Olliver, 2nd class Sub-Assistant.  
 „ J. C. Blewitt, do.  
 „ J. Dyer, 3rd class Sub-Assistant.  
 „ C. H. Burt, do.  
 „ C. J. Carty, do.  
 „ W. H. Johnson, do.  
 „ H. B. Talbot, do.

the Sutlej where he had closed work the previous season, into the Jalandar doab. In the mean time, the whole of the Panjáb was in a state of revolt, and preparations were being made to prosecute a general Panjáb war. Captain DuVernet had made but small progress in his work, when an insurrection broke out in the valley of the Sohan, or Jaswan Dún, in the Hoshiarpur district, which drove the whole party from the field. Captain DuVernet, with the main camp and large theo-

dolite, narrowly escaped capture and retreated to Kalka. Mr. C. Olliver however was less fortunate: while encamped at the village of Ambota, he was suddenly attacked by a body of rebels who plundered his property and took him and his escort prisoners. Several of the Native Establishment were plundered and maltreated, and a 12-inch theodolite and some other instruments destroyed. Mr. Olliver was marched off, bound as a prisoner, to the Rajah at Amb, and after undergoing considerable privations during a captivity of eight days, was eventually released by a detachment of the 29th Native Infantry, from whose fire he had a narrow escape. After these adventures he returned to head quarters, and ultimately received compensation from Government to the extent of Rs. 800 for the loss of his equipment.

The rebellion having been quelled, the party took the field again on the 20th January. Captain DuVernet commenced the measurement of the principal angles in February, and at the close of the season had completed two polygonal figures, comprising 12 triangles, extending over a distance of 75 miles and terminating at the stations of Darot and Lipiána on the Beas. The delay occasioned by the insurrection greatly retarded Captain DuVernet's operations, which might have been extended as far as the Ravi, but for this untoward event. In connection with the principal triangulation, minor series were extended eastward to Mandi, westward to Amballa, and also along the banks of the Sutlej and Beas rivers. The number of triangles connected with these secondary operations amounted to 854, by means of which the positions of numerous towns and remarkable places were accurately determined, and the topographical features of the country delineated by means of plane-table surveys, on the scale of 4 miles to an inch.

The Sutlej and Beas minor triangulation was executed by Mr. Keelan, with a 12-inch theodolite. It commences at Rugar, situated on the left bank of the Sutlej, a short distance below its efflux from the Himalayas, and is carried along the banks of that river up to its junction with the Beas, when it trends north-eastwards up the latter river. Mr. Keelan com-

menced the triangulation on the 1st February and by the middle of May had extended it over a distance of about 115 miles: it comprises 53 triangles, from which numerous towns and remarkable places were fixed, including Ludhiána, Phillur, Kapúrthala and Kartárpur.

The Amballa and Sirhind minor series was executed by Mr. J. Mulheran, with a 12-inch theodolite. The triangulation was commenced at Amballa and carried westward as far as Patiála, whence it was taken northwards to connect Sirhind. It comprises 45 triangles, and extends over a distance of 46 miles. This work was completed in the beginning of March, when Mr. Mulheran commenced a minor triangulation in the hills from the stations of Báradevi and Nainadevi, on the northern flank of the main series, and carried it through Bilaspur to Mandi. This undertaking was accomplished by the beginning of May and consists of observations at 23 stations, forming a network of triangles, covering a direct distance of 36 miles.

Mr. Olliver selected the principal stations of the series as far as the Ravi; Mr. Blewitt built the platforms thereat and constructed roads up to them: Messrs. Dyer, Talbot and Carty were employed in making route surveys and in filling in the topographical details of the country traversed by the triangulation.

Captain DuVernet took the field again in October. The station of Darot, where the

Season 1849-50.

PERSONNEL.

Captain J. S. Du Vernet, Madras Infantry, 1st Asst.  
 Mr. H. Keelan, Senior 1st Class Sub-Assistant.  
 „ J. Mulheran, do.  
 „ C. A. Olliver, Junior do.  
 „ F. C. Blewitt, 2nd Class Sub-Assistant.  
 „ J. Dyer, do.  
 „ W. H. Johnson, 3rd Class Sub-Assistant  
 „ H. B. Talbot, do.  
 „ E. Dyer, do.  
 „ C. A. Summers, Sub-Asst. Topogrl. Surveyor.

observations had been suspended last season, was unfortunately found to have been injudiciously chosen, as it commanded no view to the north-west, in consequence of which the triangulation could not be extended from it. This necessitated the rejection of Darot station as well as Chimohi, and a new polygon was formed round Tipri, whereby some portion of the former season's work had to be repeated and the advance of the series

was considerably retarded. Towards the close of the season, umbrage was taken by the Maharajah of Kashmir, into whose territory the operations had now entered, at the occupation of the mountain of Trikuta for a survey station, on the grounds of its being sacred. The objection appears to have arisen from a misconception of localities, as the summit of the mountain, which is about 9,000 feet above the sea, is situated fully eight miles from the sacred temple; but as the President of the Board of Administration of the Panjáb took an unfavourable view of the case, it was found necessary to abandon Trikuta as a principal station. This untoward event occurring at a very critical period, arrested the progress of the work, and brought the operations of the season to an untimely close. Notwithstanding these drawbacks, a good amount of work was performed. An azimuth of verification was measured at the station of Koti; the principal triangulation was extended in a direct distance 72 miles, by 17 triangles, from the Beas to the stations of Sámnabanj and Gurhágárh, in the vicinity of Jammu. Stations were also selected to a distance of 50 miles in advance of this side by Mr. Olliver, but this part of the work proved useless, in consequence of the prohibition to make use of the Trikuta mountain. Connected with the principal triangulation, 53 1st class and 50 minor triangles were laid down, fixing the positions of many important towns and remarkable mountain peaks.



Mr. Keelan had been temporarily transferred from this party at the commencement of the field season, and was employed in assisting in a route survey, carried on by the Surveyor General, through the Panjáb to Pesháwar. He rejoined Captain DuVernet in March 1850, when he resumed operations on the Beas minor triangulation and completed it in about a month, by 13 additional triangles, measured with a 14-inch theodolite. This series terminates on the side Koti-Dinaládh of the principal triangulation.

Mr. J. Mulheran distinguished himself by his zeal and ability in surveying the difficult mountainous country between Kángra, Nidaon and Mandi. His season's work consisted of a net work of 55 minor triangles and 95 secondary triangles, measured with a 14-inch theodolite, on which is based a complete detail survey, on the scale of 2 miles to an inch, comprising an area of 1800 square miles.

In consequence of a requisition from the civil authorities, it became necessary to take up the delineation of boundaries: this involved the revision of the detail on the Sutlej, in the vicinity of Bilaspur, Anandpur and Una. The detail survey was extended on the same principle over the Kángra, Nidaon and Mandi triangulation, the extent of country conjointly surveyed by Messrs. Mulheran and J. Dyer embracing an area of 4,100 square miles. All the route surveys of roads bordering on the hills in the Cis and Trans-Sutlej states were completed. Part of the old mountain road from Masúri to Simla was surveyed in detail by Messrs. J. Dyer and Talbot, but the work in the neighbourhood of Simla was not finished, as the further prosecution of operations in that part of the hills was prevented by some of the party getting into a dispute with the villagers of Kadi: this involved the whole detachment in proceedings in the Law Court, which detained them from their duties during the best part of the season.

It will be observed that the progress of the principal triangulation had been retarded by two unavoidable causes, *viz.*, the insurrection in the Jaswan Dún in November 1848, and the necessity of giving up a principal station on Trikuta mountain at a critical period of the season, whereby the work laid out became impracticable of execution. Notwithstanding these delays, the principal series had advanced far beyond the topographical operations, the latter progressing more slowly on account of the great breadth over which it had been extended, embracing the country from 60 or 70 miles into the plains on the south of the series, up to the British boundary in the mountain chain on the north, which comprises a belt of from 100 to 150 miles broad. In consequence of the annexation of the Panjáb, which removed the boundary of the British empire from the Sutlej to the mountain ranges beyond the Indus, the rapid extension of the triangulation was a point of great importance, in order to furnish a basis for the revenue surveys of the newly acquired districts, as well as to connect the desultory surveys which were being executed in Hazára, Pesháwar, &c. To accelerate these objects, Lieut. Colonel Waugh separated the trigonometrical from the topographical operations, and placed another party under Mr. George Logan, whose services were now available from the completion of their work in Bengal, upon the principal triangulation, to which their attention was to be entirely confined, while Captain DuVernet was directed to concentrate his party on

the topographical details which required his undivided care, on account of the great difficulties of the survey arising from the rugged features of the country and its rigorous climate.

The party under Mr. Logan left head quarters, Dehra, early in October, and arrived

Season 1850-51.

PERSONNEL.

George Logan Esquire, 1st Assistant.  
 Mr. W. E. N. James, Junior 1st Class Sub-Assistant.  
 „ J. B. N. Hennessey, do.  
 „ J. O. N. James, do.  
 „ C. J. Carty, 3rd Class Sub-Assistant.

at the closing stations of Captain DuVernet's operations of the previous season on 10th November. As no stations had been selected in advance, the entire party was employed in the first instance on this duty. Serious objections having been made to the occupation of the

sacred mountain of Trikuta, the station was given up to obviate further misunderstandings, but the substitution of a suitable station for it, was not accomplished without some difficulty and delay. Owing to this, the approximate series was carried only as far as the Jhiam by the 1st January, when Mr. Logan returned to commence the final observations. The extreme severity of the winter this season in the north-west, accompanied as it was by unusually heavy falls of rain in the plains and snow in the hills, greatly retarded the progress of the operations and prevented the commencement of observations till 24th January, from which time up to the 15th February, the weather continued very unfavourable. By the exertions of Mr. Logan and his assistants however, a creditable out-turn of work was accomplished by the end of April, at which time, on account of the great length of the sides of the triangles and the setting in of bad weather, the field operations were brought to a close. Observations were completed at 12 principal stations, forming three quadrilaterals and one polygon, comprising 18 principal triangles, which extend over a direct distance of 112 miles. In connection with this, 93 secondary triangles were laid down, fixing several remarkable places and large towns, including those of Siálkot, Jammu and Jhiam, and also the most conspicuous points on the Pir Panjal range.

On Mr. Logan's return to take up the principal observations, the approximate series was intrusted to Mr. W. James, who completed the selection of the stations as far as the Indus, where the series terminates. The triangles selected were very symmetrical and exceedingly large and the sites of the stations judiciously chosen. The manner in which Mr. W. James carried out the duties assigned to him afforded Mr. Logan great satisfaction.

The Rávi triangulation was executed during this season by Mr. J. B. N. Hennessey, with a 14-inch theodolite. It emanates at Pagwánsir, a principal station of the main series, situated on the Rávi, near Pathámkot, and follows the course of the river as far as Lahore; thence it crosses the Bari doab, *viá* Amritsar, and terminates on the Beas, forming a junction with the Beas minor series. This operation occupied Mr. Hennessey from the beginning of November till the end of March, during which interval, he experienced considerable delay from unfavourable weather. On the completion of the Rávi triangulation, Mr. Hennessey carried a minor series, with the same instrument, from the principal stations of Kudiáli and Daolatnagar, to connect the city of Wazirabad on the Chenáb: this was accomplished by the end of April. The total triangulation executed by Mr. Hennessey extends 250 miles in length and consists of 170 triangles and 175 secondary points, embracing and fixing the principal places in the cities of Lahore, Amritsar and Wazirabad and the town of Gújrát.

Mr. Logan took the field again on 1st October 1851 and marched *viâ* Amballa, Amritsar and Jhilam, to the station of Jogi-Tila, up to which point the principal observations had been carried in the previous season. The selection of a base-line of verification being the first object of importance to furnish a terminal side to the series, Mr. James was sent to the valley of Chach for this purpose. By the end of December, a suitable site was selected near Attock, on the east

Season 1851-52

PERSONNEL

George Logan Esquire, 1st Assistant.  
 Mr. W. R. N. James, Junior 1st class Sub-Assistant.  
 " C. J. Carty, 2nd class Sub-Assistant.  
 " W. H. Johnson, do.  
 " C. Shelverton, 3rd class Sub-Assistant.

bank of the Indus, and the triangulation connected therewith. On the completion of this duty Mr. James proceeded southwards to select stations for the Indus Series, the triangulation of this part of the country being urgently required to furnish a basis for the topographical survey of the Jhilam and Ráwal Pindi districts, then being commenced by Lieutenant D. G. Robinson, of the Bengal Engineers.

Mr. Logan commenced the measurement of the principal angles on 12th November at Jogi-Tila station, and by the beginning of January completed two hexagonal figures, up to the Chach base-line, which brought the operations of the North-West Himalaya Series to a satisfactory termination. Observations were taken at 12 principal stations, forming 12 triangles and extending over a distance of 90 miles. On the completion of this undertaking, Mr. Logan commenced the observations of the stations forming the first figure of the Indus Series which had been selected by Messrs. James and Carty, and by the end of March completed a double polygon, comprising 9 triangles, extending over a distance of 70 miles. The total area embraced by the principal triangulation during the season was 6,665 square miles.

The Chach base-line was measured in the field season of 1853-54 and on the completion of the computations thereof, the measured distance showed a discrepancy of about 10 inches, in defect, from the value deduced by the triangulation, brought up from the Dehra Dún base-line over a distance of 408 miles. Thus the ratio of the error generated in the course of the triangulation, to the length of the base, was =  $21\mu$ ,  $\mu$  being the millionth part of the length. This value of the error is taken from the original computations which were made at the time when the triangulation was reduced according to Colonel Everest's method of successive approximations.

In the field season of 1852-53, Mr. Logan commenced the Rahún Meridional Series: part of his establishment however, was employed during this season in executing some further secondary triangulation in connection with the operations of the North-West Himalaya Series. Mr. J. W. Armstrong, after completing the Hurilaong Meridional Series, was transferred to Mr. Logan's party, and in 1852-53 conducted a secondary series along the Chenáb river, from the principal stations of Kalidhar and Derá in the vicinity of Aknúr, where the river debouches from the mountains. Mr. J. P. Dunlop, 3rd Class Sub-Assistant, joined Mr. Armstrong in the beginning of March, when the triangulation had reached Siálkot. The operations were then conjointly carried on as far as Rámnagar; Mr. Dunlop observing the angles on one flank of the river with a 12-inch theodolite, while Mr. Armstrong observed on

the other with a 14-inch theodolite. On reaching Rámnagar, Mr. Dunlop was intrusted with the charge of the Chenáb triangulation and Mr. Armstrong proceeded to take up the triangulation of the river Jhílam, in the vicinity of Mirpúr and Chaomúk.

The Chenáb triangulation was carried to a point about 50 miles below Rámnagar, and extends over a distance of 140 miles: it comprises 212 first and second class triangles, embracing an area of 560 square miles. The terminating stations were securely marked by masonry pillars for future continuation.

The Jhílam river triangulation emanates from the stations of Kandi and Bular and closes on Jogi-Tíla H.S. in the vicinity of Jhílam. This triangulation was executed with a 14-inch theodolite and its length is about 30 miles, consisting of 99 first and second class triangles, covering an area of 120 square miles.

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*Secondary triangulation in connection with the topographical operations of the North-West Himalaya Series.*

Up to the field season of 1849-50, the operations under Captain DuVernet had been limited to the Sub-Himalayan ranges, where the most favourable season for surveying is during the winter, for though this tract is then liable to falls of snow, it is subject during the summer months to the full force of the monsoon, when the hills are enveloped by clouds and mist which impede vision and prevent all progress. In 1851, when the geodetical part of the operations was transferred to Mr. Logan, Captain DuVernet's work was extended into the highlands and valleys of Kanáwar, Lahaol, Spiti &c., bordering on Ladák and Chinese Tartary, to enter which the great chain of the Himalayas had to be crossed. This tract presents impediments of the most formidable and arduous kind to survey operations, owing to the rugged nature of the country, the stupendous character of the acclivities, the depth, narrowness and rocky features of the valleys, and the difficulties of transport and scarcity of provisions. The passes over the culminating range are, with a few exceptions, rarely under 17,000 or 18,000 feet above the sea, and are consequently penetrable only during the summer months; during this period even, survey operations in this region are not attended without risk as it is subject to avalanches, until the snows are bound by frost in September, when the passes become liable to be closed. The survey of this tract therefore had to be effected in a limited time.

In the summer of 1851, Mr. H. Keelan conducted a secondary series, with a 14-inch theodolite, from the principal stations of Kasáli and Bárádevi, up the valley of the Sutlej, through Rámpúr, Chini, Shipki and Dankar, and thence through Spiti, across the Kunzam pass as far as the Bára Lácha pass which leads from the British district of Lahaol into Ladák. The triangulation is 240 miles in length, comprising 300 first and second class triangles. The stations, of which there were fifty-six, were mostly situated on very high elevations: the heights of the stations between Rámpúr and Chini varied from 12,000 to 14,000 feet above the level of the sea; those between Chini and Bára Lácha from 14,000 to nearly 19,000 feet, twelve of the stations being upwards of 17,500 feet high, and the highest station visited being

18,900 feet. The severity of the climate and the rarefied condition of the atmosphere at such great elevations, as well as the difficulty and risk attending their ascent, rendered these operations, an undertaking of the most arduous character, and its successful completion reflects great credit on Mr. Keelan's talents and endurance.

In 1851, Mr. J. Mulheran carried a chain of triangles, with a 14-inch theodolite, from Cherú in Mandi, through Kúllú across the Rotang pass to Kuarang near Tandi, and thence up the Bhága valley to the Bára Lácha pass in Lahaol, where a connection was formed with Mr. Keelan's work. This triangulation extends over a distance of 100 miles and comprises 113 first and second class triangles. After effecting a junction with the Sutlej triangulation, Mr. Mulheran continued his series down the valley of the Chandra Bhága as far as Triloknáth and thence carried it over the Kalichu pass through Chamba and formed a junction with the principal stations of Háthidhár and Dálá. This portion of the triangulation is 100 miles in length and consists of 115 first and second class triangles. The stations in both these series were all more or less elevated, the greatest height visited being 18,400 feet above the sea level.

In 1852, Mr. J. Mulheran carried a minor series, with a 14-inch theodolite, from the principal stations of Háthidhár and Dálá across the Sachi and Gardhar passes in Chamba, to Bámankoti and b needle rock on the Chandra Bhága, stations common to the Kalichu series. This triangulation, which is 102 miles in length, passes through a portion of territory above Kistowár, called the Panji pargana, which had been represented as exceedingly formidable, if not impracticable, for survey operations; but as the civil authorities were urgent for the survey of this tract, not only for the sake of completing the map of British territories, but in order to obtain information regarding the supply of timber from the banks of the Chandra Bhága, Mr. Mulheran was deputed on this enterprise, and most ably he carried it out. At one time however success seemed doubtful, owing to his meeting with a severe accident, arising from a fall over precipitous ground, which caused him much suffering for upwards of a month. Many of the stations were over 17,000 feet high.

On the completion of this undertaking, Mr. Mulheran carried a chain of triangles, 32 miles in length, from Halaus and Manimais, stations of the Kalichu minor series, through the Bara Bhágal pargana at the source of the Rávi, across the Makori pass to the stations of Sui and Debidhár of the Kángra Hill Series. The highest elevation visited was 15,485 feet.

In 1851-52 Mr. J. Dyer carried a minor series from Masúri across the hills to the stations of Phágu and Sháli in the neighbourhood of Simla, and thence brought back the triangulation by a northern range to Deoban H.S. forming a circuit of about 140 miles.

In the summer of 1852, Mr. H. Keelan conducted a series of secondary triangles from Banog H.S. in the vicinity of Masúri, to Rámgarh H.S. of the North-East Longitudinal Series near Sirinagar on the Ganges. It consists of eleven stations extending over a distance of 64 miles; the angles being measured with a 14-inch theodolite.

In the field season of 1852-53, Mr. George Shelverton carried a chain of triangles

from Hardwár on the Ganges, over the Sewalik range, which bounds the Dehra Dún on the south, to the Jumna. This triangulation is 50 miles in length and comprises 70 triangles covering an area of 400 square miles : the angles were measured with a 12-inch theodolite.

In 1853, Mr. J. Dyer conducted a secondary triangulation, with a 12-inch theodolite, from the Gurhwál triangulation which had been executed by Mr. Keelan in 1852, northwards towards the heads of the Bhágirati and Jahnevi rivers above Gangútri. It was intended to extend this triangulation northwards from thence, across the great snowy range, along the range in which the Baspa, Nisang, and other tributary rivers of Kanáwar have their source. In the middle of June, when the series had been carried as far as Gangútri, Mr. Dyer received information that the Nela pass (between 19,000 and 20,000 feet above the sea) over which the triangulation was to be carried, would not be open before the month of September, and that if then practicable, it would be impossible to occupy positions on the range. He therefore closed his operations, which consisted of observations at eleven stations extending over a direct distance of about 50 miles, and retraced his steps. In September 1853, a second attempt was made from the Kanáwar side by a larger party consisting of Messrs. J. Mulheran, G. Shelverton and J. Dyer; but owing to heavy falls of snow early in October, which rendered the route across the great glacier on the northern face of the ridge extremely unsafe, they were obliged again to retire. As the connection of the Gurhwál and Kanáwar triangulations was an important object, it was resolved to persevere in the attempt.

In the spring of 1854, therefore, another detachment was formed under Messrs. J. Mulheran, and W. H. Johnson, who proceeding on a plan of operations sketched out by Lieutenant Colonel Waugh, successfully accomplished the task which, from the stupendous difficulties it was beset with, had baffled two previous attempts. Mr. Johnson commenced operations in Kanáwar from the stations of Sapni and Rakchora of the Sutlej minor series, and carried the triangulation up the Baspa valley to the Nela pass at the head of the Baspa river and thence formed a junction with the Bhágirati triangulation near Gangútri. Observations were taken with a 12-inch theodolite at seventeen stations extending over a distance of about 60 miles. Some of the stations visited by Mr. Johnson in the course of this series, were upwards of 18,000 and 19,000 feet above the sea level, and were peculiarly difficult of access owing to the immense quantities of snow that covered the northern features of the great range bounding Bisahir. The snowy peak known as Nela station, 19,086 feet high, situated immediately above the great glacier on the northern face of the Nela pass, was approached by Mr. Johnson over the Chota Gháti glacier, the fissures of which were impassable a few days after he had visited the station.

During the same period Mr. Mulheran triangulated the Nisang and Charang valleys in Kanáwar, with a 12-inch theodolite.

The above comprises the whole of the secondary triangulation which was executed in order to furnish a basis for the topographical survey of the tract of the Himalayas included between the plains on the south, the frontiers of Ladák and China on the north, the Maharajah of Kashmir's dominions on the west, and the Ganges on the east.

*August 1873.*

H. R. THULLIER.

## ALPHABETICAL LIST OF STATIONS.

Amsot (of base-line figures.)	(XI).	Kasáolí	VII.
Bán	XXVI.	Khagríáná (of base-line figures.)	(XVIII).
Banog (of base-line figures.)	(X).	Kotí	XVIII.
Bárádeví	IX.	Kudiáolí	XXXIV.
Baráol	X.	Lipíáná	XXI.
Chitán	IV.	Mangí	XV.
Chorúsirá	XXXIII.	Medwání	XII.
Dádú	III.	Mongrí	XXXIX.
Dálá	XXIV.	Nádá	VI.
Dáolatnagar	XXXV.	Nainádeví	XI.
Derá	XXVIII.	Nerh	XL.
Dinaládh	XX.	Pagwánsir	XXIII.
Gochá	VIII.	Pír-Badesar	XXXII.
Gúmbar	XIX.	Rahún	XIII.
Gurhágarh	XXVII.	Rámpúr	I.
Hátídhár	XXII.	Solásinghí	XVI.
Híú	XIV.	Sámnábanj	XXV.
Jáolí	XXXVIII.	Shegálá	XXIX.
Jogí-Tílá	XXXVI.	Shí	V.
Júin	II.	Súrlá (of base-line figures.)	(XIX).
Kalidhar	XXX.	Tárakot	XXXI.
Kandi	XXXVII.	Tiprí	XVII.

## NUMERICAL LIST OF STATIONS.

(X)	Banog. (of base-line figures.)	XXI	Lipíaná.
(XI)	Amsot. (of base-line figures.)	XXII	Hátídhár.
I	Rámpúr.	XXIII	Pagwánsir.
II	Júin.	XXIV	Dálá.
III	Dádú.	XXV	Sámnábanj.
IV	Chitán.	XXVI	Bán.
V	Shí.	XXVII	Gurhágárh.
VI	Nádá.	XXVIII	Derá.
VII	Kasáolí.	XXIX	Shegálá.
VIII	Gochá.	XXX	Kalidhar.
IX	Bárádeví.	XXXI	Tárákot.
X	Baráol.	XXXII	Pír-Badesar.
XI	Nainádeví.	XXXIII	Chorúsirá.
XII	Medwání.	XXXIV	Kudiálí.
XIII	Rahún.	XXXV	Dáolatnagar.
XIV	Híú.	XXXVI	Jogí-Tílá.
XV	Mangí.	XXXVII	Kandi.
XVI	Solásinghí.	XXXVIII	Jáolí.
XVII	Tiprí.	XXXIX	Mongrí.
XVIII	Kotí.	XL	Nerh.
XIX	Gúmbar.	(XIX)	Súrlá. (of base-line figures.)
XX	Dinaládh.	(XVIII)	Khagríaná. (of base-line figures.)



## NORTH-WEST HIMALAYA SERIES.

## DESCRIPTION OF STATIONS.



I. Rámpúr Hill Station, lat.  $30^{\circ} 28'$ , long.  $77^{\circ} 24'$ , is situated in pargana Chichiraoli, zilla Ambala, on the lower range of hills to the north of a small village, after which it is called.

The pillar is 2 feet high, and has two mark-stones, one at surface, and the other at bottom.

II. Júin Hill Station, lat.  $30^{\circ} 42'$ , long.  $77^{\circ} 38'$ , is situated in pargana Kongra, zilla Sirmaor, on the highest peak of a ridge from which it derives its name. The road to the station is from Shíam, at the junction of the Palar and Girí rivers, and passes by Shinga and Andari.

The pillar is 2 feet high. It has one mark-stone at top, and another at bottom.

III. Dádú Hill Station, lat.  $30^{\circ} 39'$ , long.  $77^{\circ} 16'$ , is situated in pargana Sirmaor, taluk Náhan, on the highest point of the ridge. The town of Náhan is 4 miles to the south. The high road from Náhan to Bagtiála passes  $\frac{1}{2}$  mile to the east of the station.

The pillar is 2 feet high, and carries one mark-stone at top and another at bottom.

IV. Chitán Station, lat.  $30^{\circ} 28'$ , long.  $77^{\circ} 4'$ , is in a field on the south side of the road leading from Shozádpúr towards Rúpar; pargana Shozádpúr, taluk Naraingarh, zilla Ambala. The small village from which the station takes its name is distant about  $\frac{1}{4}$  of a mile.

The pillar is 2 feet high, and has two mark-stones placed as usual, one at top, and another at bottom.

V. Shí Hill Station, lat.  $30^{\circ} 52'$ , long.  $77^{\circ} 27'$ , is situated in pargana Karlí, taluk Sirmaor, on a low spur running westerly from the Chúr mountain. The station is distant about 12 miles from the junction of the Girí and Jalar rivers; the road from the latter to the former passes through the villages of Katra and Manjon.

The pillar is 2 feet high, and has two mark-stones, one at top, and the other at bottom.

VI. Nádá Hill Station, lat.  $30^{\circ} 41'$ , long.  $76^{\circ} 57'$ , is situated in pargana Pinjor, taluk

Patiálá, zilla Ambala, on a peak of a low range of sandhills. The village of Nádá is about a mile to the west, that of Rámgarh 2 miles to the south, and Deví Nagar the same distance N.W.

The pillar is 2 feet high, with a mark-stone at top, and another at bottom.

VII. Kasáolí Hill Station, lat.  $30^{\circ} 53'$ , long.  $77^{\circ} 1'$ , is situated on the highest peak in the centre of the cantonment.

The pillar is 2 feet in height. It has a mark-stone at top, and another at bottom.

VIII. Gochá Hill Station, lat.  $30^{\circ} 53'$ , long.  $76^{\circ} 46'$ , is situated in pargana Rúpar, taluk Khizarábád, zilla Ambala, on a small peak of the low hills bounding the Pinjor Dún. The village from which it takes its name is about 1 mile to the S.W.

The pillar is 2 feet in height; two mark-stones were imbedded in it, one at top, and the other at bottom.

IX. Bárádeví Hill Station, lat.  $31^{\circ} 12'$ , long.  $76^{\circ} 56'$ , is situated in pargana Sirian of Bagal, zilla Simla, on the highest point of the mountain called Bárídhár. The principal roads to Simla, Sabattoo, Biláspúr, Rámgarh and Nálágarh, pass through Sai-ka-hatti, a small village at the south-west base of the hill.

The pillar is 2 feet high, and has two mark-stones, one at top, and the other at bottom.

X. Baráol Hill Station, lat.  $31^{\circ} 3'$ , long.  $76^{\circ} 30'$ , is situated on a peak of the same name on the range of low sandhills on the right bank of the Sutlej; pargana Takhtgarh, taluk Rúpar, zilla Hoshiarpore. The road to the station passes through the villages of Bujrúr, Rai-púr and Kotá.

The pillar is 2 feet high, and has two mark-stones, one at top, and the other at bottom.

XI. Nainádeví Hill Station, lat.  $31^{\circ} 18'$ , long.  $76^{\circ} 35'$ , is built on a rock at the south-east angle of the celebrated pagoda, after which it is called. The villages of Makool and Ananpúr are about 4 miles distant, and a town containing several hundreds of houses lies to the S. at about  $\frac{1}{2}$  mile. The station is approached from the south-west by stone steps leading up from Kotí.

The pillar is 2 feet in height; mark-stones were placed as usual, one at top, and another at bottom.

XII. Medwání Hill Station, lat.  $31^{\circ} 18'$ , long.  $76^{\circ} 14'$ , is situated on the range of hills 7 miles to the north of Garshankar, and on the road to Hoshiarpore. The village after which it is named is 1 mile to the east.

The pillar is 2 feet in height. It has a mark-stone at top, and another at bottom.

XIII. Rahún Station, lat.  $31^{\circ} 3'$ , long.  $76^{\circ} 10'$ , is situated on one of the highest buildings within the fort, which stands in the centre of the town of Rahún.

The pillar is 20.5 feet in height. It has four mark-stones, one at top, another at bottom, and other two at 8 and 16 feet respectively above the latter.

XIV. Híu Station, lat.  $31^{\circ} 13'$ , long.  $76^{\circ} 2'$ , is situated at the N.E. angle of the village so called. The town of Bangai, in the Jullandar district, is distant about a mile and a-half.

The pillar is  $7\frac{1}{2}$  feet in height; three mark-stones were placed in it, one at top, another at bottom, and the third 4 feet above the latter.

XV. Mangí Hill Station, lat.  $31^{\circ} 35'$ , long.  $76^{\circ} 5'$ , is situated on a peak about a mile west of the principal ridge of sandhills, which are to be found some 12 miles to the east of Hoshiarpore.

The pillar is 2 feet in height, and carries two mark-stones, one at top, and another at bottom.

XVI. Solásinghí Hill Station, lat.  $31^{\circ} 38'$ , long.  $76^{\circ} 25'$ , is situated at the south-east end of a conspicuous stone fort crowning the ridge of hills that form the eastern boundary of the valley of the Son river. Nadáon is distant about 10 miles to the north, and the well-known fort and temple of Cháomukhí are about a mile to the west.

The pillar is 2 feet high, and contains two mark-stones, one at top, and the other at bottom.

XVII. Tiprí Hill Station, lat.  $31^{\circ} 50'$ , long.  $76^{\circ} 7'$ , is situated on the highest point of the ridge of hills which form the eastern boundary of the Son, some 2 miles N. of Chintpurní temple, and about a mile S. of Tiprí village. The cart-road to Kangra passes by the station.

The pillar is 2 feet high. It has a mark-stone on its upper surface, and another at bottom.

XVIII. Kotí Hill Station, lat.  $31^{\circ} 50'$ , long.  $75^{\circ} 53'$ , is situated at the head of a ravine about 10 miles S.E. of Hájpúr, on the low range of hills lying between that place and Hoshiarpore. The village after which it is named is distant  $\frac{1}{4}$  of a mile to the north.

The pillar is 2 feet high, and contains two mark-stones, one at its upper surface, and the other at its foundation.

XIX. Gúmbar Hill Station, lat.  $31^{\circ} 55'$ , long.  $76^{\circ} 20'$ , is situated on the most remarkable peak at the northern end of the Joálá Mukhí range. The village of Gúmbar lies immediately below the station, on the road from Joálá Mukhí to Kangra, and Habraol is distant some 2 miles to the N.N.E.

The station-mark is cut on the bare rock, and consists of a dot and circle, with lines radiating from the former.

XX. Dinaládh Hill Station, lat.  $32^{\circ} 8'$ , long.  $75^{\circ} 53'$ , is situated in pargana Núrpúr, district Kangra, on the western range of the Himalayas. It derives its name from the two villages Dina and Ládh, which are in its vicinity. The town of Mírthal is distant about 7 miles to the S.W. The station is approached by the great ravine running from Daori to Hoari, and thence by a road which crosses the hills.

The pillar is 2 feet high, and contains two mark-stones; one at its upper surface, and the other at its foundation.

XXI. Lipíaná Hill Station, lat.  $32^{\circ} 9'$ , long.  $76^{\circ} 12'$ , is situated on the highest peak of

a range of hills, through which, at about 2 miles S.E. of the station, the river Gaj flows. The celebrated hot-spring of Tattápáni is distant some  $2\frac{1}{2}$  miles towards the S.E., and the station of Kangra about 10 miles in the same direction.

The pillar is 2 feet in height, and carries two mark-stones; one at top, and the other at bottom.

XXII. Hátídhár Hill Station, lat.  $32^{\circ} 21'$ , long.  $76^{\circ} 3'$ , is situated on the highest point of the rocky range of hills which form the boundary between the Kangra district and the hill state of Chambá. The ascent may be made from the bed of the river below the fort of Tárágarh. There are several villages on the mountain, that of Koti being rather a considerable one.

The pillar is 2 feet high, and contains two mark-stones; one at its upper surface, and the other at its foundation.

XXIII. Pagwánsir Station, lat.  $32^{\circ} 15'$ , long.  $75^{\circ} 34'$ , is situated on the east bank of the Ráví, and is slightly elevated above the surrounding cultivation. The town of Sújánpúr is 6 miles to the north, that of Pathánkot 8 miles to the S.E., and Tergarh is distant about a mile also to the S.E.

The pillar is 2 feet high, and contains two mark-stones; one at its upper surface, and another at its foundation.

XXIV. Dálá Hill Station, lat.  $32^{\circ} 26'$ , long.  $75^{\circ} 48'$ , is situated on the highest point of the outer range of hills 1 mile south of the Ráví. The village of Phangota is about 2 miles to the N.W., and that of Tád a mile to the N.

The pillar is 2 feet high. It contains two mark-stones, one at top, and another at bottom.

XXV. Sámnábanj Hill Station, lat.  $32^{\circ} 44'$ , long.  $75^{\circ} 28'$ , is situated in the Jammú territories, on the centre of a conspicuous stone tower at the east end of the great mountain range lying between Samartha and Rámnagar. The road between these places passes close by the tower.

The pillar is 20 feet high, and contains three mark-stones, one at top, another at bottom, and a third 10 feet above the latter.

XXVI. Bán Hill Station, lat.  $32^{\circ} 34'$ , long.  $75^{\circ} 14'$ , is situated in the Jammú territories, about 1 mile N.E. of the village of that name, and some 4 miles E. of the town of Samba.

The pillar is 2 feet high, and contains two mark-stones, one at top, and another at bottom.

XXVII. Gurhágarh Hill Station, lat.  $32^{\circ} 38'$ , long.  $75^{\circ} 5'$ , is situated on the outer range of the Himalayas, about 5 miles N.W. of Sámhá, 18 miles E. of Jammú, 2 miles W. of the famous temple of Attarbení, and some 2 miles N. of the village after which it is named.

The pillar is 2 feet high. It carries a mark-stone at top, and another at bottom.

XXVIII. Derá Station, lat.  $32^{\circ} 46'$ , long.  $74^{\circ} 41'$ , is situated on the site of an old village in pargana Goozerat, thana Bajwás, maoza Barísir, and district Goozerat. The village from which it takes its name is N.E. at about  $\frac{1}{4}$  of a mile.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXIX. Shegálá Hill Station, lat.  $32^{\circ} 50'$ , long.  $75^{\circ} 8'$ , is situated in the Balwalta pargana of the Jammú territories, on the crest of the hill between the well-known villages of Jindraw to the south, and Barera to the north.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXX. Kalidhar Hill Station, lat.  $33^{\circ} 0'$ , long.  $74^{\circ} 29'$ , is situated on the range of hills after which it is named, in thana Kalít, tahsil Manoar, district Jammú, and immediately west of the gorge through which the Thoí river passes to the plains. The road leading up to the station commences at the village of Nanuá.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXXI. Tárakot Hill Station, lat.  $33^{\circ} 0'$ , long.  $74^{\circ} 58'$ , is situated on the summit of a small hill, S.W. of the high and well-known sacred hill of Tríkuttá, in pargana Katrá Hansalí, tahsil Riási and district Jammú. The well-known bazar of Katrá is distant about 0·8 miles to the east.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXXII. Pír-Badesar Hill Station, lat.  $33^{\circ} 18'$ , long.  $74^{\circ} 12'$ , is situated on the well-known hill of that name in mouza Sarí, pargana Banná, thana and tahsil Náosherá, district Jammú. The highest part of the hill is occupied by temples, the station being about 0·3 miles S. of them, and 50 or 60 feet lower.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXXIII. Chorúsirá Hill Station, lat.  $33^{\circ} 17'$ , long.  $74^{\circ} 42'$ , is situated on a prominent point of an extensive range of hills immediately south of the Pír Pinjál, mouza Kari, pargana Khorbení, tahsil Náosherá, district Jammú. The large and well-known village of Khorbení is about 4 miles distant. The road from Sialkot to Kashmír passes below and south of the station.

The pillar is solid, and 2 feet high, having one mark-stone at top, and another at bottom.

XXXIV. Kudiáli Hill Station, lat.  $33^{\circ} 5'$ , long.  $74^{\circ} 6'$ , is situated on the same range as Kalidhar H.S. in mouza Kudiáli, pargana Saman, thana Amargarh, and tahsil Náosherá. The small village from which it takes its name is about 0·1 mile to the N.E., and the town of Bhimbar lies at the foot of the hill to the S.E., and distant some 10 miles. A road leading from the plains to Kashmír passes E. of the station and within a hundred yards.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXXV. Dáolatnagar Station, lat.  $32^{\circ} 45'$ , long.  $74^{\circ} 7'$ , is situated on the N.E. corner of the elevated site of an old serai, and to the north of the large village after which it is named, in pargana and thana Dáolatnagar, tahsil and district Goozerát. The city of Goozerát is distant about 13 miles to the S.W.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXXVI. Jogí-Tílá Hill Station, lat.  $32^{\circ} 52'$ , long.  $73^{\circ} 29'$ , is situated on the well-known

hill of that name in thana and tahsil Rhotás, district Jhelum. The station is about a hundred yards S.E. of the large temple and nearly the same distance E. of the smaller one.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXXVII. Kandi Hill Station, lat.  $33^{\circ} 19'$ , long.  $73^{\circ} 56'$ , is situated on the well-known hill of that name in the mouza of Amban, pargana of Phulel, tahsil Náosherá, district Jammú. The villiage of Amban, from which the station is approached, lies about 2 miles to the S.W.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXXVIII. Jáolí Hill Station, lat.  $33^{\circ} 17'$ , long.  $73^{\circ} 13'$ , is situated on a small hill about  $1\frac{1}{2}$  mile N. of the large and well-known town of Súkho, in the pargana, thana, and tahsil of Súkho, district Rawal Pindi. The small villiage after which the station is named is about  $\frac{1}{4}$  of a mile to the south.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XXXIX. Mongrí Hill Station, lat.  $32^{\circ} 48'$ , long.  $72^{\circ} 50'$ , is built on a low hill immediately north of the Salt Range, in the thana and tahsil of Chakwal, and district of Jhelum. The villiage of Shamsabád is about 2 miles to the N.E., and that of Khaí about the same distance to the N.W.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

XL. Nerh Hill Station, lat.  $33^{\circ} 44'$ , long.  $73^{\circ} 35'$ , is situated on the well-known hill of that name in the thana of Kahútá, tahsil of Kallar, and district of Rawal Pindi.

The pillar is solid, and 2 feet high. It contains a mark-stone at top, and another at bottom.

(XVIII). Khagríaná Hill Station (*for description, see base-line figures*).

(XIX). Súrlá Hill Station (*for description, see base-line figures*).



ADDENDUM TO DESCRIPTION OF STATIONS.

9\*—c.

NOTE.—Consequent on modern alterations of district and other boundaries, the sites occupied by the stations are now included in civil divisions of territory which differ frequently from the district, pargana or village, recorded in the preceding descriptions of stations: a suitably modified statement of the subdivisions in question is accordingly given in the following table and is derived chiefly from the annual reports, up to 1873, made by the Civil Officials to whose care the stations have been committed.

It has become customary in modern times to erect a square protecting pillar at Principal Stations over the circular pillar on which the large theodolite stood and which carries the true mark-stone; the square pillar bears a sufficiently accurate mark for Topographical and Revenue Survey purposes, so that it is generally unnecessary to refer to the true mark-stone which thus remains concealed and protected. The only station which is protected in the manner described is (X).

No.	Local name	District	Pargana &c.	Village	Remarks
(X)	Tibba Banauri	Dehra Dún	Dehra, Western Dún	Masúri	
(XI)	Timli Forest	"	"	Timli Forest	Platform considerably damaged on the west and south sides.
I	Biláspur	Ambála	Jagádhri	Rámpur Garhi	
II	Kángra	Simla	Kángra	Juin	
III	Sirmur	"	Sirmur	Dádu	
IV	Náráyangarh	Ambála	Náráyangarh	Chittan	
V	Kárli	Simla	Kárli	Shi	
VI	Chandigarh	Ambála	Pattiála Iláka	Náda	
VII	Kasauli (Kussowli)	Simla	Kasauli	Kasauli Cant.	
VIII	Khárrár	Ambála	Khárrár	Barána	
IX	Bagal	Simla	Sirián	Sirián	
X	Bajrur	Hushiárpur	Unah-núrpur	Bajrur	
XI	Chandigarh	Ambála	Chandigarh	Nainadevi	
XII	Mahdwáni	Hushiárpur	Garhsankar	Mahdwáni	
XIII	Rahún	Jallandar	Teh. Nawa Shahr	Rahún	
XIV	Hion	"	"	Bunga	
XV	Manji	Hushiárpur	Hushiárpur	Manji	
XVI	Dár Solásinghi	Kángra	Teh. Hamírpur Thá. Barsar Tál. Kotlehr	Solásinghi	
XVII	...	"	Thá. Dehra	Pind Barri	
XVIII	Kothi	Hushiárpur	Dassuah, Háji-pur	Kothi	
XIX	Dársuráni	Kángra	Teh. Dehra Thá. Jwáláji Tál. Changarhaliár	Khadwar	
XX	...	Gurdáspur	Núrpur	Dina or Ládih	
XXI	Lepiána Kedár	Kángra	Tál. Rámgarh Thá. and Teh. Kángra	Lepiána	
XXII	Hátidhár	"	Tál. Núrpur Thá. and Teh. Kángra	Malikh	
XXIII	Bhagwán Sir pillar	Gurdáspur	Teh. and Thá. Pathánkot	Bhagwán Sir and Bhoía	
XXIV	Dála pillar	"	Teh. Pathánkot Thá. Sháhpur	Thára and Dála	

NOTE.—Teh. stands for Tehsíl, Thá. for Thánah and Tál. for Táluka.

No.	Local name	District	Pargana &c.	Village	Remarks
XXV	...	Jammu (Kashmir)	...	...	
XXVI	...	" "	...	Bán	
XXVII	...	" "	...	Gurhagarh	
XXVIII	Dera	Siáلكot	Teh. Siáلكot, Thá. Phokalian, Par. Bajwant	Dehra	
XXIX	...	Jammu (Kashmir)	Balwalta	...	
XXX	...	" "	...	...	
XXXI	...	" "	Katra Hansali	...	
XXXII	...	" "	Banna	Sari	
XXXIII	...	" "	Khorbani	Kari	
XXXIV	...	" "	Saman	Kudiáli	
XXXV	Daulatnagar	Gujrát	Teh. Gujrát Thá. Lalamusa	Daulatnagar	
XXXVI	...	Jhílam	Police Station Jelálpur	Jogí-Týla	
XXXVII	...	Jammu (Kashmir)	Phulal	Amban	
XXXVIII	Jwáláki Dheri	Ráwal Pindi	Gújar Khán	Jwála	
XXXIX	...	Jhílam	...	...	"No pillar exists here now, April 6th 1871."
XL (XIX) (XVIII)	Burj Pír Pohan Burj Pír Kundia Kála Pind	Ráwal Pindi " "	Kahúta " Gújar Khán	Dhoke Pír Pohan Dhoke Mári Bijniál	



NORTH-WEST HIMALAYA SERIES.

OBSERVED ANGLES.



At (X)													
<i>May 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>													
Angle between	Circle readings, telescope being set on (XI)												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	6° 2'	186° 2'	12° 2'	192° 2'	18° 2'	198° 2'	24° 4'	204° 4'	30° 5'	210° 5'	
I & I (XI)	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 2'' 98 <i>w</i> = 3 77 $\frac{1}{w}$ = 0 27 <i>C</i> = 17° 18' 2'' 98
	h60°64	h59°92	h63°26	h60°46	h62°00	h66°88	h61°68	h61°04	h64°56	h63°96	h61°98	h64°82	
	h61°18	h60°76	h62°84	h62°74	h65°42	h64°66	h64°04	h63°44	h64°68	h63°48	h63°96	h63°52	
				h63°14			h62°50			h62°60		h67°18	
					h60°84								
	60°91	60°34	63°05	61°60	63°52	65°77	62°27	62°24	64°62	63°35	62°97	65°17	
I & II	h18°64	h21°32	h22°42	h24°26	h22°36	h19°48	h25°94	h20°56	h20°86	h19°58	h21°80	h19°44	<i>M</i> = 21'' 27 <i>w</i> = 5 76 $\frac{1}{w}$ = 0 17 <i>C</i> = 32° 43' 21'' 34
	h20°10	h21°92	h20°34	h20°40	h21°08	h19°50	h20°66	h19°68	h20°10	h23°60	h22°04	h22°70	
			h22°22			h21°50			h23°96		h23°56		
			h20°54			h23°92							
	19°37	21°62	21°38	21°86	21°72	19°49	23°01	20°12	20°48	22°38	21°92	21°90	

NOTE.—(X) and (XI) appertain to base-line figures.

<p style="text-align: center;">At (XI)</p> <p style="text-align: center;"><i>January 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i></p>		
Angle between	Circle readings, telescope being set on I	<p><i>M</i> = Mean of Groups  <i>w</i> = Relative Weight  <i>C</i> = Concluded Angle</p>
	<p>299° 51' 119° 51' 805° 51' 125° 51' 811° 52' 131° 52' 317° 53' 187° 52' 323° 53' 143° 53' 329° 55' 149° 54'</p>	
I & II	<p style="text-align: center;">" " " " " " " " " " " "</p> <p>h 21° 54' h 23° 68' h 23° 44' h 20° 84' h 21° 74' h 21° 50' h 22° 28' h 24° 92' h 18° 92' h 25° 30' h 19° 44' h 21° 98'                      h 24° 86' h 24° 84' h 21° 46' h 21° 46' h 26° 78' h 20° 06' h 22° 46' h 23° 76' h 21° 96' h 21° 12' h 20° 44' h 24° 88'                      h 22° 12' h 21° 02' h 20° 82' h 26° 24' h 22° 24' h 24° 74'</p>	<p><i>M</i> = 22" 56  <i>w</i> = 4 02  <math>\frac{1}{w}</math> = 0 25  <i>C</i> = 60° 10' 22" 56</p>
II & (X)	<p>h 5° 20' h 4° 48' h 6° 08' h 6° 28' h 5° 78' h 8° 58' h 7° 40' h 4° 62' h 6° 94' h 1° 18' h 9° 68' h 7° 24'                      h 5° 94' h 2° 68' h 5° 64' h 4° 62' h 2° 08' h 6° 94' h 6° 70' h 5° 30' h 6° 92' h 6° 02' h 6° 38' h 2° 12'                      h 6° 84' l 4° 76' h 7° 36' h 6° 38' h 7° 36' h 1° 76'                      l 6° 66'</p>	<p><i>M</i> = 5" 72  <i>w</i> = 4 05  <math>\frac{1}{w}</math> = 0 25  <i>C</i> = 85° 5' 5" 71</p>
<p style="text-align: center;">At I</p> <p style="text-align: center;"><i>January 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i></p>		
Angle between	Circle readings, telescope being set on IV	<p><i>M</i> = Mean of Groups  <i>w</i> = Relative Weight  <i>C</i> = Concluded Angle</p>
	<p>801° 38' 121° 37' 307° 38' 127° 38' 313° 39' 133° 39' 319° 40' 139° 40' 325° 40' 145° 40' 331° 41' 151° 41'</p>	
IV & III	<p style="text-align: center;">" " " " " " " " " " " "</p> <p>h 24° 08' h 30° 10' h 28° 26' h 27° 74' h 25° 40' h 25° 22' h 30° 94' h 25° 60' h 28° 20' h 27° 12' h 29° 26' h 23° 66'                      h 27° 90' h 27° 18' h 25° 96' h 27° 92' h 29° 96' h 26° 98' h 29° 56' h 28° 40' h 30° 50' h 24° 88' h 25° 96' h 27° 86'                      h 26° 78' h 26° 94' h 28° 80' h 25° 52' h 30° 84' h 30° 54' h 24° 94' h 26° 32'                      h 23° 72' h 29° 38' h 27° 84' h 26° 16'                      h 27° 50'</p>	<p><i>M</i> = 27" 43  <i>w</i> = 3 89  <math>\frac{1}{w}</math> = 0 26  <i>C</i> = 58° 23' 27" 42</p>
III & II	<p>h 53° 18' h 55° 10' h 56° 78' h 55° 84' h 58° 58' h 57° 62' h 54° 84' h 56° 22' h 55° 82' h 56° 76' h 58° 48' h 52° 50'                      h 56° 30' h 54° 16' h 57° 22' l 55° 70' h 55° 54' h 55° 76' h 55° 44' h 57° 68' h 60° 70' h 55° 34' h 58° 80' h 58° 12'                      h 55° 46' l 52° 18' h 55° 98' h 56° 68' h 54° 76'                      h 55° 88' h 53° 56' h 59° 90'</p>	<p><i>M</i> = 56" 18  <i>w</i> = 4 54  <math>\frac{1}{w}</math> = 0 22  <i>C</i> = 70° 23' 56" 17</p>
	<p>55° 21' 54° 63' 57° 00' 54° 57' 55° 92' 56° 69' 55° 14' 56° 95' 58° 28' 56° 05' 58° 64' 55° 13'</p>	

NOTE.—(X) and (XI) appertain to base-line figures.

OBSERVED ANGLES.

At I—(Continued.)																																																										
<i>January 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>																																																										
Angle between	Circle readings, telescope being set on IV											M = Mean of Groups w = Relative Weight C = Concluded Angle																																														
	801° 38' 121° 37' 307° 38' 127° 38' 313° 39' 133° 39' 319° 40' 139° 40' 325° 40' 145° 40' 331° 41' 151° 41'																																																									
II & (X)	" " " " " " " " " " " "											M = 5''·72 w = 5·40 $\frac{1}{w} = 0·19$ C = 46° 55' 5''·73																																														
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">h 4'58</td><td style="padding: 2px;">h 6'40</td><td style="padding: 2px;">h 4'22</td><td style="padding: 2px;">h 4'20</td><td style="padding: 2px;">h 2'62</td><td style="padding: 2px;">h 6'14</td><td style="padding: 2px;">h 4'54</td><td style="padding: 2px;">h 8'88</td><td style="padding: 2px;">h 7'88</td><td style="padding: 2px;">h 5'04</td><td style="padding: 2px;">h 3'92</td><td style="padding: 2px;">h 7'06</td> </tr> <tr> <td style="padding: 2px;">h 6'00</td><td style="padding: 2px;">h 7'64</td><td style="padding: 2px;">h 5'90</td><td style="padding: 2px;">h 5'08</td><td style="padding: 2px;">h 3'82</td><td style="padding: 2px;">h 6'72</td><td style="padding: 2px;">h 7'12</td><td style="padding: 2px;">h 6'96</td><td style="padding: 2px;">h 5'22</td><td style="padding: 2px;">h 7'56</td><td style="padding: 2px;">h 4'14</td><td style="padding: 2px;">h 5'86</td> </tr> <tr> <td style="padding: 2px;">h 7'50</td><td></td><td></td><td></td><td></td><td></td><td></td><td style="padding: 2px;">h 3'46</td><td></td><td></td><td></td><td style="padding: 2px;">h 7'10</td> </tr> <tr> <td style="padding: 2px;">6'03</td><td style="padding: 2px;">7'02</td><td style="padding: 2px;">5'06</td><td style="padding: 2px;">4'64</td><td style="padding: 2px;">3'22</td><td style="padding: 2px;">6'43</td><td style="padding: 2px;">5'83</td><td style="padding: 2px;">7'92</td><td style="padding: 2px;">5'52</td><td style="padding: 2px;">6'30</td><td style="padding: 2px;">4'03</td><td style="padding: 2px;">6'67</td> </tr> </table>												h 4'58	h 6'40	h 4'22	h 4'20	h 2'62	h 6'14	h 4'54	h 8'88	h 7'88	h 5'04	h 3'92	h 7'06	h 6'00	h 7'64	h 5'90	h 5'08	h 3'82	h 6'72	h 7'12	h 6'96	h 5'22	h 7'56	h 4'14	h 5'86	h 7'50							h 3'46				h 7'10	6'03	7'02	5'06	4'64	3'22	6'43	5'83	7'92	5'52	6'30
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6'03	7'02	5'06	4'64	3'22	6'43	5'83	7'92	5'52	6'30	4'03	6'67																																															
(X) & (XI)	h 33'54 h 32'70 h 31'64 h 32'28 l 30'18 h 30'92 h 32'24 h 27'84 h 30'66 h 31'68 h 32'86 h 29'72											M = 30''·99 w = 6·09 $\frac{1}{w} = 0·16$ C = 17° 26' 30''·98																																														
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h 32'24	h 30'22	h 30'02	h 33'72	h 33'54	h 30'02	h 31'10	h 30'10	h 27'70	h 29'68	h 30'66	h 28'50																																															
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At II																																																										
<i>April 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>																																																										
Angle between	Circle readings, telescope being set on (X)											M = Mean of Groups w = Relative Weight C = Concluded Angle																																														
	42° 9' 222° 10' 48° 11' 228° 11' 54° 11' 234° 11' 60° 12' 240° 12' 66° 12' 246° 12' 72° 13' 252° 13'																																																									
(X) & (XI)	" " " " " " " " " " " "											M = 33''·18 w = 3·25 $\frac{1}{w} = 0·31$ C = 44° 53' 33''·18																																														
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">d 33'12</td><td style="padding: 2px;">d 32'18</td><td style="padding: 2px;">h 32'72</td><td style="padding: 2px;">d 37'63</td><td style="padding: 2px;">h 29'62</td><td style="padding: 2px;">h 34'36</td><td style="padding: 2px;">h 34'30</td><td style="padding: 2px;">h 34'06</td><td style="padding: 2px;">h 33'58</td><td style="padding: 2px;">h 33'42</td><td style="padding: 2px;">h 36'16</td><td style="padding: 2px;">h 29'48</td> </tr> <tr> <td style="padding: 2px;">d 34'99</td><td style="padding: 2px;">d 33'46</td><td style="padding: 2px;">h 30'52</td><td style="padding: 2px;">d 32'73</td><td style="padding: 2px;">h 31'42</td><td style="padding: 2px;">h 32'28</td><td style="padding: 2px;">h 32'50</td><td style="padding: 2px;">h 33'52</td><td style="padding: 2px;">h 31'78</td><td style="padding: 2px;">h 34'78</td><td style="padding: 2px;">h 36'80</td><td style="padding: 2px;">h 31'30</td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td style="padding: 2px;">h 31'90</td><td></td><td></td><td></td><td></td> </tr> <tr> <td style="padding: 2px;">34'06</td><td style="padding: 2px;">32'82</td><td style="padding: 2px;">31'62</td><td style="padding: 2px;">35'18</td><td style="padding: 2px;">30'52</td><td style="padding: 2px;">33'32</td><td style="padding: 2px;">33'40</td><td style="padding: 2px;">33'79</td><td style="padding: 2px;">32'42</td><td style="padding: 2px;">34'10</td><td style="padding: 2px;">36'48</td><td style="padding: 2px;">30'39</td> </tr> </table>												d 33'12	d 32'18	h 32'72	d 37'63	h 29'62	h 34'36	h 34'30	h 34'06	h 33'58	h 33'42	h 36'16	h 29'48	d 34'99	d 33'46	h 30'52	d 32'73	h 31'42	h 32'28	h 32'50	h 33'52	h 31'78	h 34'78	h 36'80	h 31'30								h 31'90					34'06	32'82	31'62	35'18	30'52	33'32	33'40	33'79	32'42	34'10
d 33'12	d 32'18	h 32'72	d 37'63	h 29'62	h 34'36	h 34'30	h 34'06	h 33'58	h 33'42	h 36'16	h 29'48																																															
d 34'99	d 33'46	h 30'52	d 32'73	h 31'42	h 32'28	h 32'50	h 33'52	h 31'78	h 34'78	h 36'80	h 31'30																																															
							h 31'90																																																			
34'06	32'82	31'62	35'18	30'52	33'32	33'40	33'79	32'42	34'10	36'48	30'39																																															
(XI) & I	h 61'50 h 68'52 h 61'70 h 66'82 h 64'48 h 64'42 h 62'78 h 64'38 h 60'62 h 69'36 h 63'44 h 65'30											M = 5''·39 w = 2·68 $\frac{1}{w} = 0·33$ C = 55° 28' 5''·42																																														
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">h 63'46</td><td style="padding: 2px;">h 65'24</td><td style="padding: 2px;">h 65'46</td><td style="padding: 2px;">h 65'84</td><td style="padding: 2px;">h 65'52</td><td style="padding: 2px;">h 65'00</td><td style="padding: 2px;">h 65'28</td><td style="padding: 2px;">h 64'94</td><td style="padding: 2px;">h 68'52</td><td style="padding: 2px;">h 65'10</td><td style="padding: 2px;">h 64'16</td><td style="padding: 2px;">h 69'88</td> </tr> <tr> <td style="padding: 2px;">d 62'82</td><td></td><td style="padding: 2px;">d 66'78</td><td></td><td></td><td></td><td></td><td></td><td style="padding: 2px;">h 64'48</td><td style="padding: 2px;">d 69'33</td><td></td><td></td> </tr> <tr> <td></td><td></td><td style="padding: 2px;">d 69'74</td><td></td><td></td><td></td><td></td><td></td><td></td><td style="padding: 2px;">d 70'73</td><td></td><td></td> </tr> <tr> <td style="padding: 2px;">62'59</td><td style="padding: 2px;">66'88</td><td style="padding: 2px;">65'92</td><td style="padding: 2px;">66'33</td><td style="padding: 2px;">65'00</td><td style="padding: 2px;">64'71</td><td style="padding: 2px;">64'03</td><td style="padding: 2px;">64'66</td><td style="padding: 2px;">64'54</td><td style="padding: 2px;">68'63</td><td style="padding: 2px;">63'80</td><td style="padding: 2px;">67'59</td> </tr> </table>												h 63'46	h 65'24	h 65'46	h 65'84	h 65'52	h 65'00	h 65'28	h 64'94	h 68'52	h 65'10	h 64'16	h 69'88	d 62'82		d 66'78						h 64'48	d 69'33					d 69'74							d 70'73			62'59	66'88	65'92	66'33	65'00	64'71	64'03	64'66	64'54	68'63
h 63'46	h 65'24	h 65'46	h 65'84	h 65'52	h 65'00	h 65'28	h 64'94	h 68'52	h 65'10	h 64'16	h 69'88																																															
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62'59	66'88	65'92	66'33	65'00	64'71	64'03	64'66	64'54	68'63	63'80	67'59																																															

NOTE.—(X) and (XI) appertain to base-line figures.

At II—(Continued.)													
April 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.													
Angle between	Circle readings, telescope being set on (X)											M = Mean of Groups w = Relative Weight C = Concluded Angle	
	42° 9'	222° 10'	48° 11'	228° 11'	54° 11'	234° 11'	60° 12'	240° 12'	66° 12'	246° 12'	72° 13'		252° 13'
I & III	"	"	"	"	"	"	"	"	"	"	"	"	M = 28" 35 w = 2.76 $\frac{1}{w} = 0.36$ C = 40° 26' 28".44
	h32°10	h26°76	h27°14	h28°18	h28°88	h28°60	h25°16	h28°26	h31°14	h25°96	h26°58	h32°74	
III & V	h22°96	h19°78	h21°42	h18°48	h21°04	h16°80	h23°48	h19°48	h22°88	h19°94	h23°60	h22°22	M = 21" 45 w = 1.72 $\frac{1}{w} = 0.58$ C = 53° 53' 21".46
	h22°64	h28°84	h26°56	h25°22	h27°98	h28°98	h25°06	h30°86	h26°66	h27°08	h27°72	h25°38	
At III													
March 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.													
Angle between	Circle readings, telescope being set on I											M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 1'	180° 1'	6° 2'	186° 2'	12° 3'	192° 3'	18° 3'	196° 3'	24° 4'	204° 4'	30° 4'		210° 5'
I & IV	"	"	"	"	"	"	"	"	"	"	"	"	M = 48" 89 w = 3.14 $\frac{1}{w} = 0.27$ C = 74° 27' 48".93
	h51°58	h47°34	h49°68	h47°80	h54°80	h47°18	h46°84	h53°34	h52°28	h49°10	h45°40	h50°06	
NOTE.—(X) appertains to base-line figures.													

At III—(Continued.)

March 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch  
Theodolite No. 1.

Angle between	Circle readings, telescope being set on I												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0°1'	180°1'	6°2'	186°2'	12°3'	192°3'	18°3'	198°3'	24°4'	204°4'	30°4'	210°5'	
IV & VI	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 8".97 <i>w</i> = 3.78 $\frac{1}{w}$ = 0.26 <i>C</i> = 52° 4' 8".96
	h 4'64	h 6'82	h 9'16	h 12'60	h 11'78	h 8'56	h 7'32	h 10'80	h 9'06	h 7'90	h 8'70	h 9'72	
	h 7'30	h 10'16	h 12'24	h 10'04	h 10'88	h 9'72	h 6'26	h 9'34	h 6'98	h 7'10	h 10'22	h 7'52	
		h 8'30	h 9'26		h 9'18		h 7'92		h 12'84		h 6'20		
									h 10'44				
	5'97	8'43	10'22	11'32	10'61	9'14	7'17	10'07	9'10	7'50	9'46	8'62	
VI & VII	h 25'64	h 18'98	h 21'70	h 20'12	h 21'16	h 24'38	h 25'64	h 20'06	h 21'86	h 25'10	h 20'20	h 20'40	<i>M</i> = 22".30 <i>w</i> = 2.70 $\frac{1}{w}$ = 0.37 <i>C</i> = 39° 31' 22".32
	h 23'26	h 19'50	h 22'92	h 19'32	h 23'38	h 21'40	h 23'16	h 20'80	h 24'78	h 26'68	h 21'88	h 20'96	
					h 23'00		h 23'62	h 23'98	h 25'94				
							h 22'24		h 23'82		h 21'78		
	24'45	19'24	22'31	19'72	22'51	22'89	23'67	21'61	23'64	25'89	21'04	20'68	
VII & V	h 6'82	h 4'50	h 5'88	h 4'90	h 4'72	h 8'16	h 6'86	h 5'16	h 2'62	h 6'18	h 4'94	h 3'98	<i>M</i> = 5".57 <i>w</i> = 5.01 $\frac{1}{w}$ = 0.20 <i>C</i> = 77° 16' 5".57
	h 9'92	h 7'22	h 5'34	h 4'36	h 6'52	h 6'56	h 6'80	h 3'54	h 5'22	h 4'62	h 2'22	h 6'66	
	h 7'22										h 2'86	h 6'98	
	7'99	5'86	5'61	4'63	5'62	7'36	6'83	4'35	3'92	5'40	3'34	5'87	
V & II	h 59'06	h 59'28	h 57'46	h 57'02	h 55'50	h 52'18	h 52'88	h 53'66	h 57'56	h 56'84	h 56'26	h 57'06	<i>M</i> = 56".05 <i>w</i> = 3.54 $\frac{1}{w}$ = 0.28 <i>C</i> = 47° 30' 56".07
	h 57'28	h 54'54	h 54'62	h 57'86	h 57'74	h 53'86	h 52'98	h 55'72	h 56'46	h 57'16	h 57'12	h 54'46	
	d 58'51	d 57'87									h 55'26		
	58'28	57'23	56'04	57'44	56'62	53'02	52'93	54'69	57'01	57'00	56'69	55'59	
II & I	h 33'60	h 39'66	h 39'26	h 37'80	h 36'98	h 38'88	h 39'14	h 41'06	h 36'16	h 36'36	h 38'28	h 39'80	<i>M</i> = 37".93 <i>w</i> = 3.69 $\frac{1}{w}$ = 0.27 <i>C</i> = 69° 9' 37".93
	h 36'02	h 36'38	h 36'46	h 39'32	h 34'78	d 37'20	h 37'18	h 40'22	h 37'04	h 38'76	h 37'58	h 39'50	
	d 35'15	h 43'04											
		h 39'10											
		h 37'54											
		d 40'10											
	34'92	39'30	37'86	38'56	35'88	38'04	38'16	40'64	36'60	37'56	37'93	39'65	

At IV													
<i>January 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>													
Angle between	Circle readings, telescope being set on VI											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	0° 1'	180° 1'	6° 1'	186° 1'	12° 3'	192° 3'	18° 4'	198° 3'	24° 4'	204° 5'	30° 5'		210° 5'
VI & III	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 40''·01  <i>w</i> = 4·37 $\frac{1}{w}$ = 0·23 <i>C</i> = 70° 57' 40''·02
	l 42'88	l 39'42	l 37'52	l 39'16	h 39'80	h 39'12	h 41'82	h 41'98	h 40'44	h 39'80	h 40'96	l 38'32	
III & I	l 38'90	l 43'40	l 36'86	l 35'90	h 39'80	h 39'00	h 41'70	h 40'64	h 38'82	h 40'10	l 40'80	l 39'98	<i>M</i> = 45''·19  <i>w</i> = 6·07 $\frac{1}{w}$ = 0·16 <i>C</i> = 47° 8' 45''·19
	l 43'34	l 42'66		l 41'26							l 41'16	l 38'00	
	41'71	41'83	37'19	38'77	39'80	39'06	41'76	41'31	39'63	39'95	40'36	38'77	
	l 43'94	l 45'72	l 46'42	l 47'14	h 46'08	h 43'42	h 45'16	h 45'16	h 44'70	h 45'54	l 50'10	l 48'12	
	l 47'14	l 44'32	l 44'12	l 43'42	h 43'40	h 43'86	h 44'76	h 45'16	h 46'82	h 47'66	l 43'34	l 44'36	
	l 45'48	l 42'62		l 41'38							l 44'48	l 46'96	
	45'52	44'22	45'27	43'98	44'74	43'64	44'96	45'16	45'76	46'60	45'97	46'48	
At V													
<i>April 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>													
Angle between	Circle readings, telescope being set on II											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	318° 40'	138° 40'	324° 41'	144° 41'	330° 42'	150° 41'	336° 42'	156° 42'	342° 43'	162° 43'	348° 44'		168° 44'
II & III	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 46''·20  <i>w</i> = 6·08 $\frac{1}{w}$ = 0·16 <i>C</i> = 78° 35' 46''·20
	h 47'64	h 46'56	h 47'54	h 48'44	h 45'66	h 45'98	h 44'60	h 47'64	h 46'74	h 47'10	h 45'28	h 43'68	
	h 43'78	h 47'46	h 45'20	h 46'84	h 46'50	h 46'16	h 44'52	h 46'86	h 44'60	h 48'46	h 42'66	h 44'96	
	h 45'96	d 45'20							h 48'14			h 44'78	
		d 49'14										h 47'70	
	45'79	47'09	46'37	47'64	46'08	46'07	44'56	47'25	46'49	47'78	43'97	45'28	

<i>At V—(Continued.)</i>												
<i>April 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>												
Angle between	Circle readings, telescope being set on II											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	318° 40' 188° 40' 321° 41' 144° 41' 330° 42' 150° 41' 336° 42' 156° 42' 342° 43' 162° 43' 348° 44' 168° 44'											
III & VII	" " " " " " " " " " " " <i>d</i> 42° 77' <i>d</i> 42° 33' <i>d</i> 40° 71' <i>d</i> 39° 32' <i>h</i> 40° 46' <i>h</i> 38° 20' <i>h</i> 45° 58' <i>h</i> 42° 20' <i>h</i> 40° 38' <i>h</i> 41° 02' <i>h</i> 41° 60' <i>h</i> 35° 68' <i>d</i> 41° 45' <i>d</i> 38° 99' <i>d</i> 41° 47' <i>d</i> 44° 68' <i>h</i> 40° 44' <i>h</i> 39° 62' <i>h</i> 42° 92' <i>h</i> 41° 48' <i>h</i> 41° 98' <i>h</i> 40° 58' <i>h</i> 41° 64' <i>h</i> 40° 74' <i>d</i> 39° 99' <i>d</i> 42° 00' <i>h</i> 40° 18' <i>h</i> 33° 82' <i>d</i> 38° 63' <i>h</i> 39° 28' <i>d</i> 42° 57'											<i>M</i> = 41'' 00 <i>w</i> = 3 27 $\frac{1}{w}$ = 0 31 <i>C</i> = 59° 17' 40'' 96
	42° 11' 40° 50' 41° 09' 42° 00' 40° 45' 38° 91' 44° 25' 41° 84' 40° 85' 40° 80' 41° 62' 37° 63'											
VII & IX	<i>h</i> 26° 72' <i>h</i> 25° 90' <i>h</i> 28° 54' <i>h</i> 27° 82' <i>d</i> 26° 19' <i>d</i> 27° 96' <i>d</i> 25° 49' <i>d</i> 29° 55' <i>d</i> 24° 90' <i>d</i> 23° 76' <i>d</i> 27° 11' <i>d</i> 27° 67' <i>d</i> 27° 20' <i>h</i> 27° 74' <i>d</i> 24° 94' <i>d</i> 23° 88' <i>d</i> 25° 03' <i>d</i> 31° 04' <i>d</i> 26° 95' <i>d</i> 24° 65' <i>d</i> 24° 74' <i>d</i> 24° 94' <i>d</i> 24° 17' <i>d</i> 31° 43' <i>d</i> 28° 64' <i>d</i> 25° 01' <i>d</i> 22° 54' <i>d</i> 25° 40' <i>d</i> 33° 14' <i>d</i> 25° 35' <i>d</i> 24° 71' <i>d</i> 30° 53' <i>d</i> 28° 95' <i>d</i> 29° 97'											<i>M</i> = 26'' 67 <i>w</i> = 2 58 $\frac{1}{w}$ = 0 39 <i>C</i> = 33° 10' 26'' 71
	27° 52' 26° 90' 25° 34' 25° 70' 25° 61' 30° 71' 26° 22' 26° 52' 24° 82' 24° 35' 26° 49' 29° 88'											
<i>At VI</i>												
<i>February 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>												
Angle between	Circle readings, telescope being set on VIII											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	306° 47' 125° 47' 311° 48' 181° 47' 317° 49' 137° 49' 323° 49' 143° 49' 329° 50' 149° 50' 335° 50' 155° 50'											
VIII & IX	" " " " " " " " " " " " <i>d</i> 31° 80' <i>d</i> 40° 84' <i>d</i> 38° 90' <i>d</i> 44° 07' <i>d</i> 38° 87' <i>d</i> 43° 02' <i>d</i> 45° 81' <i>d</i> 40° 10' <i>d</i> 40° 37' <i>d</i> 37° 67' <i>d</i> 45° 37' <i>d</i> 42° 15' <i>d</i> 35° 36' <i>d</i> 38° 70' <i>d</i> 41° 08' <i>d</i> 45° 99' <i>d</i> 39° 99' <i>d</i> 39° 92' <i>d</i> 43° 53' <i>d</i> 45° 30' <i>d</i> 37° 77' <i>d</i> 38° 39' <i>d</i> 40° 99' <i>d</i> 38° 59' <i>d</i> 37° 60' <i>d</i> 38° 88' <i>d</i> 39° 42' <i>d</i> 40° 28' <i>d</i> 47° 79' <i>d</i> 40° 76' <i>d</i> 41° 19' <i>d</i> 42° 31' <i>d</i> 36° 65' <i>d</i> 35° 68' <i>d</i> 39° 83' <i>d</i> 36° 85'											<i>M</i> = 40'' 51 <i>w</i> = 1 23 $\frac{1}{w}$ = 0 81 <i>C</i> = 36° 6' 40'' 46
	35° 11' 39° 47' 39° 80' 45° 03' 39° 43' 41° 07' 45° 71' 42° 05' 39° 78' 38° 03' 42° 13' 38° 56'											
IX & VII	<i>l</i> 54° 88' <i>l</i> 52° 86' <i>l</i> 53° 58' <i>l</i> 53° 74' <i>l</i> 54° 58' <i>l</i> 52° 78' <i>l</i> 50° 56' <i>l</i> 49° 70' <i>l</i> 51° 88' <i>l</i> 56° 54' <i>l</i> 52° 34' <i>l</i> 56° 46' <i>l</i> 56° 92' <i>l</i> 55° 02' <i>l</i> 53° 82' <i>l</i> 56° 22' <i>l</i> 51° 76' <i>l</i> 51° 30' <i>l</i> 49° 10' <i>l</i> 51° 38' <i>l</i> 54° 58' <i>l</i> 52° 74' <i>l</i> 53° 28' <i>l</i> 51° 08' <i>l</i> 50° 84' <i>l</i> 57° 50' <i>l</i> 52° 46' <i>l</i> 50° 12'											<i>M</i> = 53'' 07 <i>w</i> = 2 86 $\frac{1}{w}$ = 0 35 <i>C</i> = 18° 6' 53'' 09
	55° 90' 53° 94' 53° 70' 52° 73' 53° 17' 52° 04' 49° 83' 50° 54' 53° 23' 55° 59' 52° 81' 53° 33'											

At VI—(Continued.)		
<i>February 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>		
Angle between	Circle readings, telescope being set on VIII	<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	306° 47' 125° 47' 811° 48' 131° 47' 817° 49' 187° 49' 823° 49' 143° 49' 829° 50' 149° 50' 835° 50' 155° 50'	
VII & III	<p style="text-align: center;">" " " " " " " " " " "</p> <p> <i>h</i> 21' 64 <i>h</i> 15' 12 <i>h</i> 20' 82 <i>l</i> 20' 50 <i>h</i> 22' 54 <i>l</i> 19' 66 <i>l</i> 19' 70 <i>l</i> 25' 54 <i>h</i> 21' 44 <i>h</i> 20' 94 <i>h</i> 19' 36 <i>h</i> 19' 60  <i>h</i> 18' 06 <i>h</i> 19' 46 <i>h</i> 19' 50 <i>l</i> 18' 24 <i>l</i> 24' 28 <i>l</i> 26' 06 <i>l</i> 23' 02 <i>l</i> 23' 72 <i>h</i> 20' 74 <i>h</i> 23' 14 <i>h</i> 23' 16 <i>h</i> 19' 12  <i>h</i> 19' 38 <i>h</i> 18' 52 <i>l</i> 21' 62 <span style="margin-left: 150px;"><i>l</i> 24' 16 <i>l</i> 19' 14 <i>l</i> 19' 96 <i>l</i> 22' 94</span> <span style="margin-left: 100px;"><i>h</i> 17' 16 <i>h</i> 19' 40</span>  <i>h</i> 19' 44 <span style="margin-left: 100px;"><i>l</i> 23' 04</span> <span style="margin-left: 150px;"><i>l</i> 23' 48</span> <span style="margin-left: 100px;"><i>h</i> 18' 86 <i>h</i> 21' 28</span> </p> <hr/> <p style="text-align: center;">19' 63 17' 70 21' 25 19' 37 23' 41 23' 34 20' 62 23' 07 21' 71 22' 04 19' 64 19' 85</p>	<p><i>M</i> = 20'' 97</p> <p><i>w</i> = 2 87</p> <p><math>\frac{1}{w}</math> = 0 35</p> <p><i>C</i> = 80° 44' 20'' 95</p>
III & IV	<p> <i>h</i> 11' 66 <i>h</i> 12' 06 <i>l</i> 10' 20 <i>l</i> 13' 06 <i>h</i> 10' 08 <i>l</i> 15' 40 <i>l</i> 12' 94 <i>l</i> 13' 46 <i>h</i> 9' 16 <i>h</i> 13' 92 <i>h</i> 13' 16 <i>h</i> 9' 18  <i>h</i> 13' 10 <i>h</i> 11' 42 <i>l</i> 14' 66 <i>l</i> 12' 14 <i>l</i> 10' 28 <i>l</i> 12' 36 <i>l</i> 8' 88 <i>l</i> 9' 86 <i>h</i> 11' 78 <i>h</i> 12' 06 <i>h</i> 11' 32 <i>h</i> 10' 48  <i>h</i> 14' 40 <i>h</i> 11' 00 <i>l</i> 14' 74 <span style="margin-left: 150px;"><i>l</i> 12' 54 <i>l</i> 13' 28 <i>l</i> 12' 54 <i>l</i> 12' 28</span> <span style="margin-left: 100px;"><i>h</i> 11' 58 <i>h</i> 12' 60</span>  <i>h</i> 11' 02 <span style="margin-left: 100px;"><i>l</i> 14' 42</span> <span style="margin-left: 150px;"><i>h</i> 13' 26 <i>h</i> 10' 12</span> </p> <hr/> <p style="text-align: center;">12' 55 11' 49 13' 51 12' 60 10' 18 13' 43 11' 70 11' 95 11' 07 12' 99 12' 33 10' 60</p>	<p><i>M</i> = 12'' 03</p> <p><i>w</i> = 6 89</p> <p><math>\frac{1}{w}</math> = 0 15</p> <p><i>C</i> = 56° 58' 12'' 04</p>
At VII		
<i>March 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>		
Angle between	Circle readings, telescope being set on III	<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	800° 17' 120° 17' 806° 17' 126° 17' 812° 18' 182° 18' 818° 19' 188° 19' 824° 19' 144° 19' 830° 20' 150° 20'	
III & VI	<p style="text-align: center;">" " " " " " " " " " "</p> <p> <i>h</i> 20' 92 <i>h</i> 21' 64 <i>h</i> 19' 92 <i>h</i> 17' 42 <i>h</i> 24' 64 <i>h</i> 18' 22 <i>h</i> 16' 88 <i>d</i> 20' 10 <i>h</i> 18' 20 <i>d</i> 20' 14 <i>h</i> 18' 94 <i>h</i> 17' 44  <i>h</i> 19' 90 <i>h</i> 17' 82 <i>h</i> 19' 96 <i>h</i> 21' 08 <i>h</i> 17' 38 <i>h</i> 18' 56 <i>h</i> 18' 92 <i>d</i> 22' 20 <i>h</i> 19' 78 <i>d</i> 21' 74 <i>h</i> 19' 22 <i>h</i> 19' 40  <span style="margin-left: 100px;"><i>h</i> 20' 60</span>  <span style="margin-left: 100px;"><i>h</i> 21' 12</span> </p> <hr/> <p style="text-align: center;">20' 41 20' 30 19' 94 19' 25 21' 01 18' 39 17' 90 21' 15 18' 99 20' 94 19' 08 18' 42</p>	<p><i>M</i> = 19'' 65</p> <p><i>w</i> = 5 40</p> <p><math>\frac{1}{w}</math> = 0 19</p> <p><i>C</i> = 59° 44' 19'' 66</p>
VI & VIII	<p> <i>h</i> 35' 42 <i>h</i> 39' 90 <i>h</i> 32' 20 <i>h</i> 34' 00 <i>h</i> 36' 26 <i>d</i> 37' 14 <i>h</i> 34' 30 <i>h</i> 33' 68 <i>h</i> 36' 52 <i>h</i> 34' 82 <i>d</i> 37' 02 <i>h</i> 37' 08  <i>h</i> 33' 74 <i>h</i> 32' 56 <i>h</i> 32' 56 <i>h</i> 35' 52 <i>d</i> 38' 12 <i>d</i> 34' 62 <i>h</i> 33' 98 <i>h</i> 34' 18 <i>h</i> 38' 82 <i>h</i> 37' 72 <i>d</i> 34' 58 <i>h</i> 38' 44  <span style="margin-left: 100px;"><i>d</i> 33' 23</span> </p> <hr/> <p style="text-align: center;">34' 58 35' 23 32' 38 34' 76 37' 19 35' 88 34' 14 33' 93 37' 67 36' 27 35' 80 37' 76</p>	<p><i>M</i> = 35'' 47</p> <p><i>w</i> = 3 27</p> <p><math>\frac{1}{w}</math> = 0 31</p> <p><i>C</i> = 74° 47' 35'' 47</p>



At VII—(Continued.)													
<i>March 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>													
Angle between	Circle readings, telescope being set on III											M = Mean of Groups w = Relative Weight C = Concluded Angle	
	300° 17'	120° 17'	306° 17'	126° 17'	312° 18'	132° 18'	318° 19'	138° 19'	324° 19'	144° 19'	330° 20'	150° 20'	
VIII & IX	"	"	"	"	"	"	"	"	"	"	"	"	M = 45'' 59 w = 11 54 $\frac{1}{w} = 0 \cdot 09$ C = 75° 7' 45'' 60
	h46° 96	h46° 90	h47° 16	h45° 56	h46° 90	h45° 56	h43° 96	h46° 60	h44° 20	h44° 80	h45° 30	h45° 04	
	h44° 58	h47° 46	h44° 76	h47° 70	h45° 04	h44° 40	h43° 58	h46° 24	h45° 66	h45° 00	h44° 62	h46° 74	
		h46° 84					h45° 00					h44° 38	
		d44° 07										h48° 20	
	45° 77	46° 32	45° 96	46° 63	45° 97	44° 98	44° 18	46° 42	44° 93	44° 90	44° 96	46° 09	
IX & V	d66° 20	h61° 88	h65° 26	h63° 54	h64° 50	h64° 58	h67° 64	h66° 02	h63° 86	h65° 36	h62° 94	h60° 26	M = 4'' 76 w = 2 59 $\frac{1}{w} = 0 \cdot 39$ C = 106° 54' 4'' 70
	d67° 98	h62° 76	d67° 26	h64° 52	h63° 20	h67° 42	h69° 52	h64° 28	h63° 98	h63° 56	h64° 70	h64° 18	
		d64° 08							h59° 90			h59° 54	
												d65° 76	
	67° 09	62° 91	66° 26	64° 03	63° 85	66° 00	68° 58	65° 15	62° 58	64° 46	63° 82	62° 44	
V & III	h12° 88	h14° 94	h14° 88	h15° 38	h12° 42	h14° 16	h12° 50	h12° 38	h18° 16	h15° 00	h15° 52	h14° 86	M = 14'' 50 w = 3 03 $\frac{1}{w} = 0 \cdot 33$ C = 43° 26' 14'' 51
	h11° 10	h13° 70	h14° 04	h15° 92	h12° 08	h13° 84	h11° 56	h13° 60	h15° 98	h14° 88	h16° 20	h16° 62	
		d16° 08	d16° 46									d20° 17	
	11° 99	14° 91	15° 13	15° 65	12° 25	14° 00	12° 03	12° 99	17° 07	14° 94	15° 86	17° 22	
At VIII													
<i>February 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>													
Angle between	Circle readings, telescope being set on X											M = Mean of Groups w = Relative Weight C = Concluded Angle	
	197° 4'	17° 4'	208° 6'	28° 6'	209° 6'	29° 6'	215° 6'	35° 6'	221° 7'	41° 7'	227° 8'	47° 7'	
X & XI	"	"	"	"	"	"	"	"	"	"	"	"	M = 33'' 46 w = 1 84 $\frac{1}{w} = 0 \cdot 54$ C = 33° 56' 33'' 47
	h31° 44	h38° 24	h38° 86	h30° 08	l31° 98	l33° 86	h34° 84	h31° 18	l31° 18	l32° 52	l40° 38	l30° 66	
	h31° 34	h34° 74	h34° 50	h34° 28	h33° 86	l29° 40	h31° 56	h32° 72	l30° 44	l32° 00	l38° 62	l39° 40	
		h36° 22	h31° 22	h32° 70	h34° 28	l35° 80	h34° 18	h36° 70				l31° 18	
		l34° 04	h33° 14			d34° 59	h31° 66					l31° 38	
		l33° 66										d31° 23	
		d29° 94											
		d32° 78											
		d37° 50											
	31° 39	34° 64	34° 43	32° 35	33° 37	33° 41	33° 53	33° 07	30° 81	32° 26	39° 50	32° 77	

At VIII—(Continued.)														
<i>February 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>														
Angle between	Circle readings, telescope being set on X												M = Mean of Groups w = Relative Weight C = Concluded Angle	
	197° 4'	17° 4'	208° 5'	23° 5'	209° 6'	29° 6'	215° 6'	85° 6'	221° 7'	41° 7'	227° 8'	47° 7'		
XI & IX	"	"	"	"	"	"	"	"	"	"	"	"	M = 32'' 00 w = 2 35 $\frac{1}{w}$ = 0 43 C = 46° 1' 31'' 98	
	d 35° 07' l 32° 58' h 26° 24' h 33° 60' l 33° 20' l 27° 52' h 28° 56' h 31° 96' l 35° 78' l 34° 46' l 28° 38' l 33° 56'	d 35° 31' l 32° 14' h 32° 26' h 32° 50' d 31° 97' l 34° 60' d 31° 89' d 32° 63' l 33° 58' l 34° 24' l 27° 68' l 28° 84'	d 31° 41' d 26° 92' h 34° 60' h 32° 98'											
	33° 93'	31° 18'	31° 03'	33° 03'	32° 59'	31° 59'	30° 23'	32° 30'	34° 68'	34° 35'	28° 03'	31° 07'		
IX & VII	h 50° 46' h 50° 20' h 53° 72' h 53° 24' l 51° 32' l 52° 70' h 51° 00' h 53° 02' l 51° 98' l 48° 78' l 47° 78' l 49° 58'	h 47° 38' h 45° 48' h 48° 86' h 50° 60' l 52° 84' l 48° 10' h 50° 32' h 50° 88' l 49° 98' l 49° 80' l 52° 34' l 50° 72'	h 48° 52' h 48° 10' l 51° 40' l 52° 12'											M = 50'' 58 w = 4 42 $\frac{1}{w}$ = 0 23 C = 65° 32' 50'' 52
			l 50° 72' l 46° 62' l 48° 36'	l 50° 10'	l 47° 84'					l 49° 40' l 54° 94' l 52° 60'	l 54° 34' l 50° 16'			
	48° 79'	48° 57'	51° 33'	50° 54'	52° 08'	49° 55'	50° 66'	51° 95'	50° 98'	49° 33'	52° 35'	50° 77'		
VII & VI	h 48° 54' h 49° 82' h 46° 54' h 47° 10' l 46° 98' l 47° 96' h 49° 56' h 48° 26' l 50° 88' l 51° 00' l 53° 88' l 52° 68'	h 51° 36' h 55° 84' h 51° 48' h 48° 92' l 49° 74' l 53° 54' h 49° 72' h 48° 16' l 49° 06' l 47° 12' l 54° 72' l 51° 54'	h 52° 78' h 50° 82' l 56° 26' h 47° 84'											M = 49'' 92 w = 3 86 $\frac{1}{w}$ = 0 26 C = 50° 58' 50'' 04
			l 50° 14' h 52° 64' h 49° 96'	l 50° 46' h 52° 46'	l 50° 12'				l 48° 70' l 48° 40' l 46° 64' l 50° 96'	l 48° 22'	l 49° 12' l 46° 76'			
	50° 89'	51° 42'	51° 88'	48° 46'	48° 36'	50° 54'	49° 64'	48° 21'	49° 22'	48° 84'	51° 09'	50° 49'		
At IX														
<i>March 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>														
Angle between	Circle readings, telescope being set on V												M = Mean of Groups w = Relative Weight C = Concluded Angle	
	820° 5'	140° 5'	826° 6'	146° 6'	832° 7'	152° 7'	838° 8'	158° 8'	844° 8'	164° 8'	850° 9'	170° 9'		
V & VII	"	"	"	"	"	"	"	"	"	"	"	"	M = 32'' 42 w = 3 52 $\frac{1}{w}$ = 0 28 C = 39° 55' 32'' 44	
	l 34° 22' l 30° 52' h 33° 56' h 36° 98' l 30° 42' l 32° 32' h 35° 42' h 34° 50' h 32° 20' h 35° 92' h 29° 70' h 33° 26'	l 29° 20' l 32° 50' h 32° 94' h 32° 58' l 30° 10' l 31° 24' h 31° 82' h 32° 22' h 32° 36' h 30° 18' h 33° 04' h 35° 88'	l 31° 12'	l 37° 58'					h 29° 50'		h 29° 08' l 30° 34' l 33° 52'			
	31° 51'	31° 51'	33° 25'	35° 71'	30° 26'	31° 78'	32° 37'	33° 36'	32° 28'	31° 73'	31° 03'	34° 22'		

At IX—(Continued.)

March 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch  
Theodolite No. 1.

Angle between	Circle readings, telescope being set on V												$M$ = Mean of Groups $w$ = Relative Weight $C$ = Concluded Angle
	320° 5'	140° 5'	326° 6'	146° 6'	332° 7'	152° 7'	338° 8'	158° 8'	344° 8'	164° 8'	350° 9'	170° 9'	
VII & VI	"	"	"	"	"	"	"	"	"	"	"	"	$M = 45'' \cdot 89$ $w = 3 \cdot 36$ $\frac{1}{w} = 0 \cdot 30$ $C = 11^\circ 57' 45'' \cdot 96$
	h 46° 88	h 44° 58	h 46° 42	h 45° 06	h 43° 36	h 52° 78	h 43° 60	h 43° 38	h 48° 24	h 44° 66	h 49° 06	h 47° 00	
VI & VIII	h 44° 50	h 48° 30	h 46° 30	h 46° 84	h 46° 72	l 47° 76	h 41° 00	h 45° 26	h 45° 66	h 48° 70	h 45° 78	h 45° 12	$M = 41'' \cdot 94$ $w = 2 \cdot 78$ $\frac{1}{w} = 0 \cdot 36$ $C = 27^\circ 21' 41'' \cdot 93$
	h 43° 28	h 48° 44			l 48° 36	l 43° 76				h 48° 32	l 46° 30		
VIII & X	h 41° 88	h 45° 46	h 37° 74	h 42° 14	h 43° 90	h 43° 20	h 46° 42	h 44° 24	h 40° 68	h 42° 36	h 39° 74	h 40° 56	$M = 52'' \cdot 42$ $w = 5 \cdot 24$ $\frac{1}{w} = 0 \cdot 19$ $C = 43^\circ 28' 52'' \cdot 38$
	h 44° 80	h 37° 02	h 41° 02	h 41° 20	h 41° 06	l 39° 66	h 44° 54	h 44° 18	h 41° 02	h 39° 70	h 38° 82	h 41° 98	
X & XI	h 41° 28	h 41° 64			l 39° 98	l 43° 22							$M = 51'' \cdot 95$ $w = 2 \cdot 98$ $\frac{1}{w} = 0 \cdot 34$ $C = 41^\circ 38' 51'' \cdot 99$
	h 41° 28	h 41° 64			l 39° 98	l 43° 22							
VII & VI	45° 69	45° 39	47° 05	45° 95	46° 15	46° 50	42° 30	44° 32	46° 95	47° 23	47° 05	46° 06	
	43° 34	41° 25	40° 13	41° 67	41° 65	43° 08	45° 48	44° 21	40° 85	41° 03	39° 28	41° 27	
VIII & X	h 51° 94	h 53° 30	h 51° 98	h 50° 16	l 51° 24	l 53° 58	h 52° 78	h 53° 90	l 52° 76	l 50° 08	h 54° 08	h 52° 58	$M = 51'' \cdot 95$ $w = 2 \cdot 98$ $\frac{1}{w} = 0 \cdot 34$ $C = 41^\circ 38' 51'' \cdot 99$
	h 50° 78	h 55° 86	h 52° 26	h 54° 08	l 51° 46	l 49° 72	h 52° 62	h 54° 32	l 53° 72	l 53° 20	h 54° 10	h 53° 30	
X & XI	h 52° 70	h 53° 84	h 47° 22		l 50° 42				l 49° 46	l 52° 48			
	51° 36	53° 95	52° 69	50° 28	51° 35	51° 24	52° 70	54° 11	52° 43	51° 92	54° 09	52° 94	
X & XI	h 51° 28	h 48° 36	h 50° 24	h 55° 10	l 53° 30	l 50° 46	h 49° 24	h 50° 46	l 57° 94	l 52° 94	h 49° 80	h 52° 00	$M = 51'' \cdot 95$ $w = 2 \cdot 98$ $\frac{1}{w} = 0 \cdot 34$ $C = 41^\circ 38' 51'' \cdot 99$
	h 51° 02	h 50° 30	h 54° 74	h 51° 88	l 54° 88	l 56° 06	h 48° 10	h 50° 48	l 50° 80	l 52° 14	h 52° 88	h 51° 70	
X & XI	h 52° 82	h 50° 92	h 56° 28		l 52° 94				l 54° 44	l 52° 76	h 49° 78		
	51° 15	50° 49	51° 97	54° 42	54° 09	53° 15	48° 67	50° 47	53° 76	52° 61	50° 82	51° 85	

At X												
<i>February 1853, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>												
Angle between	Circle readings, telescope being set on XIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	75° 56'	255° 56'	83° 7'	263° 7'	90° 18'	270° 18'	97° 30'	277° 30'	104° 42'	284° 41'		
XIII & XIV	<i>d</i> 19° 99	<i>d</i> 19° 08	<i>l</i> 21° 08	<i>l</i> 19° 40	<i>d</i> 16° 62	<i>h</i> 19° 46	<i>h</i> 19° 92	<i>d</i> 19° 38	<i>d</i> 18° 74	<i>d</i> 18° 72	<i>M</i> = 19" 40 <i>w</i> = 9 03 $\frac{1}{w}$ = 0 11 <i>C</i> = 20° 55' 19" 40	
	<i>d</i> 19° 97	<i>d</i> 17° 68	<i>l</i> 20° 42	<i>d</i> 20° 47	<i>d</i> 17° 66	<i>d</i> 20° 19	<i>h</i> 19° 96	<i>d</i> 19° 60	<i>d</i> 18° 70	<i>d</i> 20° 16		
	19° 98	18° 79	20° 75	19° 94	17° 14	19° 83	19° 94	19° 49	18° 72	19° 44		
XIV & XII	<i>h</i> 2° 46	<i>h</i> 5° 50	<i>l</i> 3° 66	<i>l</i> 4° 14	<i>h</i> 4° 14	<i>h</i> 5° 34	<i>h</i> 3° 02	<i>h</i> 5° 38	<i>h</i> 7° 10	<i>h</i> 4° 52	<i>M</i> = 4" 70 <i>w</i> = 6 10 $\frac{1}{w}$ = 0 16 <i>C</i> = 26° 20' 4" 70	
	<i>h</i> 3° 36	<i>h</i> 6° 22	<i>l</i> 3° 24	<i>l</i> 4° 68	<i>h</i> 6° 18	<i>h</i> 6° 16	<i>h</i> 3° 56	<i>h</i> 5° 42	<i>h</i> 6° 06	<i>h</i> 3° 92		
	2° 91	5° 86	3° 45	4° 41	5° 16	5° 75	3° 29	5° 40	6° 58	4° 22		
<i>February 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>												
XII & XI	Circle readings, telescope being set on XII										<i>M</i> = 35" 54 <i>w</i> = 6 19 $\frac{1}{w}$ = 0 16 <i>C</i> = 57° 19' 35" 53	
	802° 41'	122° 41'	309° 53'	129° 53'	317° 5'	137° 5'	324° 17'	144° 17'	331° 29'	151° 29'		
	<i>h</i> 37° 90	<i>h</i> 34° 54	<i>h</i> 32° 12	<i>h</i> 35° 10	<i>h</i> 34° 32	<i>h</i> 37° 96	<i>h</i> 36° 74	<i>h</i> 34° 68	<i>h</i> 35° 26	<i>h</i> 36° 78		
	<i>h</i> 37° 34	<i>h</i> 34° 80	<i>h</i> 37° 18	<i>h</i> 33° 96	<i>h</i> 34° 10	<i>h</i> 34° 94	<i>h</i> 35° 82	<i>h</i> 34° 44	<i>h</i> 34° 30	<i>h</i> 36° 36		
			<i>h</i> 38° 56	<i>h</i> 34° 36		<i>h</i> 34° 58	<i>h</i> 34° 30	<i>h</i> 36° 46	<i>h</i> 36° 72			
			<i>h</i> 35° 46									
	37° 62	34° 67	35° 83	34° 47	34° 21	35° 83	35° 62	35° 19	35° 43	36° 57		
<i>February 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>												
XI & IX	Circle readings, telescope being set on XI										<i>M</i> = 9" 79 <i>w</i> = 2 75 $\frac{1}{w}$ = 0 36 <i>C</i> = 53° 44' 9" 82	
	806° 17'	126° 18'	312° 18'	132° 18'	318° 18'	138° 18'	324° 19'	144° 19'	330° 20'	150° 20'		336° 20'
	<i>h</i> 8° 66	<i>h</i> 14° 68	<i>h</i> 9° 32	<i>h</i> 10° 66	<i>h</i> 12° 16	<i>h</i> 7° 16	<i>h</i> 10° 18	<i>h</i> 9° 14	<i>h</i> 3° 52	<i>h</i> 7° 52	<i>h</i> 9° 20	<i>h</i> 13° 62
	<i>h</i> 9° 70	<i>h</i> 10° 92	<i>h</i> 10° 38	<i>h</i> 14° 60	<i>h</i> 9° 92	<i>h</i> 7° 42	<i>h</i> 9° 50	<i>h</i> 10° 26	<i>h</i> 8° 26	<i>h</i> 8° 20	<i>h</i> 11° 00	<i>h</i> 10° 12
		<i>h</i> 13° 98		<i>h</i> 11° 46				<i>h</i> 8° 98		<i>h</i> 7° 68	<i>h</i> 9° 96	<i>h</i> 10° 64
	9° 18	13° 19	9° 85	12° 24	11° 04	7° 29	9° 84	9° 70	6° 92	7° 86	9° 29	11° 09

At X—(Continued.)		
<i>February 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>		
Angle between	Circle readings, telescope being set on XI	$M$ = Mean of Groups $w$ = Relative Weight $C$ = Concluded Angle
	806° 17' 126° 18' 312° 18' 132° 18' 318° 18' 138° 18' 324° 19' 144° 19' 330° 20' 150° 20' 336° 20' 156° 20'	
IX & VIII	" " " " " " " " " " " "	$M = 3''\cdot96$
	h62°58 h59°76 h63°50 h61°52 h62°12 h67°92 h63°96 h66°08 h67°64 h67°68 h66°92 h59°82 h60°92 h62°58 h61°56 h61°14 h61°84 h66°82 h63°74 h65°06 h67°74 h66°98 h61°30 h63°14 h61°58 h63°64 h66°04 h63°72 h65°96 h61°56	$w = 1\cdot97$ $\frac{1}{w} = 0\cdot51$ $C = 56^{\circ}33'3''\cdot95$
	61°75 61°31 62°53 62°10 61°98 67°37 63°85 65°57 67°14 67°33 63°98 62°62	
At XI		
<i>February and March 1848, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>		
Angle between	Circle readings, telescope being set on IX	$M$ = Mean of Groups $w$ = Relative Weight $C$ = Concluded Angle
	275° 24' 95° 24' 281° 25' 101° 25' 287° 25' 107° 26' 293° 26' 113° 26' 299° 27' 119° 27' 305° 28' 125° 29'	
IX & VIII	" " " " " " " " " " " "	$M = 43''\cdot66$
	l46°76 l45°68 l41°60 l43°30 l45°48 l41°56 l43°42 l43°64 l45°76 l42°96 l46°22 l43°66 l43°94 l47°82 l42°12 l41°80 l43°12 l43°18 l40°64 l41°64 l44°44 l41°96 l44°38 l42°76 45°35 46°75 41°86 42°55 44°30 42°37 42°03 42°64 45°10 42°46 45°30 43°21	$w = 3\cdot84$ $\frac{1}{w} = 0\cdot26$ $C = 48^{\circ}50'43''\cdot66$
VIII & X	l15°52 l14°04 l16°42 l16°72 l13°66 l16°34 l19°42 l14°70 l13°48 l14°44 l18°50 l13°48 l15°16 l15°64 l15°92 l18°64 l15°08 l15°22 l18°74 l15°60 l17°48 l19°86 l14°88 l16°38 l16°54 l14°38 h14°90 l12°80 h16°70	$M = 15''\cdot91$
	15°34 14°84 16°17 17°68 14°37 15°78 19°08 15°15 15°83 16°23 16°25 14°22	$w = 4\cdot51$ $\frac{1}{w} = 0\cdot22$ $C = 35^{\circ}46'15''\cdot90$

At XI—(Continued.)											
<i>February 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on X										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	218° 19'	38° 19'	225° 30'	45° 30'	232° 42'	52° 42'	239° 54'	59° 54'	247° 6'	67° 6'	
X & XII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 11'' 10 <i>w</i> = 2 24 $\frac{1}{w}$ = 0 45 <i>C</i> = 72° 41' 11'' 08
	h 9° 24 h 10° 32	h 8° 38 h 5° 64 h 6° 20	h 13° 54 h 9° 94 h 11° 62	h 9° 62 h 11° 84	h 12° 50 h 12° 04	h 12° 16 h 11° 76	h 12° 66 h 10° 88	h 12° 18 h 9° 12 h 11° 80	h 14° 38 h 14° 92	h 10° 74 h 9° 50 h 10° 78	
	9° 78	6° 74	11° 70	10° 73	12° 27	11° 96	11° 77	11° 03	14° 65	10° 34	
XII & XVI	h 36° 52 h 34° 32	h 33° 28 h 36° 40 h 36° 04	h 35° 86 h 34° 90	h 32° 60 h 30° 50	h 34° 06 h 33° 50	h 33° 72 h 33° 34	h 36° 78 h 36° 82	h 33° 62 h 36° 70 h 35° 64	h 33° 72 h 33° 70	h 36° 58 h 36° 30 h 35° 14	<i>M</i> = 34'' 67 <i>w</i> = 3 76 $\frac{1}{w}$ = 0 27 <i>C</i> = 69° 0' 34'' 68
	35° 42	35° 24	35° 38	31° 55	33° 78	33° 53	36° 80	35° 32	33° 71	36° 01	
At XII											
* <i>February 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
† <i>January and February 1853, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 12'	187° 12'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 48'	
* XVI & XI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 43'' 99 <i>w</i> = 3 79 $\frac{1}{w}$ = 0 26 <i>C</i> = 63° 8' 43'' 97
	h 42° 86 h 45° 52 h 44° 62	h 41° 10 h 42° 36 h 42° 88 h 41° 50	h 45° 88 h 46° 48	h 46° 92 h 43° 38 d 41° 01	l 45° 54 l 44° 02	h 46° 32 h 46° 84 d 44° 52	d 40° 52 d 45° 92	l 42° 38 l 44° 92	l 44° 38 l 43° 06	h 42° 76 l 42° 10	
	44° 33	41° 96	46° 18	43° 77	44° 78	45° 89	43° 22	43° 65	43° 72	42° 43	

At XII—(Continued.)

\* February 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

† January and February 1853, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0'	180° 0'	7° 12'	187° 12'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 48'	
* XI & X	h 15'46 h 14'50 h 15'10	h 16'26 h 14'32 h 15'10	h 13'50 h 14'44	h 16'88 d 14'10	l 17'52 l 15'64 l 12'98	l 15'60 d 13'54	l 19'14 l 13'74	l 14'94 l 15'64	l 13'98 l 17'02	h 15'58 d 18'40	M = 15''38 w = 5'98 $\frac{1}{w} = 0'17$ C = 49° 59' 15''38
	14'98	15'23	13'97	15'49	15'38	14'57	16'44	15'29	15'50	16'99	
* X & XIII	h 36'84 h 36'02	h 37'58 h 38'94 h 37'62	d 37'12 d 38'38	h 32'88 h 37'46 d 37'05	l 36'88 l 36'44 l 38'82	l 36'22 l 37'46	l 34'30 l 40'08	l 37'74 l 37'40	l 37'06 l 36'12	h 34'84 d 37'66 d 35'24	M = 36''95
	36'43	38'05	37'75	35'80	37'38	36'84	37'19	37'57	36'59	35'91	
Lesser Circle-reading	147° 13'	327° 13'	154° 22'	334° 22'	161° 34'	341° 34'	168° 47'	348° 47'	175° 58'	355° 58'	w = 8'08 $\frac{1}{w} = 0'12$
+ X & XIII	h 33'34 h 34'32	h 34'82 h 35'76	h 36'06 h 36'00	h 37'96 h 36'68	h 36'76 h 35'58	l 35'00 l 36'38	h 37'32 h 37'18	h 38'02 h 38'24	h 36'26 h 34'18	l 36'28 l 35'94	C = 57° 44' 13''41 M = 36''10
	33'83	35'29	36'03	37'32	36'17	35'69	37'25	38'13	35'22	36'11	
Lesser Circle-reading	170° 53'	350° 53'	178° 5'	358° 5'	185° 17'	5° 17'	192° 29'	12° 29'	199° 41'	19° 41'	
* XIII & XIV	h 65'88 h 67'32	h 67'12 h 66'44	h 67'02 h 68'94	h 71'64 d 67'06 d 67'88	l 65'02 l 63'38	l 67'42 l 65'66	l 67'12 l 65'34	l 67'46 l 67'42	l 67'96 l 65'88	l 67'94 h 67'54	M = 6''93
	66'60	66'78	67'98	68'86	64'20	66'54	66'23	67'44	66'92	67'74	

At XII—(Continued.)

\* February 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

† January and February 1853, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	204° 57'	24° 57'	212° 7'	32° 7'	219° 19'	39° 19'	226° 32'	46° 32'	233° 43'	53° 43'	
XIII & XIV	"	"	"	"	"	"	"	"	"	"	w = 9.30 1/w = 0.11 C = 49° 22' 6".82
	h 9.16 h 5.64 h 7.60	l 8.26 l 6.46	h 7.08 h 8.06	h 5.58 h 5.56	h 5.50 h 7.28	l 7.42 l 7.00	l 5.18 l 5.42	h 3.06 h 5.52 h 5.66	h 7.54 h 6.80	l 6.62 l 7.28	
+	7.47	7.36	7.57	5.57	6.39	7.21	5.30	4.75	7.17	6.95	M = 6".57
XIV & XV	Circle readings, telescope being set on XIV										M = 41".67 w = 2.52 1/w = 0.40 C = 89° 57' 41".67
	220° 15'	40° 15'	227° 27'	47° 27'	234° 39'	54° 39'	241° 51'	61° 51'	249° 3'	69° 3'	
* XIV & XV	h 42.84 h 45.38	h 39.20 h 37.66	h 37.64 h 41.46	h 42.52 h 38.76	l 43.38 l 42.52 l 42.06	l 41.44 l 40.70	l 42.34 l 41.70	d 43.60 d 44.62	d 41.48 d 44.20	h 41.58 d 40.28 d 41.98	M = 41".67 w = 2.52 1/w = 0.40 C = 89° 57' 41".67
	44.11	38.43	39.55	40.64	42.65	41.07	42.02	44.11	42.84	41.28	
* XV & XVI	h 32.40 h 33.78 h 37.90	h 35.50 h 37.12 h 36.38	h 34.08 h 36.04	h 34.94 h 37.54 h 33.88	l 35.74 l 34.20	l 34.24 l 36.06	l 35.52 l 36.66	l 31.38 l 33.70	h 35.14 h 33.72	h 34.90 h 37.86 h 36.56 d 35.14	M = 35".08 w = 5.27 1/w = 0.19 C = 49° 47' 35".12
	34.69	36.33	35.06	35.45	34.97	35.15	36.09	32.54	34.43	36.12	



## OBSERVED ANGLES.

25—c.

At XIII											
<i>February 1853, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 8'	180° 8'	7° 12'	187° 12'	14° 24'	194° 24'	21° 37'	201° 37'	28° 48'	206° 48'	
XIV & XII	"	"	"	"	"	"	"	"	"	"	M = 24'' 29 w = 1 70 $\frac{1}{w} = 0 59$ C = 51° 59' 24'' 29
	h 20' 52	h 21' 10	h 23' 78	h 24' 14	l 23' 06	l 28' 30	h 26' 70	h 25' 10	l 26' 26	l 26' 20	
	h 21' 24	h 19' 18	h 23' 64	h 25' 20	l 23' 22	l 28' 40	h 24' 76	l 25' 86	l 23' 80	l 24' 92	
	h 20' 88	h 20' 60									
	l 20' 84	l 20' 54									
	20' 87	20' 36	23' 71	24' 67	23' 14	28' 35	25' 73	25' 48	25' 03	25' 56	
XII & X	h 61' 00	h 61' 64	h 61' 24	h 63' 76	l 63' 68	l 60' 18	h 60' 76	h 62' 88	l 60' 22	l 62' 90	M = 1'' 89 w = 6 70 $\frac{1}{w} = 0 15$ C = 75° 0' 1'' 92
	h 61' 42	h 65' 08	h 62' 44	h 62' 70	l 62' 00	l 61' 06	h 63' 94	l 60' 34	l 60' 70	l 60' 00	
		h 62' 00					h 63' 36				
	61' 21	62' 91	61' 84	63' 23	62' 84	60' 62	62' 69	61' 61	60' 46	61' 45	
At XIV											
* <i>March 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
† <i>January 1853, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	801° 48'	121° 48'	309° 2'	129° 2'	816° 13'	196° 13'	323° 26'	143° 26'	330° 38'	150° 38'	
* XV & XII	"	"	"	"	"	"	"	"	"	"	M = 48'' 02 w = 3 43 $\frac{1}{w} = 0 29$ C = 58° 10' 48'' 05
	l 46' 18	l 46' 60	h 50' 08	h 51' 34	h 52' 68	h 45' 86	h 46' 86	h 45' 72	h 49' 04	h 48' 18	
	l 46' 86	l 47' 26	h 49' 82	h 46' 80	h 45' 40	h 47' 46	h 46' 36	h 48' 82	h 49' 36	h 47' 26	
		h 51' 58	h 45' 74	h 49' 16	h 46' 30	h 46' 78	h 50' 24	h 51' 58			
	46' 52	46' 93	50' 49	47' 96	49' 08	46' 54	46' 67	49' 09	49' 20	47' 72	

At XIV—(Continued.)

\* *March 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.*

† *January 1853, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.*

Angle between	Circle readings, telescope being set on XII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 8'	180° 4'	7° 18'	187° 14'	14° 25'	184° 25'	21° 34'	201° 34'	28° 49'	206° 49'	
X & XII + XIII	"	"	"	"	"	"	"	"	"	"	M = 13'' <sup>73</sup> w = 9 <sup>87</sup> $\frac{1}{w}$ = 0 <sup>10</sup> C = 46° 33' 13'' <sup>74</sup>
	h 13 <sup>18</sup> h 15 <sup>30</sup>	h 12 <sup>00</sup> h 11 <sup>84</sup>	h 14 <sup>16</sup> h 12 <sup>86</sup>	h 13 <sup>28</sup> h 13 <sup>16</sup>	h 14 <sup>32</sup> h 13 <sup>50</sup>	h 14 <sup>94</sup> h 13 <sup>60</sup>	h 12 <sup>20</sup> h 13 <sup>20</sup>	h 14 <sup>84</sup> h 16 <sup>24</sup> h 13 <sup>92</sup>	h 13 <sup>86</sup> h 14 <sup>44</sup>	h 14 <sup>30</sup> h 14 <sup>40</sup>	
	14 <sup>24</sup>	11 <sup>92</sup>	13 <sup>51</sup>	13 <sup>22</sup>	13 <sup>91</sup>	14 <sup>27</sup>	12 <sup>70</sup>	15 <sup>00</sup>	14 <sup>15</sup>	14 <sup>35</sup>	
X & XIII + XII	h 15 <sup>74</sup> h 15 <sup>86</sup>	h 16 <sup>40</sup> h 17 <sup>78</sup>	h 15 <sup>44</sup> h 15 <sup>88</sup>	h 15 <sup>78</sup> h 15 <sup>38</sup>	h 16 <sup>16</sup> h 15 <sup>08</sup>	h 15 <sup>14</sup> h 14 <sup>30</sup>	h 16 <sup>94</sup> h 15 <sup>94</sup>	h 17 <sup>42</sup> h 14 <sup>54</sup> h 16 <sup>70</sup>	h 14 <sup>80</sup> h 15 <sup>24</sup>	h 15 <sup>04</sup> h 15 <sup>12</sup>	M = 15'' <sup>72</sup> w = 14 <sup>64</sup> $\frac{1}{w}$ = 0 <sup>07</sup> C = 32° 5' 15'' <sup>72</sup>
	15 <sup>80</sup>	17 <sup>09</sup>	15 <sup>66</sup>	15 <sup>58</sup>	15 <sup>62</sup>	14 <sup>72</sup>	16 <sup>44</sup>	16 <sup>22</sup>	15 <sup>02</sup>	15 <sup>08</sup>	

At XV

\* *January 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.*

† *March and May 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.*

Angle between	Circle readings, telescope being set on XVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	321° 7'	141° 7'	328° 18'	148° 18'	335° 30'	155° 30'	342° 42'	162° 42'	349° 54'	169° 54'	
XVII & XVIII * XVII	"	"	"	"	"	"	"	"	"	"	M = 46'' <sup>95</sup> w = 1 <sup>62</sup> $\frac{1}{w}$ = 0 <sup>62</sup> C = 38° 53' 46'' <sup>97</sup>
	h 47 <sup>16</sup> h 48 <sup>96</sup>	h 47 <sup>56</sup> h 46 <sup>70</sup>	h 48 <sup>60</sup> h 45 <sup>08</sup> h 45 <sup>42</sup>	h 44 <sup>84</sup> h 46 <sup>28</sup>	h 49 <sup>60</sup> h 54 <sup>70</sup> h 47 <sup>88</sup> h 53 <sup>26</sup>	h 42 <sup>42</sup> h 42 <sup>80</sup>	h 46 <sup>78</sup> h 47 <sup>40</sup>	h 45 <sup>44</sup> h 47 <sup>22</sup>	h 48 <sup>94</sup> h 48 <sup>90</sup>	h 44 <sup>78</sup> h 47 <sup>38</sup>	
	48 <sup>06</sup>	47 <sup>13</sup>	46 <sup>37</sup>	45 <sup>56</sup>	51 <sup>36</sup>	42 <sup>61</sup>	47 <sup>09</sup>	46 <sup>33</sup>	48 <sup>92</sup>	46 <sup>08</sup>	



OBSERVED ANGLES.

27—c.

At XV—(Continued.)

\* January 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.

† March and May 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	284° 9'	104° 9'	291° 21'	111° 21'	298° 33'	118° 33'	306° 45'	125° 45'	312° 57'	132° 58'	
+ XVII & XVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 40" 58 <i>w</i> = 4 95 $\frac{1}{w}$ = 0 20 <i>C</i> = 75° 51' 40" 57
	h 41' 62 h 39' 92 h 43' 48	h 42' 82 h 40' 24 h 43' 48	l 40' 14 l 40' 74	l 40' 82 l 41' 64	l 37' 94 l 38' 94 l 39' 88 l 42' 04	l 39' 54 l 39' 04	l 38' 04 l 40' 96	l 41' 30 l 40' 44	l 34' 88 l 42' 02 l 39' 90 h 40' 00 h 40' 44	h 41' 74 h 43' 24 h 41' 98	
	40' 77	42' 18	40' 44	41' 23	39' 70	39' 29	39' 50	40' 87	39' 45	42' 32	
+ XVI & XII	h 11' 58 h 14' 02	h 11' 04 h 10' 36	h 13' 82 h 12' 54	h 14' 70 h 10' 14 h 18' 24 h 13' 52 h 15' 92	h 17' 40 h 14' 76 h 13' 70	h 13' 34 h 14' 48 h 14' 26	l 13' 42 l 14' 94	l 11' 96 l 16' 46 l 13' 70 l 18' 78 l 15' 32 l 11' 36 l 15' 24	l 12' 96 l 18' 28 l 14' 08 l 14' 10	h 15' 92 h 15' 62 h 11' 72 h 14' 04 h 14' 52 h 14' 96	<i>M</i> = 13" 87 <i>w</i> = 3 48 $\frac{1}{w}$ = 0 29 <i>C</i> = 72° 32' 14" 00
	12' 80	10' 70	13' 18	14' 50	15' 29	14' 03	14' 18	14' 69	14' 86	14' 46	
	h 33' 18 h 33' 54	h 32' 44 h 30' 78	h 31' 40 h 32' 00	h 31' 28 h 33' 04	h 31' 52 h 33' 64	l 34' 50 l 32' 30 l 35' 56 l 38' 74	l 33' 98 l 31' 68	l 37' 64 l 34' 38 l 31' 98 l 28' 90 l 36' 30 l 33' 46 l 32' 02	l 31' 24 l 29' 46 l 31' 36 l 31' 82	l 35' 14 l 33' 38	
+ XII & XIV	33' 36	31' 61	31' 70	32' 16	32' 58	35' 28	32' 83	33' 53	30' 97	34' 26	<i>M</i> = 32" 83 <i>w</i> = 3 43 $\frac{1}{w}$ = 0 29 <i>C</i> = 31° 51' 32" 88

## At XVI

April 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch  
Theodolite No. 1.

Angle between	Circle readings, telescope being set on XI										$M$ = Mean of Groups $w$ = Relative Weight $C$ = Concluded Angle
	16° 28'	196° 28'	28° 40'	203° 40'	30° 52'	210° 51'	38° 4'	218° 4'	45° 16'	225° 16'	
XI & XII	"	"	"	"	"	"	"	"	"	"	$M = 45'' \cdot 59$ $w = 2 \cdot 23$ $\frac{1}{w} = 0 \cdot 45$ $C = 47^\circ 50' 45'' \cdot 56$
	h 44' 78 h 45' 22	h 42' 78 h 42' 08	h 48' 40 h 46' 76	h 46' 48 h 47' 60	h 48' 18 h 44' 82	h 48' 88 d 48' 88	d 45' 22 d 46' 16	h 47' 00 d 44' 15	h 41' 78 h 43' 20 h 44' 32	h 43' 44 h 45' 92 h 41' 98 h 43' 14	
	45' 00	42' 93	47' 58	47' 04	46' 50	48' 88	45' 69	45' 58	43' 10	43' 62	
XII & XV	h 16' 64 h 14' 78	h 15' 60 h 15' 64	h 11' 94 h 12' 54	h 11' 94 h 12' 54	h 11' 96 h 12' 64 h 14' 14 h 13' 54	h 9' 26 d 9' 26	h 13' 36 h 12' 32	h 14' 56 h 14' 02	h 15' 12 h 15' 98 h 14' 22	h 15' 22 h 13' 00 h 13' 10 h 17' 58	$M = 13'' \cdot 58$ $w = 2 \cdot 66$ $\frac{1}{w} = 0 \cdot 38$ $C = 57^\circ 40' 13'' \cdot 58$
	15' 71	15' 62	12' 24	12' 24	13' 07	9' 94	12' 84	14' 29	15' 11	14' 73	
XV & XVII	h 30' 48 h 30' 04	h 30' 36 h 25' 46	h 29' 70 h 26' 28	h 31' 54 h 26' 52	h 26' 16 h 26' 46 d 29' 26	h 26' 50 h 28' 00	d 29' 08 d 29' 30	h 26' 72 d 25' 28	h 28' 74 h 30' 26	h 30' 16 h 28' 98 h 30' 22 h 25' 42 d 29' 65	$M = 28'' \cdot 33$ $w = 3 \cdot 69$ $\frac{1}{w} = 0 \cdot 27$ $C = 47^\circ 10' 28'' \cdot 33$
	30' 26	27' 91	27' 99	29' 03	27' 29	27' 25	29' 19	26' 00	29' 50	28' 89	
XVII & XIX	h 31' 62 h 31' 34 h 27' 62 h 29' 00	h 27' 74 h 32' 12 h 31' 48 h 32' 62	h 30' 18 h 31' 66 h 30' 64	h 28' 86 h 32' 20 h 27' 92 h 29' 50	h 29' 22 h 31' 16 d 33' 14	h 34' 46 h 32' 38 d 35' 47	h 31' 38 h 30' 52	h 32' 30 h 34' 14 h 31' 42	h 29' 20 h 26' 56 h 32' 64 h 28' 64	h 29' 68 h 28' 22 h 28' 58 h 30' 16 d 30' 11	$M = 30'' \cdot 88$ $w = 3 \cdot 33$ $\frac{1}{w} = 0 \cdot 30$ $C = 37^\circ 55' 30'' \cdot 83$
	29' 90	30' 99	30' 83	29' 62	31' 17	34' 10	30' 95	32' 62	29' 26	29' 35	

## At XVII

January 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch  
Theodolite No. 2.

Angle between	Circle readings, telescope being set on XV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 37'	28° 48'	208° 48'	
XVIII & XIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 17''·35 <i>w</i> = 1·45 $\frac{1}{w}$ = 0·69 <i>C</i> = 83° 11' 17''·33
	l 18·40	l 13·02	h 14·08	h 16·94	h 14·82	h 15·32	h 20·52	h 20·10	h 20·28	h 13·30	
XV & XVIII	l 18·68	l 17·32	h 13·86	h 20·74	h 16·34	h 18·98	h 21·52	h 20·28	h 16·74	h 15·98	<i>M</i> = 31''·86 <i>w</i> = 1·83 $\frac{1}{w}$ = 0·55 <i>C</i> = 57° 33' 31''·84
		l 13·60		h 20·02		h 15·66			h 16·94	d 16·29	
XVIII & XIX	18·54	14·65	13·97	19·23	15·58	16·65	21·02	20·19	18·44	15·19	<i>M</i> = 38''·96 <i>w</i> = 2·02 $\frac{1}{w}$ = 0·50 <i>C</i> = 46° 11' 38''·97
									h 19·78		
XX & XXI	l 29·76	l 38·70	h 33·34	h 30·16	h 36·10	h 32·40	h 30·66	h 29·48	h 29·46	h 30·44	<i>M</i> = 18''·85 <i>w</i> = 3·66 $\frac{1}{w}$ = 0·27 <i>C</i> = 54° 26' 18''·86
	l 30·86	l 31·84	h 33·60	h 30·18	h 34·76	h 30·44	h 28·52	h 31·08	h 33·68	h 30·94	
XX & XXI	30·31	35·27	33·47	29·97	35·43	31·47	29·59	30·28	31·57	31·24	<i>M</i> = 18''·85 <i>w</i> = 3·66 $\frac{1}{w}$ = 0·27 <i>C</i> = 54° 26' 18''·86
				h 29·58		h 31·56				d 32·34	
XX & XXI	l 40·10	l 37·32	h 39·20	h 39·44	h 37·34	h 39·32	h 42·64	h 40·42	h 37·40	h 40·16	<i>M</i> = 18''·85 <i>w</i> = 3·66 $\frac{1}{w}$ = 0·27 <i>C</i> = 54° 26' 18''·86
	l 39·38	l 41·20	h 38·56	h 39·56	h 34·26	h 40·74	h 43·18	h 36·08	h 33·96	h 39·16	
XX & XXI	39·74	39·26	38·88	39·62	35·80	39·82	42·91	38·25	35·68	39·66	<i>M</i> = 18''·85 <i>w</i> = 3·66 $\frac{1}{w}$ = 0·27 <i>C</i> = 54° 26' 18''·86
				h 39·86		h 39·40					

May 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch  
Theodolite No. 1.

Angle between	Circle readings, telescope being set on XXI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	186° 57'	6° 57'	194° 9'	14° 9'	201° 21'	21° 21'	206° 33'	28° 33'	215° 45'	35° 45'	
XXI & XIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 18''·85 <i>w</i> = 3·66 $\frac{1}{w}$ = 0·27 <i>C</i> = 54° 26' 18''·86
	h 17·46	h 19·34	h 17·70	h 22·80	h 20·68	h 21·94	h 17·26	h 17·06	h 20·14	h 18·50	
XXI & XIX	h 18·46	h 18·70	h 17·90	h 15·90	h 19·96	h 21·16	h 16·72	d 16·64	h 17·78	h 18·74	<i>M</i> = 18''·85 <i>w</i> = 3·66 $\frac{1}{w}$ = 0·27 <i>C</i> = 54° 26' 18''·86
					h 18·54		h 22·96				
XXI & XIX	17·96	19·02	17·80	19·35	19·73	21·55	18·70	16·85	18·96	18·62	<i>M</i> = 18''·85 <i>w</i> = 3·66 $\frac{1}{w}$ = 0·27 <i>C</i> = 54° 26' 18''·86
							h 17·86				

At XVII—(Continued.)

May 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XXI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	186° 57'	6° 57'	194° 9'	14° 9'	201° 21'	21° 21'	206° 33'	28° 33'	215° 45'	35° 45'	
XIX & XVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 19''·02 <i>w</i> = 2·80 $\frac{1}{w}$ = 0·36 <i>C</i> = 61° 39' 19''·02
	<i>d</i> 16·63 <i>d</i> 20·17	<i>d</i> 19·30 <i>d</i> 16·88	<i>d</i> 18·97 <i>d</i> 17·87	<i>d</i> 13·00 <i>d</i> 19·40 <i>d</i> 19·68	<i>d</i> 16·16 <i>d</i> 20·26	<i>d</i> 20·14 <i>d</i> 21·82	<i>h</i> 22·42 <i>h</i> 20·32 <i>d</i> 19·03	<i>d</i> 18·94 <i>d</i> 22·38	<i>h</i> 18·12 <i>h</i> 21·98	<i>h</i> 15·98 <i>d</i> 18·82	
XVI & XV	<i>h</i> 53·46 <i>h</i> 53·08	<i>h</i> 53·62 <i>h</i> 56·04	<i>h</i> 55·46 <i>h</i> 51·46 <i>h</i> 55·88	<i>h</i> 56·76 <i>h</i> 56·72	<i>h</i> 52·50 <i>h</i> 53·34	<i>h</i> 51·30 <i>h</i> 49·50	<i>h</i> 53·48 <i>h</i> 55·90 <i>d</i> 52·35	<i>h</i> 54·70 <i>h</i> 53·22	<i>h</i> 55·28 <i>h</i> 53·26	<i>h</i> 55·80 <i>h</i> 52·26 <i>h</i> 53·66	<i>M</i> = 53''·85 <i>w</i> = 3·09 $\frac{1}{w}$ = 0·32 <i>C</i> = 56° 57' 53''·86
	53·27	54·83	54·27	56·74	52·92	50·40	53·91	53·96	54·27	53·91	

At XVIII

January 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.

Angle between	Lesser Circle-reading										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	359° 4'	179° 4'	6° 16'	186° 16'	13° 28'	193° 28'	20° 40'	200° 40'	27° 52'	207° 52'	
XX & R M	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 36''·11
	<i>l</i> 35·84 <i>l</i> 39·50 <i>d</i> 32·62 <i>d</i> 35·66 <i>d</i> 39·72 <i>d</i> 36·54	<i>l</i> 36·48 <i>l</i> 36·22	<i>h</i> 35·36 <i>l</i> 33·62 <i>l</i> 42·56 <i>h</i> 39·54 <i>h</i> 36·72 <i>h</i> 35·34	<i>h</i> 33·20 <i>h</i> 40·10 <i>l</i> 34·32 <i>h</i> 32·82 <i>h</i> 32·96	<i>h</i> 37·00 <i>h</i> 37·04	<i>h</i> 33·32 <i>h</i> 32·88	<i>h</i> 42·42 <i>h</i> 37·88	<i>h</i> 34·34 <i>h</i> 32·84 <i>d</i> 31·75	<i>l</i> 40·44 <i>l</i> 41·24 <i>h</i> 39·34 <i>h</i> 39·66 <i>h</i> 40·48 <i>h</i> 36·10	36·65 36·35 37·19 34·68 37·02 33·10 40·15 32·98 39·54 33·48	

## At XVIII—(Continued.)

January 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch  
Theodolite No. 2.

Angle between	Lesser Circle-reading										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	270° 51'	90° 51'	278° 3'	98° 3'	285° 15'	105° 15'	292° 27'	112° 27'	299° 39'	119° 39'		
XX & R M	"	"	"	"	"	"	"	"	"	"	<i>w</i> = 2.94 <i>I</i> = 0.34 <i>w</i> <i>C</i> = 0° 56' 36".03	
	<i>h</i> 35.16 <i>h</i> 38.26 <i>h</i> 35.92 <i>h</i> 36.02 <i>h</i> 37.24	<i>h</i> 34.10 <i>h</i> 35.90 <i>h</i> 35.92 <i>h</i> 36.02 <i>h</i> 37.24	<i>h</i> 39.52 <i>h</i> 37.06 <i>h</i> 41.54 <i>d</i> 36.15 <i>d</i> 36.61 <i>d</i> 36.83	<i>h</i> 35.64 <i>h</i> 34.80	<i>h</i> 40.04 <i>h</i> 39.00	<i>h</i> 35.50 <i>h</i> 33.64	<i>h</i> 39.92 <i>h</i> 36.14 <i>h</i> 36.28	<i>h</i> 32.30 <i>h</i> 32.50 <i>h</i> 33.48	<i>h</i> 35.32 <i>h</i> 39.38 <i>h</i> 35.16 <i>h</i> 33.90 <i>h</i> 37.26 <i>h</i> 36.68	<i>h</i> 33.58 <i>h</i> 33.74 <i>h</i> 33.38 <i>h</i> 31.16 <i>h</i> 32.20		<i>h</i> 36.71 <i>h</i> 35.84 <i>h</i> 37.95 <i>h</i> 35.22 <i>h</i> 40.02 <i>h</i> 34.57 <i>h</i> 37.45 <i>h</i> 32.76 <i>h</i> 36.28 <i>h</i> 32.81
Lesser Circle-reading	0° 0'	180° 0'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	<i>M</i> = 24".30	
R M & XVII	<i>l</i> 20.08 <i>l</i> 20.24 <i>d</i> 15.11 <i>d</i> 18.15 <i>d</i> 22.21 <i>d</i> 19.03	<i>l</i> 27.64 <i>l</i> 26.60 <i>l</i> 14.64 <i>h</i> 16.56 <i>h</i> 23.50 <i>h</i> 21.42	<i>h</i> 24.30 <i>l</i> 20.70 <i>l</i> 14.64 <i>h</i> 16.56 <i>h</i> 23.50 <i>h</i> 21.42	<i>h</i> 30.22 <i>l</i> 24.68 <i>h</i> 29.08 <i>h</i> 27.58	<i>h</i> 20.86 <i>h</i> 22.26 <i>h</i> 27.85	<i>h</i> 26.74 <i>h</i> 29.38 <i>h</i> 27.44 <i>h</i> 24.64	<i>h</i> 19.72 <i>h</i> 25.72 <i>h</i> 26.36 <i>h</i> 24.64	<i>h</i> 28.16 <i>h</i> 26.10 <i>d</i> 25.29 <i>h</i> 24.64	<i>l</i> 15.74 <i>l</i> 17.98 <i>h</i> 23.46 <i>h</i> 23.58 <i>h</i> 20.00 <i>h</i> 26.50	<i>h</i> 27.00 <i>h</i> 28.12 <i>h</i> 23.46 <i>h</i> 23.58 <i>h</i> 20.00 <i>h</i> 26.50		19.14 27.12 20.19 27.72 21.56 27.85 24.11 26.52 21.21 27.56
Lesser Circle-reading	271° 48'	91° 48'	279° 0'	99° 0'	286° 12'	106° 12'	293° 24'	113° 24'	300° 36'	120° 36'	<i>w</i> = 1.83 <i>I</i> = 0.55 <i>w</i> <i>C</i> = 88° 12' 24".60	
R M & XVII	<i>h</i> 23.56 <i>h</i> 24.16 <i>h</i> 29.46 <i>h</i> 23.04 <i>h</i> 27.70 <i>h</i> 26.44	<i>h</i> 27.48 <i>h</i> 24.56 <i>h</i> 29.46 <i>h</i> 23.04 <i>h</i> 27.70 <i>h</i> 26.44	<i>h</i> 26.94 <i>h</i> 24.66 <i>h</i> 26.96 <i>d</i> 22.97 <i>d</i> 23.43 <i>d</i> 23.65	<i>h</i> 25.04 <i>h</i> 25.44 <i>h</i> 22.96	<i>h</i> 20.82 <i>h</i> 22.96	<i>h</i> 26.94 <i>h</i> 28.34	<i>h</i> 15.26 <i>h</i> 19.72 <i>h</i> 24.04 <i>h</i> 26.14 <i>h</i> 27.66	<i>h</i> 26.84 <i>h</i> 30.08 <i>h</i> 24.72 <i>h</i> 26.14 <i>h</i> 27.66	<i>h</i> 16.22 <i>h</i> 21.84 <i>h</i> 19.34 <i>h</i> 20.38 <i>h</i> 22.18 <i>h</i> 22.24	<i>h</i> 25.40 <i>h</i> 31.36 <i>h</i> 29.40 <i>h</i> 29.22 <i>h</i> 29.90		23.86 26.45 24.77 25.24 21.89 27.64 22.56 27.21 20.37 29.06

At XVIII—(Continued.)											
<i>January 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	88° 18'	268° 18'	95° 25'	275° 25'	102° 37'	282° 37'	109° 48'	289° 48'	117° 1'	297° 1'	
XVII & XV	"	"	"	"	"	"	"	"	"	"	M = 55".86
	l 57.58 l 54.84	l 54.70 l 58.04 l 60.46	h 54.72 l 57.78 l 60.82 h 60.98 h 58.78 h 60.38	h 52.24 h 56.62 l 58.66 h 56.54 h 57.08	h 53.54 h 52.08	h 55.76 h 52.58	h 54.20 h 51.38	h 57.06 h 57.60	l 59.06 h 53.66 h 55.42 h 59.72	h 54.34 h 56.60	
	56.21	57.73	58.91	56.23	52.81	54.17	52.79	57.33	56.97	55.47	
Lesser Circle-reading	0° 0'	180° 0'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	206° 48'	
XVII & XV	h 54.64 h 54.18	h 54.48 h 53.98 h 52.32 h 55.28	h 46.62 h 55.96 h 45.24 h 49.48 h 55.74 h 54.78	h 54.98 h 56.06	h 57.64 h 55.40	h 54.06 h 54.90	h 61.24 h 55.10 h 53.82 h 51.28 h 50.60	h 55.72 h 52.80 h 56.76	h 56.70 h 56.06 h 58.40 h 67.06 h 56.54 h 54.04	h 60.56 h 54.70 h 56.80 h 57.80 h 58.68	w = 3.22 1/w = 0.31 C = 57° 54' 55".61
	54.41	54.02	51.30	55.52	56.52	54.48	54.41	55.09	58.13	57.71	M = 55".16
At XIX											
<i>April 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	195° 44'	15° 44'	202° 56'	22° 56'	210° 8'	30° 8'	217° 20'	37° 20'	224° 32'	44° 32'	
XVI & XVII	"	"	"	"	"	"	"	"	"	"	M = 11".73 w = 3.66 1/w = 0.27 C = 80° 25' 11".74
	h 10.10 l 8.58	l 12.86 l 13.56	l 11.44 l 12.70	l 11.22 l 13.86 l 14.10	l 11.58 l 13.06	l 10.90 l 11.50	l 9.96 l 13.12 l 12.78 l 13.64	l 13.16 l 10.96	l 14.82 l 13.90 l 11.60 l 10.22	l 7.52 l 10.62 l 8.92	
	9.34	13.21	12.07	13.06	12.32	11.20	12.38	12.06	12.64	9.02	



## At XIX—(Continued.)

April 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	195° 44'	15° 44'	202° 56'	22° 56'	210° 8'	30° 8'	217° 20'	37° 20'	224° 32'	44° 32'	
XVII & XXI	"	"	"	"	"	"	"	"	"	"	M = 11" 95 w = 3 00 $\frac{1}{w} = 0 33$ C = 83° 51' 11" 95
	h 13' 16 l 14' 44	l 13' 40 l 12' 38	l 12' 84 l 11' 80	l 13' 90 l 12' 98 l 13' 52	l 12' 62 l 12' 52	l 6' 88 l 9' 72	l 9' 92 l 10' 22 l 11' 16	l 10' 36 l 11' 94	l 8' 12 l 12' 26 l 13' 38 l 13' 02	l 15' 08 l 11' 32 l 12' 32	
	13' 80	12' 89	12' 32	13' 47	12' 57	8' 30	10' 43	11' 15	11' 70	12' 91	

## At XX

February 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.

Angle between	Circle readings, telescope being set on XXIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	114° 24'	294° 24'	121° 36'	301° 36'	125° 48'	308° 49'	136° 0'	316° 0'	148° 13'	323° 12'	
XXIII & XXIV	"	"	"	"	"	"	"	"	"	"	M = 59" 40 w = 1 11 $\frac{1}{w} = 0 90$ C = 50° 38' 59" 41
	h 56' 04 h 56' 60	h 55' 02 d 54' 00	l 62' 04 d 64' 69	d 60' 90 d 56' 86	h 62' 58 h 59' 70	h 62' 66 h 62' 14 h 58' 22	h 61' 26 h 60' 74	h 60' 68 h 62' 22	l 58' 32 d 54' 69	h 59' 36 h 60' 20	
	56' 32	54' 51	63' 37	58' 88	61' 14	61' 01	61' 00	61' 45	56' 51	59' 78	
XXIV & XXII	h 38' 06 h 37' 52	h 39' 02 h 37' 50	l 37' 86 l 39' 58	l 35' 40 l 38' 54	h 40' 86 h 38' 68	h 32' 08 h 33' 56	h 37' 42 h 35' 78	h 35' 62 h 36' 14	l 39' 96 l 37' 10	h 34' 84 h 34' 70	M = 37" 01 w = 2 10 $\frac{1}{w} = 0 48$ C = 45° 49' 37" 01
	37' 79	38' 26	38' 72	36' 97	39' 77	32' 82	36' 60	35' 88	38' 53	34' 77	

At XX—(Continued.)											
<i>February 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	114° 24'	204° 21'	121° 36'	301° 36'	128° 48'	308° 49'	136° 0'	316° 0'	143° 13'	323° 12'	
XXII & XXI	<i>h</i> 33° 94'	<i>h</i> 35° 90'	<i>l</i> 33° 78'	<i>l</i> 33° 60'	<i>h</i> 29° 88'	<i>h</i> 35° 00'	<i>h</i> 35° 40'	<i>h</i> 34° 18'	<i>l</i> 35° 46'	<i>h</i> 36° 14'	<i>M</i> = 34''·65 <i>w</i> = 3·33 $\frac{I}{w}$ = 0·30 <i>C</i> = 55° 4' 34''·64
	<i>h</i> 35° 38'	<i>h</i> 34° 84'	<i>l</i> 32° 50'	<i>l</i> 31° 62'	<i>h</i> 34° 36'	<i>h</i> 34° 88'	<i>h</i> 35° 56'	<i>h</i> 32° 66'	<i>l</i> 38° 12'	<i>h</i> 37° 74'	
	34° 66'	35° 37'	33° 14'	32° 61'	33° 16'	34° 94'	35° 48'	33° 42'	36° 79'	36° 94'	
XXI & XVII	<i>h</i> 38° 88'	<i>h</i> 37° 36'	<i>l</i> 37° 26'	<i>l</i> 41° 24'	<i>h</i> 38° 60'	<i>h</i> 36° 32'	<i>h</i> 36° 94'	<i>h</i> 35° 54'	<i>l</i> 38° 18'	<i>h</i> 36° 66'	<i>M</i> = 37''·56 <i>w</i> = 4·03 $\frac{I}{w}$ = 0·25 <i>C</i> = 60° 45' 37''·56
	<i>d</i> 38° 90'	<i>h</i> 37° 98'	<i>l</i> 36° 60'	<i>l</i> 40° 62'	<i>h</i> 35° 48'	<i>h</i> 36° 62'	<i>h</i> 36° 74'	<i>h</i> 37° 46'	<i>l</i> 35° 60'	<i>h</i> 36° 04'	
	38° 89'	37° 67'	36° 93'	40° 93'	38° 08'	36° 47'	36° 84'	36° 50'	36° 89'	36° 35'	
XVII & XVIII	<i>h</i> 31° 84'	<i>h</i> 28° 88'	<i>l</i> 28° 98'	<i>l</i> 25° 70'	<i>h</i> 30° 64'	<i>h</i> 27° 92'	<i>h</i> 30° 72'	<i>h</i> 28° 18'	<i>l</i> 28° 80'	<i>h</i> 29° 44'	<i>M</i> = 29''·66 <i>w</i> = 2·82 $\frac{I}{w}$ = 0·35 <i>C</i> = 33° 17' 29''·68
	<i>h</i> 31° 96'	<i>h</i> 29° 56'	<i>l</i> 30° 14'	<i>l</i> 27° 88'	<i>h</i> 33° 44'	<i>h</i> 30° 14'	<i>h</i> 29° 14'	<i>h</i> 28° 62'	<i>l</i> 30° 26'	<i>h</i> 28° 94'	
	31° 90'	29° 22'	29° 56'	26° 79'	33° 08'	29° 03'	29° 93'	28° 40'	29° 53'	29° 19'	
At XXI											
<i>April 1849, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
XIX & XVII	<i>l</i> 32° 78'	<i>l</i> 33° 18'	<i>h</i> 32° 22'	<i>h</i> 32° 36'	<i>h</i> 33° 62'	<i>h</i> 31° 40'	<i>h</i> 32° 00'	<i>h</i> 30° 34'	<i>h</i> 31° 26'	<i>h</i> 30° 76'	<i>M</i> = 31''·21 <i>w</i> = 6·37 $\frac{I}{w}$ = 0·16 <i>C</i> = 41° 42' 31''·12
	<i>l</i> 30° 94'	<i>l</i> 30° 30'	<i>h</i> 32° 16'	<i>h</i> 31° 56'	<i>h</i> 31° 80'	<i>h</i> 27° 42'	<i>h</i> 30° 92'	<i>h</i> 30° 94'	<i>h</i> 28° 02'	<i>h</i> 28° 92'	
		<i>l</i> 29° 30'				<i>h</i> 31° 26'			<i>h</i> 29° 64'	<i>h</i> 29° 44'	
		<i>l</i> 29° 30'				<i>h</i> 32° 98'			<i>h</i> 32° 36'	<i>h</i> 29° 94'	
	31° 86'	30° 52'	32° 19'	31° 96'	32° 71'	30° 77'	31° 46'	30° 64'	30° 24'	29° 71'	

At XXI—(Continued.)											
<i>February 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	224° 42'	44° 42'	231° 54'	51° 54'	239° 7'	56° 7'	246° 18'	66° 18'	253° 30'	73° 30'	
XVII & XX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 45'' 92 <i>w</i> = 6 37 $\frac{1}{w}$ = 0 16 <i>C</i> = 73° 2' 45'' 91
	<i>h</i> 46' 36	<i>h</i> 45' 30	<i>d</i> 45' 97	<i>h</i> 44' 02	<i>l</i> 46' 86	<i>l</i> 45' 10	<i>h</i> 45' 78	<i>h</i> 46' 70	<i>h</i> 48' 00	<i>h</i> 47' 72	
	<i>h</i> 44' 36	<i>h</i> 46' 74	<i>d</i> 48' 49	<i>h</i> 43' 38	<i>l</i> 43' 52	<i>l</i> 45' 84	<i>h</i> 47' 02	<i>h</i> 46' 18	<i>h</i> 45' 26	<i>h</i> 46' 26	
				<i>d</i> 44' 61							
	45' 36	46' 02	47' 23	43' 70	45' 00	45' 47	46' 40	46' 44	46' 63	46' 99	
XX & XXIV	<i>h</i> 11' 22	<i>h</i> 13' 88	<i>h</i> 10' 94	<i>h</i> 13' 08	<i>l</i> 14' 24	<i>l</i> 14' 18	<i>h</i> 9' 04	<i>h</i> 10' 62	<i>h</i> 11' 72	<i>h</i> 9' 32	<i>M</i> = 11'' 96 <i>w</i> = 3 71 $\frac{1}{w}$ = 0 27 <i>C</i> = 43° 39' 11'' 97
	<i>h</i> 12' 66	<i>h</i> 12' 94	<i>h</i> 10' 80	<i>h</i> 11' 98	<i>l</i> 14' 34	<i>l</i> 13' 56	<i>h</i> 9' 86	<i>h</i> 11' 30	<i>h</i> 13' 18	<i>h</i> 10' 80	
					<i>d</i> 13' 71						
	11' 94	13' 41	10' 87	12' 53	14' 10	13' 87	9' 45	10' 96	12' 45	10' 06	
XXIV & XXII	<i>d</i> 61' 42	<i>d</i> 62' 13	<i>d</i> 62' 81	<i>d</i> 61' 63	<i>d</i> 64' 40	<i>d</i> 62' 76	<i>d</i> 62' 39	<i>d</i> 63' 42	<i>d</i> 61' 26	<i>d</i> 63' 31	<i>M</i> = 2'' 25 <i>w</i> = 9 30 $\frac{1}{w}$ = 0 11 <i>C</i> = 18° 36' 2'' 25
	<i>d</i> 61' 16	<i>d</i> 63' 93	<i>d</i> 62' 85	<i>d</i> 60' 85	<i>d</i> 59' 44	<i>d</i> 61' 16	<i>d</i> 64' 31	<i>d</i> 61' 68	<i>d</i> 62' 02	<i>d</i> 61' 97	
	61' 29	63' 03	62' 83	61' 24	61' 92	61' 96	63' 35	62' 55	61' 64	62' 64	
At XXII											
<i>February 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 12'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
XXI & XX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 13'' 90 <i>w</i> = 1 83 $\frac{1}{w}$ = 0 55 <i>C</i> = 62° 40' 13'' 90
	<i>h</i> 12' 36	<i>h</i> 12' 44	<i>h</i> 17' 14	<i>l</i> 14' 56	<i>h</i> 15' 76	<i>h</i> 12' 50	<i>h</i> 18' 80	<i>h</i> 11' 84	<i>h</i> 14' 68	<i>h</i> 17' 84	
	<i>h</i> 12' 36	<i>h</i> 12' 40	<i>h</i> 9' 56	<i>l</i> 14' 00	<i>h</i> 13' 90	<i>h</i> 11' 38	<i>h</i> 18' 14	<i>h</i> 11' 86	<i>h</i> 13' 34	<i>h</i> 13' 90	
			<i>h</i> 11' 86							<i>h</i> 16' 66	
			<i>h</i> 12' 16								
	12' 36	12' 42	12' 68	14' 28	14' 83	11' 94	18' 47	11' 85	14' 01	16' 13	

At XXII—(Continued.)											
<i>February 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 12'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	206° 49'	
XX & XXIII	"	"	"	"	"	"	"	"	"	"	M = 48'' 26 w = 1 '93 $\frac{1}{w}$ = 0 '52 C = 45° 42' 48'' 23
	d 50° 00	d 51° 26	h 42° 72	d 46° 06	h 47° 02	h 48° 28	h 47° 06	h 49° 58	h 51° 76	h 45° 12	
	d 52° 00	d 45° 72	h 45° 82	d 46° 66	h 47° 60	h 48° 80	h 48° 62	h 50° 08	h 51° 40	h 46° 78	
		d 48° 78	h 43° 80	h 48° 12							
	51° 00	48° 59	45° 12	46° 81	47° 31	48° 54	47° 84	49° 83	51° 58	45° 95	
XXIII & XXIV	d 6° 32	d 7° 21	h 10° 00	d 7° 87	h 6° 36	h 7° 74	h 10° 46	h 10° 82	h 0° 52	h 8° 88	M = 7'' 84 w = 1 '60 $\frac{1}{w}$ = 0 '63 C = 33° 14' 7'' 84
	d 5° 46	d 9° 79	h 12° 06	d 10° 17	h 7° 12	h 6° 90	h 7° 26	h 7° 50	h 4° 84	h 9° 44	
	5° 89	8° 50	11° 03	9° 02	6° 74	7° 32	8° 86	9° 16	2° 68	9° 16	
XXIV & XXV	d 13° 01	d 16° 62	h 12° 08	l 14° 62	h 17° 02	h 16° 74	h 16° 98	h 17° 12	d 19° 16	h 16° 58	M = 16'' 49 w = 2 '30 $\frac{1}{w}$ = 0 '43 C = 17° 4' 16'' 49
	d 14° 85	d 20° 66	h 14° 60	l 13° 54	h 15° 48	h 18° 50	h 18° 68	h 19° 64	d 17° 58	d 15° 36	
	13° 93	18° 64	13° 79	14° 08	16° 25	17° 62	17° 83	18° 38	18° 37	15° 97	
At XXIII											
<i>March 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	264° 3'	84° 4'	271° 16'	91° 16'	278° 28'	98° 28'	285° 40'	105° 40'	292° 52'	112° 52'	
XXVII & XXVI	"	"	"	"	"	"	"	"	"	"	M = 56'' 09 w = 1 '10 $\frac{1}{w}$ = 0 '91 C = 5° 0' 56'' 09
	h 60° 64	h 53° 56	h 55° 68	h 56° 26	h 58° 80	h 59° 52	h 60° 90	h 55° 30	d 52° 99	d 50° 88	
	h 57° 80	h 55° 74	h 55° 60	h 55° 96	h 57° 48	h 59° 08	h 59° 70	h 51° 80	d 54° 97	d 50° 44	
	d 58° 47				h 56° 68	h 59° 88			d 55° 69		
	58° 97	54° 65	55° 64	56° 11	56° 94	59° 49	60° 30	53° 55	54° 55	50° 66	

At XXIII—(Continued.)											
<i>March 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	264° 3'	84° 4'	271° 16'	91° 16'	278° 28'	98° 28'	285° 40'	105° 40'	292° 52'	112° 52'	
XXV & XXVI	"	"	"	"	"	"	"	"	"	"	M = 59''·11 w = 1·61 $\frac{1}{w}$ = 0·62 C = 32° 2'59''·10
	d 60'16	d 57'86	d 63'88	d 57'80	d 59'90	d 52'91	d 58'98	d 55'82	d 58'92	d 64'19	
	d 60'06	d 57'26	d 62'14	d 58'70	d 57'18	d 56'85	d 61'12	d 59'60	d 59'22	d 60'79	
	59'86	57'56	63'01	58'25	57'50	55'18	60'05	58'01	59'07	62'57	
XXV & XXIV	h 29'10	h 31'18	h 28'54	h 28'40	h 28'98	h 30'16	h 25'68	h 30'18	h 29'02	h 29'92	M = 28''·92 w = 3·62 $\frac{1}{w}$ = 0·28 C = 58° 52'28''·92
	h 28'10	h 32'14	h 26'94	h 28'68	h 31'02	h 31'82	h 26'60	h 27'30	h 28'66	h 28'38	
	d 27'85				d 27'13						
	28'35	31'66	27'74	28'54	29'04	30'99	26'14	28'74	28'84	29'15	
XXIV & XXII	h 27'50	h 26'62	h 26'58	h 29'34	h 26'44	h 28'82	h 24'18	h 25'30	h 24'86	h 24'12	M = 26''·76 w = 3·06 $\frac{1}{w}$ = 0·33 C = 28° 15'26''·73
	h 27'14	h 28'16	h 26'50	h 30'20	h 25'68	h 28'58	h 27'18	h 27'76	h 25'80	h 24'78	
			d 24'42							d 25'06	
	27'32	27'39	26'73	29'77	26'06	28'70	25'68	26'53	25'33	24'06	
XXII & XXI	h 35'06	h 38'34	h 32'80	h 36'62	h 41'08	h 36'94	h 41'04	h 41'72	h 41'38	h 43'14	M = 38''·23 w = 1·32 $\frac{1}{w}$ = 0·76 C = 37° 48'38''·22
	h 33'86	h 38'50	h 36'04	h 35'04	h 40'22	h 36'82	h 38'00	h 38'62	h 41'46	h 38'30	
			d 32'30							d 41'33	
	34'46	38'42	34'61	35'83	40'65	36'88	39'52	40'17	41'42	40'33	
At XXIV											
<i>March 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	63° 17'	243° 17'	70° 29'	260° 29'	77° 41'	257° 41'	84° 58'	264° 58'	92° 5'	272° 5'	
XXIII & XXV	"	"	"	"	"	"	"	"	"	"	M = 13''·21 w = 3·30 $\frac{1}{w}$ = 0·30 C = 87° 54'13''·21
	h 15'52	h 13'62	h 10'48	h 11'40	h 10'38	h 13'98	h 10'76	h 14'08	h 15'12	h 13'92	
	h 15'34	h 13'56	h 11'08	h 12'42	h 10'68	h 14'46	h 14'54	h 13'48	h 14'02	l 15'30	
	15'43	13'59	10'78	11'91	10'53	14'22	12'65	13'78	14'57	14'61	

At XXIV—(Continued.)											
<i>March 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	63° 17'	243° 17'	70° 29'	250° 29'	77° 41'	257° 41'	84° 53'	264° 53'	92° 5'	272° 5'	
XXV & XXII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 20''98 <i>w</i> = 5.34 $\frac{1}{w}$ = 0.19 <i>C</i> = 153° 35' 20''98
	h 19'48	h 21'12	h 21'56	h 20'86	h 21'54	h 22'46	h 22'72	h 21'68	h 20'40	l 20'16	
XXI & XX	h 17'96	h 22'20	d 18'73	h 21'30	h 22'38	h 22'80	h 18'34	h 23'06	h 20'32	d 19'95	<i>w</i> = 4.36 $\frac{1}{w}$ = 0.23 <i>C</i> = 19° 46' 48''38
	18'72	21'66	20'15	21'08	21'96	22'63	20'85	22'37	20'36	20'06	
XXI & XX	h 47'38	h 47'80	h 47'74	h 49'70	h 48'14	h 49'22	h 48'88	h 45'42	h 51'74	l 48'54	<i>M</i> = 38''97 <i>w</i> = 3.66 $\frac{1}{w}$ = 0.27 <i>C</i> = 35° 26' 38''99
	h 47'40	h 47'16	d 51'18	h 48'50	h 48'32	h 46'94	h 46'96	h 45'72	h 50'02	d 49'28	
XXI & XX	h 40'18	h 39'46	h 40'04	h 38'08	h 36'90	h 39'34	h 37'74	h 39'78	h 36'00	h 37'28	<i>M</i> = 24''94 <i>w</i> = 2.10 $\frac{1}{w}$ = 0.48 <i>C</i> = 9° 20' 24''94
	h 39'00	h 41'80	h 39'24	h 39'30	h 36'64	h 40'88	h 38'80	h 40'70	h 37'68	l 37'52	
XXI & XX	39'59	40'93	40'57	38'69	36'77	40'11	38'59	40'24	36'84	37'40	<i>M</i> = 22''10 <i>w</i> = 5.44 $\frac{1}{w}$ = 0.18 <i>C</i> = 33° 13' 22''09
	h 40'18	h 39'46	h 40'04	h 38'08	h 36'90	h 39'34	h 37'74	h 39'78	h 36'00	h 37'28	
XXI & XX	h 39'00	h 41'80	h 39'24	h 39'30	h 36'64	h 40'88	h 38'80	h 40'70	h 37'68	l 37'52	<i>M</i> = 22''10 <i>w</i> = 5.44 $\frac{1}{w}$ = 0.18 <i>C</i> = 33° 13' 22''09
	39'59	40'93	40'57	38'69	36'77	40'11	38'59	40'24	36'84	37'40	

At XXV											
<i>April 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	255° 44'	75° 44'	262° 56'	82° 56'	270° 8'	90° 8'	277° 20'	97° 20'	284° 31'	104° 32'	
XXII & XXIV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 24''94 <i>w</i> = 2.10 $\frac{1}{w}$ = 0.48 <i>C</i> = 9° 20' 24''94
	l 25'6c	h 24'74	h 24'16	h 23'46	h 23'80	h 26'46	h 24'36	h 25'18	l 28'86	l 29'22	
XXIII & XXIII	l 20'48	d 21'58	h 24'68	h 21'54	h 25'58	h 23'08	h 24'48	h 27'98	l 26'06	l 27'54	<i>M</i> = 22''10 <i>w</i> = 5.44 $\frac{1}{w}$ = 0.18 <i>C</i> = 33° 13' 22''09
	23'04	23'16	24'42	22'50	24'69	24'77	24'42	26'58	27'46	28'38	
XXIV & XXIII	l 20'42	h 21'12	h 23'26	h 24'02	h 24'00	h 21'24	h 21'84	h 22'54	l 20'26	l 19'80	<i>M</i> = 22''10 <i>w</i> = 5.44 $\frac{1}{w}$ = 0.18 <i>C</i> = 33° 13' 22''09
	l 22'84	d 21'55	d 21'34	h 24'16	h 21'68	h 25'10	h 22'00	h 21'42	l 21'12	l 22'70	
XXIV & XXIII	d 25'00		d 20'95					d 19'40			<i>M</i> = 22''10 <i>w</i> = 5.44 $\frac{1}{w}$ = 0.18 <i>C</i> = 33° 13' 22''09
	22'75	21'34	21'85	24'09	22'84	23'17	21'92	21'12	20'69	21'25	

At XXV—(Continued.)

April 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch  
Theodolite No. 2.

Angle between	Circle readings, telescope being set on XXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle		
	255° 44'	75° 44'	262° 56'	82° 56'	270° 8'	90° 8'	277° 20'	97° 20'	284° 31'	104° 32'			
XXIII & XXVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 47''·73 <i>w</i> = 3·54 $\frac{1}{w}$ = 0·27 <i>C</i> = 61° 42' 47''·78		
	l 45·98	h 47·82	h 49·30	h 48·74	h 45·36	h 47·48	h 45·00	h 51·20	l 47·04	l 46·68			
	l 48·70	l 51·02	h 51·08	h 47·70	h 47·46	h 46·10	h 45·66	h 48·92	l 48·94	l 45·70			
	l 47·70	l 48·66	d 48·84					d 47·48					
	d 50·83												
	48·30	49·17	49·74	48·22	46·41	46·79	45·33	49·20	47·99	46·19			
XXVI & XXVII	l 39·20	h 36·58	h 35·82	h 36·78	h 36·18	h 39·04	h 41·48	h 36·02	l 37·78	l 36·94	<i>M</i> = 37''·79 <i>w</i> = 3·62 $\frac{1}{w}$ = 0·28 <i>C</i> = 23° 0' 37''·80		
	l 37·28	h 36·82	h 37·50	h 40·20	h 37·56	h 38·72	h 40·74	h 35·20	l 37·36	l 37·68			
				h 39·82									
	38·24	36·70	36·66	38·93	36·87	38·88	41·11	35·61	37·57	37·31			
February 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.													
XXVII & XXVIII	Circle readings, telescope being set on XXVII.										<i>M</i> = 53''·77 <i>w</i> = 3·86 $\frac{1}{w}$ = 0·26 <i>C</i> = 20° 1' 53''·77		
	0° 8'	180° 3'	332° 7'	152° 7'	20° 4'	200° 4'	352° 8'	172° 8'	40° 5'	220° 5'		12° 10'	192° 10'
	"	"	"	"	"	"	"	"	"	"		"	"
	h 55·67	h 55·13	l 51·64	l 53·97	h 56·90	h 56·73	h 51·20	h 53·87	l 52·84	l 48·66		l 54·96	l 52·37
h 56·53	h 53·43	l 52·80	l 54·23	h 54·60	h 55·97	h 52·20	h 53·06	l 53·46	l 52·03	l 53·97	l 53·17		
				h 54·60					l 52·94				
	56·10	54·28	52·22	54·10	55·37	56·35	51·70	53·47	53·15	51·21	54·47	52·77	
XXVIII & XXIX	h 44·03	h 43·77	l 47·06	l 44·60	h 43·57	h 42·00	h 43·77	h 43·27	l 44·13	l 47·04	l 42·14	l 42·87	<i>M</i> = 43''·54 <i>w</i> = 9·32 $\frac{1}{w}$ = 0·11 <i>C</i> = 17° 53' 43''·55
	h 42·17	h 43·67	l 43·60	l 43·24	h 43·57	h 41·50	h 43·64	h 43·70	l 44·40	l 43·47	l 42·30	l 42·50	
					h 44·80					l 42·26			
	43·10	43·72	45·33	43·92	43·98	41·75	43·71	43·49	44·27	44·26	42·22	42·69	

At XXIV—(Continued.)											
<i>March 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	63° 17'	243° 17'	70° 29'	250° 29'	77° 41'	257° 41'	84° 53'	264° 53'	92° 5'	272° 5'	
XXV & XXII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 20''98 <i>w</i> = 5'34 $\frac{1}{w}$ = 0'19 <i>C</i> = 153° 35' 20''98
	h 19'48 h 17'96	h 21'12 h 22'20	h 21'56 d 18'73	h 20'86 h 21'30	h 21'54 h 22'38	h 22'46 h 22'80	h 22'72 h 18'34 d 21'49	h 21'68 h 23'06	h 20'40 h 20'32	l 20'16 d 19'95	
	18'72	21'66	20'15	21'08	21'96	22'63	20'85	22'37	20'36	20'06	
XXI & XXII	h 47'38 h 47'40	h 47'80 h 47'16 d 48'39	h 47'74 d 51'18 d 49'86	h 49'70 h 48'50	h 48'14 h 48'32	h 49'22 h 46'94	h 48'88 h 46'96 d 48'88	h 45'42 h 45'72	h 51'74 h 50'02	l 48'54 d 49'28	<i>M</i> = 48''38 <i>w</i> = 4'36 $\frac{1}{w}$ = 0'23 <i>C</i> = 19° 46' 48''38
	47'39	47'78	49'59	49'10	48'23	48'08	48'24	45'57	50'88	48'91	
XXI & XX	h 40'18 h 39'00	h 39'46 h 41'80 d 41'54	h 40'04 h 39'24 d 42'42	h 38'08 h 39'30	h 36'90 h 36'64	h 39'34 h 40'88	h 37'74 h 38'80 d 39'23	h 39'78 h 40'70	h 36'00 h 37'68	h 37'28 l 37'52	<i>M</i> = 38''97 <i>w</i> = 3'66 $\frac{1}{w}$ = 0'27 <i>C</i> = 35° 26' 38''99
	39'59	40'93	40'57	38'69	36'77	40'11	38'59	40'24	36'84	37'40	
At XXV											
<i>April 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on XXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	255° 44'	75° 44'	262° 56'	82° 56'	270° 8'	90° 8'	277° 20'	97° 20'	284° 31'	104° 32'	
XXIV & XXII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 24''94 <i>w</i> = 2'10 $\frac{1}{w}$ = 0'48 <i>C</i> = 9° 20' 24''94
	l 25'6c l 20'48	h 24'74 d 21'58	h 24'16 h 24'68	h 23'46 h 21'54	h 23'80 h 25'58	h 26'46 h 23'08	h 24'36 h 24'48	h 25'18 h 27'98	l 28'86 l 26'06	l 29'22 l 27'54	
	23'04	23'16	24'42	22'50	24'69	24'77	24'42	26'58	27'46	28'38	
XXIII & XXIV	l 20'42 l 22'84 d 25'00	h 21'12 d 21'55	h 23'26 d 21'34 d 20'95	h 24'02 h 24'16	h 24'00 h 21'68	h 21'24 h 25'10	h 21'84 h 22'00	h 22'54 h 21'42 d 19'40	l 20'26 l 21'12	l 19'80 l 22'70	<i>M</i> = 22''10 <i>w</i> = 5'44 $\frac{1}{w}$ = 0'18 <i>C</i> = 33° 13' 22''09
	22'75	21'34	21'85	24'09	22'84	23'17	21'92	21'12	20'69	21'25	



At XXV—(Continued.)

April 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch  
Theodolite No. 2.

Angle between	Circle readings, telescope being set on XXII										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	255° 44'	75° 44'	262° 56'	82° 56'	270° 8'	90° 8'	277° 20'	97° 20'	284° 31'	104° 32'		
XXVI & XXVIII	"	"	"	"	"	"	"	"	"	"	M = 47"·73 w = 3·54 $\frac{1}{w}$ = 0·27 C = 61° 42' 47"·78	
	l 45·98	h 47·82	h 49·30	h 48·74	h 45·36	h 47·48	h 45·00	h 51·20	l 47·04	l 46·68		
XXVI & XXVII	l 48·70	l 51·02	h 51·08	h 47·70	h 47·46	h 46·10	h 45·66	h 48·92	l 48·94	l 45·70	M = 37"·79 w = 3·62 $\frac{1}{w}$ = 0·28 C = 23° 0' 37"·80	
	l 47·70	l 48·66	d 48·84					d 47·48				
	48·30	49·17	49·74	48·22	46·41	46·79	45·33	49·20	47·99	46·19		
	l 39·20	h 36·58	h 35·82	h 36·78	h 36·18	h 39·04	h 41·48	h 36·02	l 37·78	l 36·94	M = 37"·79 w = 3·62 $\frac{1}{w}$ = 0·28 C = 23° 0' 37"·80	
	l 37·28	h 36·82	h 37·50	h 40·20	h 37·56	h 38·72	h 40·74	h 35·20	l 37·36	l 37·68		
	38·24	36·70	36·66	38·93	36·87	38·88	41·11	35·61	37·57	37·31		
February 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.												
XXVII & XXVIII	Circle readings, telescope being set on XXVII.										M = 53"·77 w = 3·86 $\frac{1}{w}$ = 0·26 C = 20° 1' 53"·77	
	0° 8'	180° 3'	332° 7'	152° 7'	20° 4'	200° 4'	352° 8'	172° 8'	40° 5'	220° 5'		12° 10'
XXVIII & XXIX	"	"	"	"	"	"	"	"	"	"	M = 43"·54 w = 9·32 $\frac{1}{w}$ = 0·11 C = 17° 53' 43"·55	
	h 55·67	h 55·13	l 51·64	l 53·97	h 56·90	h 56·73	h 51·20	h 53·87	l 52·84	l 48·66		l 54·96
	h 56·53	h 53·43	l 52·80	l 54·23	h 54·60	h 55·97	h 52·20	h 53·06	l 53·46	l 52·03	l 53·97	l 53·17
	56·10	54·28	52·22	54·10	55·37	56·35	51·70	53·47	53·15	51·21	54·47	52·77
	h 44·03	h 43·77	l 47·06	l 44·60	h 43·57	h 42·00	h 43·77	h 43·27	l 44·13	l 47·04	l 42·14	l 42·87
	h 42·17	h 43·67	l 43·60	l 43·24	h 43·57	h 41·50	h 43·64	h 43·70	l 44·40	l 43·47	l 42·30	l 42·50
	43·10	43·72	45·33	43·92	43·98	41·75	43·71	43·49	44·27	44·26	42·22	42·69

At XXVI													
April 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.													
Angle between	Circle readings, telescope being set on XXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle		
	0° 0'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'			
XXVII & R M	l 10'16	l 11'04	l 10'06	h 12'98	l 12'44	l 12'12	h 14'58	h 13'26	l 14'76	l 10'46	$\frac{l}{w} = 0'27$ $C = 40^{\circ} 30' 11'' \cdot 59$		
	l 10'56	l 13'74	l 10'06	h 10'60	l 10'98	l 7'28	h 11'86	h 10'56	l 11'64	l 8'98			
		l 15'26		h 11'10		l 11'84		h 12'92	l 11'88				
						l 14'66							
						d 9'43							
						d 8'81							
	10'36	13'35	10'06	11'56	11'71	10'69	13'22	12'25	12'76	9'72	$w = 1'25$ $\frac{l}{w} = 0'80$ $C = 113^{\circ} 33' 36'' \cdot 87$		
R M & XXV	d 25'28	d 22'01	l 27'44	h 26'24	d 27'69	l 27'72	d 21'58	d 25'55	d 23'72	d 28'38	$\frac{l}{w} = 0'53$ $C = 73^{\circ} 3' 25'' \cdot 28$		
	d 25'84	d 22'21	d 26'56	h 26'90	d 27'09	l 28'34	d 21'62	d 22'91	d 21'97	d 26'92			
						d 25'98	d 22'58	d 26'17					
						d 25'36							
	25'56	22'11	27'00	26'57	27'39	26'85	21'93	24'88	22'85	27'65			
XXV & XXIII	h 14'20	h 16'12	h 14'98	h 16'12	h 11'74	l 15'94	d 17'51	d 18'30	h 17'24	h 12'42	$M = 15'' \cdot 62$ $w = 1'80$ $\frac{l}{w} = 0'56$ $C = 86^{\circ} 14' 15'' \cdot 62$		
	h 13'94	h 17'66	d 15'94	h 15'12	h 12'66	h 18'62	d 21'41	d 17'60	d 15'49	h 11'98			
						h 16'46		d 14'74					
	14'07	16'89	15'46	15'62	12'20	17'01	19'46	16'88	16'37	12'20			
At XXVII													
January 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.													
Angle between	Circle readings, telescope being set on XXVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle		
	0° 1'	180° 1'	10° 2'	190° 2'	20° 4'	200° 4'	30° 5'	210° 5'	40° 6'	220° 7'		50° 6'	230° 6'
XXVIII & XXIX	l 16'94	l 19'63	l 18'73	h 17'10	h 15'97	h 19'14	l 19'03	l 16'20	l 17'57	l 17'96	l 20'23	l 16'80	$M = 17'' \cdot 65$ $w = 11'52$ $\frac{l}{w} = 0'08$ $C = 81^{\circ} 43' 17'' \cdot 69$
	l 18'97	l 16'43	l 20'50	h 17'36	h 16'40	h 15'80	l 16'93	l 16'70	l 17'73	l 17'80	l 17'20	l 18'00	
	l 18'70	l 17'30	h 18'44			h 17'96	l 18'50			l 16'60			
	18'20	17'79	19'22	17'23	16'19	17'63	18'15	16'45	17'65	17'88	18'01	17'40	

At XXVII—(Continued.)													
January 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.													
Angle between	Circle readings, telescope being set on XXVIII												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	10° 2'	190° 2'	20° 4'	200° 4'	30° 5'	210° 5'	40° 8'	220° 7'	50° 8'	280° 6'	
XXIX & XXV	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 23"·05 <i>w</i> = 6·00 $\frac{1}{w}$ = 0·17 <i>C</i> = 59° 34' 23"·04
	l 23° 93'	l 24° 94'	l 22° 44'	l 24° 93'	l 23° 47'	l 25° 17'	h 21° 70'	h 23° 33'	h 24° 00'	h 23° 57'	h 21° 47'	h 23° 17'	
	l 24° 43'	l 25° 33'	l 20° 60'	l 24° 20'	l 21° 76'	l 23° 60'	h 20° 73'	h 21° 97'	h 20° 07'	h 23° 30'	h 20° 57'	h 23° 70'	
	l 21° 70'		l 22° 40'	l 24° 13'	h 22° 13'	h 23° 14'	h 22° 10'						
	24° 18'	25° 14'	21° 58'	24° 57'	22° 54'	24° 30'	21° 52'	22° 81'	22° 06'	23° 44'	21° 02'	23° 44'	
April 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.													
Angle between	Circle readings, telescope being set on XXV												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	816° 35'	186° 35'	323° 47'	148° 47'	330° 58'	150° 59'	338° 10'	156° 11'	345° 23'	165° 23'			
XXV & XXVI	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 45"·75 <i>w</i> = 2·94 $\frac{1}{w}$ = 0·34 <i>C</i> = 43° 25' 44"·77
	h 47° 04'	h 45° 48'	h 46° 06'	h 42° 82'	h 41° 62'	h 43° 36'	h 44° 44'	h 46° 16'	h 45° 30'	h 45° 22'			
	h 46° 44'	h 46° 62'	h 43° 70'	h 43° 02'	h 43° 40'	h 43° 62'	h 42° 58'	h 44° 70'	h 45° 38'	h 50° 36'	h 42° 68'	h 47° 08'	
	46° 74'	46° 05'	44° 88'	42° 92'	42° 51'	43° 49'	43° 51'	45° 43'	44° 45'	47° 55'			
XXVI & XXIII	h 53° 68'	h 56° 98'	h 58° 50'	h 58° 56'	h 56° 82'	h 57° 30'	h 56° 82'	h 54° 88'	h 50° 34'	h 58° 90'			<i>M</i> = 56"·26 <i>w</i> = 3·15 $\frac{1}{w}$ = 0·32 <i>C</i> = 14° 46' 56"·24
	h 54° 64'	h 57° 76'	h 54° 50'	h 54° 72'	h 53° 52'	h 56° 42'	h 59° 48'	h 57° 44'	h 53° 48'	h 54° 00'	h 57° 30'	h 57° 00'	
			h 56° 54'	h 59° 02'	h 56° 36'								
	54° 16'	57° 37'	56° 51'	57° 43'	55° 57'	56° 86'	58° 15'	56° 16'	53° 71'	56° 63'			
At XXVIII													
March 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.													
Angle between	Circle readings, telescope being set on XXX												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	285° 47'	105° 47'	20° 8'	200° 8'	305° 48'	125° 48'	40° 5'	220° 5'	325° 51'	145° 51'	
XXX & XXXI	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 14"·09 <i>w</i> = 9·62 $\frac{1}{w}$ = 0·10 <i>C</i> = 84° 16' 14"·08
	h 15° 77'	h 12° 83'	h 15° 60'	h 13° 47'	h 12° 36'	l 12° 10'	h 14° 63'	h 13° 34'	h 14° 53'	h 14° 66'	l 14° 10'	l 16° 27'	
	h 12° 37'	l 12° 13'	h 13° 67'	h 12° 60'	l 13° 77'	l 14° 40'	h 15° 47'	h 15° 00'	h 13° 90'	h 15° 97'	l 13° 63'	l 15° 16'	
	h 13° 67'			l 14° 04'									
	13° 94'	12° 48'	14° 64'	13° 04'	13° 39'	13° 25'	15° 05'	14° 17'	14° 22'	15° 32'	13° 87'	15° 72'	



At XXVII—(Continued.)													
<i>January 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.</i>													
Angle between	Circle readings, telescope being set on XXVIII												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	10° 2'	190° 2'	20° 4'	200° 4'	30° 5'	210° 5'	40° 6'	220° 7'	50° 8'	260° 6'	
XXIX & XXV	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 23° 05 <i>w</i> = 6 00 $\frac{1}{w}$ = 0 17 <i>C</i> = 59° 34' 23" 04
	l 23° 03	l 24° 04	l 22° 44	l 24° 03	l 23° 47	l 25° 17	h 21° 70	h 23° 33	h 24° 00	h 23° 57	h 21° 47	h 23° 17	
	l 24° 43	l 25° 33	l 20° 60	l 24° 20	l 21° 76	l 23° 60	h 20° 73	h 21° 97	h 20° 07	h 23° 30	h 20° 57	h 23° 70	
		l 21° 70		l 22° 40	l 24° 13	h 22° 13	h 23° 14	h 22° 10					
	24° 18	25° 14	21° 58	24° 57	22° 54	24° 30	21° 52	22° 81	22° 06	23° 44	21° 02	23° 44	
<i>April 1850, observed by Captain J. S. Du Vernet with Lieut.-Colonel Waugh's 24-inch Theodolite No. 2.</i>													
Angle between	Circle readings, telescope being set on XXV												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	316° 35'	186° 35'	328° 47'	148° 47'	330° 58'	150° 59'	338° 10'	155° 11'	345° 23'	165° 28'			
XXV & XXVI	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 45° 75 <i>w</i> = 2 94 $\frac{1}{w}$ = 0 34 <i>C</i> = 43° 25' 44" 77
	h 47° 04	h 45° 48	h 46° 06	h 42° 82	h 41° 62	h 43° 36	h 44° 44	h 46° 16	h 45° 30	h 45° 22			
	h 46° 44	h 46° 62	h 43° 70	h 43° 02	h 43° 40	h 43° 62	h 42° 58	h 44° 70	h 45° 38	h 50° 36	h 42° 68	h 47° 08	
	46° 74	46° 05	44° 88	42° 92	42° 51	43° 49	43° 51	45° 43	44° 45	47° 55			
XXVI & XXIII	h 53° 68	h 56° 98	h 58° 50	h 58° 56	h 56° 82	h 57° 30	h 56° 82	h 54° 88	h 50° 34	h 58° 90			<i>M</i> = 56° 26 <i>w</i> = 3 15 $\frac{1}{w}$ = 0 32 <i>C</i> = 14° 46' 56" 24
	h 54° 64	h 57° 76	h 54° 50	h 54° 72	h 53° 52	h 56° 42	h 59° 48	h 57° 44	h 53° 48	h 54° 00			
			h 56° 54	h 59° 02	h 56° 36				h 57° 30	h 57° 00			
	54° 16	57° 37	56° 51	57° 43	55° 57	56° 86	58° 15	56° 16	53° 71	56° 63			
At XXVIII													
<i>March 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.</i>													
Angle between	Circle readings, telescope being set on XXX												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	285° 47'	105° 47'	20° 8'	200° 8'	305° 48'	125° 48'	40° 5'	220° 5'	325° 51'	145° 51'	
XXX & XXXI	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 14° 09 <i>w</i> = 9 62 $\frac{1}{w}$ = 0 10 <i>C</i> = 84° 16' 14" 08
	h 15° 77	h 12° 83	h 15° 60	h 13° 47	h 12° 36	l 12° 10	h 14° 63	h 13° 34	h 14° 53	h 14° 66	l 14° 10	l 16° 27	
	h 12° 37	l 12° 13	h 13° 67	h 12° 60	l 13° 77	l 14° 40	h 15° 47	h 15° 00	h 13° 90	h 15° 97	l 13° 63	l 15° 16	
	h 13° 67			l 14° 04									
	13° 94	12° 48	14° 64	13° 04	13° 39	13° 25	15° 05	14° 17	14° 22	15° 32	13° 87	15° 72	

At XXVIII—(Continued.)													
<i>March 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.</i>													
Angle between	Circle readings, telescope being set on XXX											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	0° 1'	180° 1'	285° 47'	105° 47'	20° 3'	200° 3'	305° 49'	125° 49'	40° 5'	220° 5'	325° 51'		145° 51'
XXI & XXIX	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 27''·75 <i>w</i> = 2·90 $\frac{1}{w}$ = 0·34 <i>C</i> = 33° 29' 27''·75
	h23°16	h26°87	h26°50	h26°50	h30°77	l33°33	h29°87	h27°06	h26°30	h28°50	l28°47	l23°93	
	h27°60	l28°10	h27°26	h28°23	l28°57	l30°17	h27°13	h26°50	h27°50	h29°13	l27°50	l26°20	
	h24°97				l31°26								
	25°24	27°49	26°88	27°37	30°20	31°75	28°50	26°78	26°90	28°82	27°99	25°07	
XXIX & XXV	h39°14	h37°26	h35°80	h35°13	l33°76	l34°67	h35°76	h37°90	h36°04	h35°57	l35°50	l38°57	<i>M</i> = 36''·13 <i>w</i> = 5·53 $\frac{1}{w}$ = 0·18 <i>C</i> = 13° 21' 36''·13
	h35°63	l37°03	h36°30	h36°27	l32°77	l35°33	h36°03	h38°04	h35°33	h35°07	l35°84	l38°30	
	h37°50												
	37°42	37°15	36°05	35°70	33°27	35°00	35°90	37°97	35°69	35°32	35°67	38°44	
XXVII & XXV	h28°30	h28°87	h29°97	h28°44	l28°20	l32°73	h29°10	h27°97	h30°26	h28°70	l28°83	l29°63	<i>M</i> = 29''·22 <i>w</i> = 10·07 $\frac{1}{w}$ = 0·10 <i>C</i> = 18° 40' 29''·22
	h30°64	l26°97	h30°10	h28°90	l29°07	l28°60	h29°87	h28°93	h30°37	h29°06	l31°10	l26°97	
	h29°00												
	29°31	27°92	30°04	28°67	28°64	30°67	29°49	28°45	30°32	28°88	29°97	28°30	
At XXIX													
<i>February 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.</i>													
Angle between	Circle readings, telescope being set on XXV											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	0° 2'	180° 2'	287° 33'	107° 33'	20° 3'	200° 3'	307° 34'	127° 34'	40° 6'	220° 6'	327° 36'		147° 36'
XXVII & XXV	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 2''·52 <i>w</i> = 12·58 $\frac{1}{w}$ = 0·08 <i>C</i> = 82° 30' 2''·53
	l1°24	l3°16	l2°26	l3°70	l4°60	l2°90	l4°33	l3°17	l1°03	l1°73	l0°46	l1°53	
	l2°40	l2°56	l2°27	l1°60	l3°10	l2°50	l2°77	l4°40	l3°66	l1°67	l1°30	l2°76	
				l2°90									
	1°82	2°86	2°27	2°65	3°53	2°70	3°55	3°79	2°35	1°70	0°88	2°15	
XXVI & XXVIII	l38°43	l40°00	l40°37	l36°43	l35°77	l40°83	l40°30	l36°37	l38°97	l39°53	l39°20	l39°40	<i>M</i> = 38''·73 <i>w</i> = 6·00 $\frac{1}{w}$ = 0·17 <i>C</i> = 66° 14' 38''·73
	l39°90	l39°40	l39°67	l38°33	h36°17	l40°23	l38°96	l37°63	l37°20	l39°13	l38°83	l38°37	
	39°17	39°70	40°02	37°38	35°97	40°53	39°63	37°00	38°09	39°33	39°02	38°89	

At XXIX—(Continued.)		
<i>February 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.</i>		
Angle between	Circle readings, telescope being set on XXV	M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2' 180° 2' 287° 33' 107° 33' 20° 3' 200° 3' 307° 34' 127° 34' 40° 6' 220° 6' 327° 36' 147° 36'	
XXVIII & XXX	" " " " " " " " " " " " l 13° 20' l 12° 34' l 11° 36' l 12° 77' l 14° 20' h 13° 27' l 10° 87' l 14° 16' l 11° 60' l 11° 04' h 13° 47' h 13° 36' l 12° 10' l 12° 34' l 12° 33' l 13° 07' h 13° 06' l 8° 97' l 14° 00' l 13° 27' l 13° 20' l 12° 00' h 14° 84' h 11° 90' l 12° 50' l 12° 97'	M = 12'' 68 w = 11 20 $\frac{1}{w} = 0 \cdot 09$ C = 25° 20' 12'' 66
XXX & XXXI	l 56° 03' l 56° 90' l 59° 27' l 59° 16' l 55° 13' h 58° 70' l 57° 77' l 56° 34' l 57° 46' l 59° 63' h 55° 93' h 56° 14' l 57° 53' l 57° 80' l 56° 60' l 58° 70' h 58° 27' l 59° 40' l 57° 44' l 56° 57' l 59° 30' l 59° 87' h 56° 73' h 56° 76' l 59° 50' l 57° 20'	M = 57'' 64 w = 7 52 $\frac{1}{w} = 0 \cdot 13$ C = 34° 2' 57'' 65
At XXX		
<i>March 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.</i>		
Angle between	Circle readings, telescope being set on XXXV	M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1' 180° 1' 315° 8' 135° 8' 20° 4' 200° 4' 335° 8' 155° 8' 40° 7' 220° 7' 355° 11' 175° 11'	
XXXIV & XXXIV	" " " " " " " " " " " " h 44° 96' h 46° 37' h 45° 67' h 46° 53' h 45° 74' h 44° 83' h 47° 50' h 46° 33' h 44° 40' h 42° 23' h 45° 24' h 46° 46' h 47° 54' h 46° 44' h 45° 30' h 47° 50' h 45° 34' h 42° 36' h 47° 20' h 44° 44' h 44° 30' h 44° 27' h 44° 26' h 47° 26' h 46° 87' h 47° 03' h 43° 86'	M = 45'' 60 w = 6 06 $\frac{1}{w} = 0 \cdot 17$ C = 54° 54' 45'' 60
XXXIV & XXXII	h 17° 34' h 14° 60' h 14° 80' h 14° 50' l 16° 40' l 14° 20' l 14° 07' l 15° 33' h 14° 67' h 14° 07' h 16° 30' h 16° 20' h 14° 06' h 12° 76' h 15° 00' h 13° 57' l 16° 27' l 13° 26' l 15° 53' l 14° 17' h 14° 00' h 12° 10' h 14° 40' h 14° 67' h 12° 93' h 12° 37' h 15° 10'	M = 14'' 61 w = 10 32 $\frac{1}{w} = 0 \cdot 10$ C = 36° 28' 14'' 59





At XXXI—(Continued.)

March 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.

Angle between	Circle readings, telescope being set on XXIX												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	282° 55'	102° 55'	20° 4'	200° 4'	302° 58'	122° 58'	40° 5'	220° 5'	322° 59'	142° 59'	
XXVIII & XXX	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 32''·46 <i>w</i> = 7·80 $\frac{1}{w}$ = 0·13 <i>C</i> = 41° 53' 32''·46
	h32°00	h31°97	h31°24	l35°74	l33°66	l31°40	h34°67	h33°84	l30°70	l34°87	l30°67	l30°83	
	h31°54	h33°10	h32°00	l32°53	l31°30	l32°66	h30°10	h33°07	l32°37	l34°63	l32°50	l31°53	
	h34°03	h31°10	l31°13	l32°44	l33°63	h32°86							
	31°77	33°03	31°45	33°13	32°47	32°56	32°54	33°46	31°54	34°75	31°59	31°18	
XXX & XXXI	l47°86	l49°10	l45°50	l45°63	l46°57	l47°04	h46°70	h44°63	l49°70	l47°20	l48°23	l47°70	<i>M</i> = 47''·27 <i>w</i> = 8·32 $\frac{1}{w}$ = 0·12 <i>C</i> = 25° 31' 47''·28
	l49°17	l47°60	l49°53	l47°26	l46°93	l45°64	h46°76	h45°70	l47°23	l48°57	l48°27	l46°30	
			l48°73						l46°70				
	48°52	48°35	47°92	46°45	46°75	46°34	46°73	45°17	47°88	47°89	48°25	47°00	
XXXII & XXXIII	d53°88	d57°25	d58°18	d56°25	d57°69	d58°43	h59°17	h58°83	l58°43	l53°80	l58°74	l57°63	<i>M</i> = 57''·19 <i>w</i> = 3·54 $\frac{1}{w}$ = 0·28 <i>C</i> = 25° 56' 57''·19
	d54°64	d55°48	d55°78	d56°08	d58°98	d58°36	h59°14	h57°93	l58°00	l53°77	l57°83	l59°37	
		d55°22	d56°62	d56°09	d59°08	d56°80		l58°97					
	54°26	55°98	56°86	56°14	58°58	57°86	59°16	58°38	58°47	53°79	58°29	58°50	

At XXXII

April 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.

Angle between	Circle readings, telescope being set on XXXIII												<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	320° 23'	140° 23'	20° 4'	200° 4'	340° 24'	160° 24'	40° 5'	220° 5'	0° 27'	180° 27'	
XXXIII & XXXI	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 61''·96 <i>w</i> = 5·29 $\frac{1}{w}$ = 0·19 <i>C</i> = 21° 59' 61''·96
	d63°31	d64°43	d62°65	d61°85	d63°48	d61°13	l56°94	l59°86	l58°46	l60°40	l61°30	l60°57	
	d63°28	d63°60	d64°68	d52°32	d61°75	d62°56	l61°96	l61°53	l62°20	l60°90	l62°36	l61°13	
		d64°05		d62°61		l64°66	d60°54				l61°90		
	63°30	64°02	63°79	62°09	62°61	61°85	61°19	60°64	60°33	60°65	61°83	61°20	



At XXXIII—(Continued.)													
April 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.													
Angle between	Circle readings, telescope being set on XXXI											M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 1'	180° 1'	297° 34'	117° 34'	20° 4'	200° 4'	317° 36'	137° 36'	40° 7'	220° 7'	337° 39'		157° 39'
XXX & XXXII	"	"	"	"	"	"	"	"	"	"	"	"	M = 39" 76 w = 10 03 $\frac{1}{w}$ = 0 10 C = 59° 34' 39" 77
	h 37° 93	h 42° 80	h 40° 96	h 39° 67	h 41° 13	l 39° 13	l 38° 87	l 38° 47	l 37° 73	l 39° 00	l 39° 44	l 41° 23	
	h 39° 34	h 40° 90	h 40° 87	h 39° 80	h 40° 70	l 38° 30	l 39° 53	l 38° 80	l 40° 87	l 39° 30	l 40° 97	l 39° 60	
	h 40° 23												
	38° 64	41° 31	40° 92	39° 74	40° 92	38° 72	39° 20	38° 64	39° 30	39° 15	40° 21	40° 42	
At XXXIV													
April 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.													
Angle between	Circle readings, telescope being set on XXXVII											M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 1'	180° 1'	318° 40'	138° 40'	20° 2'	200° 2'	338° 43'	158° 43'	40° 5'	220° 5'	358° 45'		178° 45'
XXXVII & XXXII	"	"	"	"	"	"	"	"	"	"	"	"	M = 5" 13 w = 11 07 $\frac{1}{w}$ = 0 09 C = 51° 23' 5" 13
	h 4° 64	h 4° 33	h 6° 43	h 5° 67	h 3° 47	h 5° 56	l 5° 17	l 5° 60	l 3° 24	l 6° 13	l 4° 77	l 4° 83	
	h 6° 64	h 3° 10	h 6° 67	h 4° 43	h 3° 83	h 5° 70	l 5° 57	l 5° 70	l 3° 20	l 4° 80	l 6° 70	l 5° 70	
	h 6° 13	h 5° 50		h 4° 60									
	5° 80	4° 31	6° 55	4° 90	3° 65	5° 63	5° 37	5° 65	3° 22	5° 47	5° 74	5° 27	
XXXII & XXX	h 12° 43	h 13° 07	h 9° 80	h 11° 57	h 13° 23	h 14° 24	l 12° 80	l 12° 04	l 10° 90	l 11° 80	l 11° 43	l 11° 14	M = 12" 31 w = 9 30 $\frac{1}{w}$ = 0 11 C = 84° 43' 12" 28
	h 12° 10	h 13° 67	h 12° 60	h 9° 50	h 12° 70	h 14° 37	l 12° 77	l 13° 10	l 13° 10	l 12° 77	l 11° 24	l 11° 74	
			h 12° 53	h 10° 53					l 12° 30		h 13° 24	h 9° 90	
	12° 27	13° 37	11° 64	10° 53	12° 97	14° 31	12° 79	12° 57	12° 10	12° 29	11° 97	10° 93	
XXX & XXXV	h 8° 43	h 5° 46	h 9° 70	h 9° 20	h 7° 50	h 7° 86	h 8° 67	h 9° 76	h 9° 37	h 7° 50	h 8° 80	h 5° 06	M = 8" 35 w = 7 98 $\frac{1}{w}$ = 0 13 C = 71° 6' 8" 36
	h 9° 46	h 6° 87	h 8° 07	h 10° 20	h 8° 50	h 6° 33	h 10° 00	h 7° 44	h 8° 47	h 8° 07	h 9° 96	h 9° 10	
			h 8° 23	h 10° 20								h 8° 17	
	8° 95	6° 17	8° 67	9° 87	8° 00	7° 10	9° 34	8° 60	8° 92	7° 79	9° 38	7° 44	

At XXXII—(Continued.)													
<i>April 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.</i>													
Angle between	Circle readings, telescope being set on XXXIII											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	0° 2'	180° 2'	320° 23'	140° 23'	20° 4'	200° 4'	340° 24'	160° 24'	40° 5'	220° 5'	0° 27'		180° 27'
XXXI & XXX	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 12''·91 <i>w</i> = 10·62 $\frac{1}{w}$ = 0·09 <i>C</i> = 27° 40' 12''·92
	h11'24	h12'27	h11'33	h12'33	l12'54	l12'54	l15'53	l13'94	l13'80	l12'83	l14'13	l11'86	
XXX & XXXIV	h12'60	h11'93	h11'57	h13'37	l14'04	l11'40	l13'07	l15'10	l12'80	l12'44	l14'14	l14'57	<i>M</i> = 34''·41 <i>w</i> = 7·24 $\frac{1}{w}$ = 0·14 <i>C</i> = 58° 48' 34''·42
	l13'10	l14'36										l12'20	
XXXIV & XXXVII	11'92	12'10	11'45	12'85	13'29	11'97	13'90	14'47	13'30	12'64	14'14	12'88	<i>M</i> = 42''·28 <i>w</i> = 7·76 $\frac{1}{w}$ = 0·13 <i>C</i> = 72° 32' 42''·26
	h33'87	h33'33	h33'83	h33'80	h30'33	h35'34	l36'27	l32'43	l33'74	l35'30	l35'63	l35'20	
XXXIV & XXXVII	h35'17	h33'57	h36'73	h33'50	h36'56	h34'40	l34'90	l32'07	l35'24	l35'76	l34'76	l32'47	<i>M</i> = 25''·00 <i>w</i> = 8·40 $\frac{1}{w}$ = 0·12 <i>C</i> = 72° 28' 25''·02
	h36'74		h34'07		l35'64						l34'24		
XXXIV & XXXVII	34'52	33'45	35'77	33'65	33'65	34'87	35'60	32'25	34'49	35'53	35'20	33'97	<i>M</i> = 42''·28 <i>w</i> = 7·76 $\frac{1}{w}$ = 0·13 <i>C</i> = 72° 32' 42''·26
	h42'46	h42'94	h42'10	h44'90	h46'17	h42'00	l42'86	l43'20	l42'13	l42'07	l39'90	l43'24	
XXXIV & XXXVII	h42'53	h41'33	h40'00	h42'63	h39'80	h44'17	l40'47	l43'97	l42'23	l43'04	l41'20	l42'60	<i>M</i> = 25''·00 <i>w</i> = 8·40 $\frac{1}{w}$ = 0·12 <i>C</i> = 72° 28' 25''·02
	h40'53	h41'64	h42'17		l40'13								
XXXIV & XXXVII	42'50	42'14	40'88	43'06	42'71	43'09	41'15	43'59	42'18	42'56	40'55	42'92	<i>M</i> = 25''·00 <i>w</i> = 8·40 $\frac{1}{w}$ = 0·12 <i>C</i> = 72° 28' 25''·02
	h27'44	h23'27	h26'04	h25'26	l23'70	l26'10	l27'13	l24'27	l25'00	l24'93	l24'40	l24'50	
XXXI & XXX	h25'13	h26'37	h27'03	h26'40	l24'90	l25'90	l23'83	l24'30	l22'06	l22'40	l24'83	l24'37	<i>M</i> = 25''·00 <i>w</i> = 8·40 $\frac{1}{w}$ = 0·12 <i>C</i> = 72° 28' 25''·02
	h26'07	h25'40			l25'80								
XXXI & XXX	26'21	25'01	26'54	25'83	24'30	26'00	25'59	24'29	23'53	23'67	24'62	24'44	<i>M</i> = 25''·00 <i>w</i> = 8·40 $\frac{1}{w}$ = 0·12 <i>C</i> = 72° 28' 25''·02
	h27'44	h23'27	h26'04	h25'26	l23'70	l26'10	l27'13	l24'27	l25'00	l24'93	l24'40	l24'50	

At XXXIII—(Continued.)													
April 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.													
Angle between	Circle readings, telescope being set on XXXI											M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 1'	180° 1'	297° 34'	117° 34'	20° 4'	200° 4'	317° 36'	137° 36'	40° 7'	220° 7'	337° 39'		157° 39'
XXX & XXXII	"	"	"	"	"	"	"	"	"	"	"	"	M = 39''·76 w = 10·03 $\frac{1}{w}$ = 0·10 C = 59° 34' 39''·77
	h 37° 93'	h 42° 80'	h 40° 96'	h 39° 67'	h 41° 13'	l 39° 13'	l 38° 87'	l 38° 47'	l 37° 73'	l 39° 00'	l 39° 44'	l 41° 23'	
	h 39° 34'	h 40° 90'	h 40° 87'	h 39° 80'	h 40° 70'	l 38° 30'	l 39° 53'	l 38° 80'	l 40° 87'	l 39° 30'	l 40° 97'	l 39° 60'	
	h 40° 23'												
	38° 64'	41° 31'	40° 92'	39° 74'	40° 92'	38° 72'	39° 20'	38° 64'	39° 30'	39° 15'	40° 21'	40° 42'	
At XXXIV													
April 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Theodolite.													
Angle between	Circle readings, telescope being set on XXXVII											M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 1'	180° 1'	318° 40'	138° 40'	20° 2'	200° 2'	338° 43'	158° 43'	40° 5'	220° 5'	358° 45'		178° 45'
XXXVII & XXXII	"	"	"	"	"	"	"	"	"	"	"	"	M = 5''·13 w = 11·07 $\frac{1}{w}$ = 0·09 C = 51° 23' 5''·13
	h 4° 64'	h 4° 33'	h 6° 43'	h 5° 67'	h 3° 47'	h 5° 56'	l 5° 17'	l 5° 60'	l 3° 24'	l 6° 13'	l 4° 77'	l 4° 83'	
	h 6° 64'	h 3° 10'	h 6° 67'	h 4° 43'	h 3° 83'	h 5° 70'	l 5° 57'	l 5° 70'	l 3° 20'	l 4° 80'	l 6° 70'	l 5° 70'	
	h 6° 13'	h 5° 50'		h 4° 60'									
	5° 80'	4° 31'	6° 55'	4° 90'	3° 65'	5° 63'	5° 37'	5° 65'	3° 22'	5° 47'	5° 74'	5° 27'	
XXXII & XXX	h 12° 43'	h 13° 07'	h 9° 80'	h 11° 57'	h 13° 23'	h 14° 24'	l 12° 80'	l 12° 04'	l 10° 90'	l 11° 80'	l 11° 43'	l 11° 14'	M = 12''·31 w = 9·30 $\frac{1}{w}$ = 0·11 C = 84° 43' 12''·28
	h 12° 10'	h 13° 67'	h 12° 60'	h 9° 50'	h 12° 70'	h 14° 37'	l 12° 77'	l 13° 10'	l 13° 10'	l 12° 77'	l 11° 24'	l 11° 74'	
			h 12° 53'	h 10° 53'					l 12° 30'		h 13° 24'	h 9° 90'	
	12° 27'	13° 37'	11° 64'	10° 53'	12° 97'	14° 31'	12° 79'	12° 57'	12° 10'	12° 29'	11° 97'	10° 93'	
XXX & XXXIV	h 8° 43'	h 5° 46'	h 9° 70'	h 9° 20'	h 7° 50'	h 7° 86'	h 8° 67'	h 9° 76'	h 9° 37'	h 7° 50'	h 8° 80'	h 5° 06'	M = 8''·35 w = 7·98 $\frac{1}{w}$ = 0·13 C = 71° 6' 8''·36
	h 9° 46'	h 6° 87'	h 8° 07'	h 10° 20'	h 8° 50'	h 6° 33'	h 10° 00'	h 7° 44'	h 8° 47'	h 8° 07'	h 9° 96'	h 9° 10'	
			h 8° 23'	h 10° 20'								h 8° 17'	
	8° 95'	6° 17'	8° 67'	9° 87'	8° 00'	7° 10'	9° 34'	8° 60'	8° 92'	7° 79'	9° 38'	7° 44'	



At XXXVI											
November 1851, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XXXIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	206° 58'	26° 58'	214° 11'	34° 11'	221° 27'	41° 27'	228° 35'	48° 35'	235° 46'	55° 46'	
XXXVIII & XXXIX & XXXVII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 58''·25 <i>w</i> = 5·78 $\frac{1}{w}$ = 0·17 <i>C</i> = 67° 51' 58''·28
	h 61·50 h 57·02 d 59·42	h 58·36 h 59·30	l 58·12 l 58·14	l 59·26 l 56·64	h 55·54 h 56·76	h 56·70 h 60·20 d 58·50	h 57·80 h 60·92	h 58·32 h 58·78 h 57·58	h 57·58 h 55·82	l 58·78 l 59·44 l 59·84	
	59·31	58·83	58·13	57·95	56·15	58·47	59·36	58·23	56·70	59·35	
XXXVIII & XXXVII	h 43·10 h 43·54 d 43·48	h 44·20 h 43·70	l 45·84 l 45·48	l 44·76 l 46·92	h 46·68 h 44·36	h 45·96 h 45·64 d 45·85	h 45·10 h 44·72	h 46·64 h 45·76 d 45·17	h 46·26 h 49·18 d 45·24	l 45·54 l 44·26 l 45·72	<i>M</i> = 45''·30 <i>w</i> = 7·65 $\frac{1}{w}$ = 0·13 <i>C</i> = 68° 4' 45''·31
		43·37	43·95	45·66	45·84	45·52	45·82	44·91	45·86	46·89	
XXXVII & R M	h 51·68 h 52·24 d 52·12	h 51·48 h 50·70	l 49·88 l 50·32	l 49·32 l 48·92	h 50·18 h 51·10	h 47·48 h 47·16 d 47·37	h 51·00 h 49·20	h 48·72 h 47·14 d 46·90	h 49·46 h 49·10 d 46·80	l 48·54 l 50·70 l 48·64	<i>M</i> = 49''·57 <i>w</i> = 4·05 $\frac{1}{w}$ = 0·25 <i>C</i> = 17° 5' 49''·56
		52·01	51·09	50·10	49·12	50·64	47·34	50·10	47·59	48·45	
R M & XXXIV	h 8·90 h 8·28	h 8·12 h 7·94	l 7·58 l 8·18	l 7·98 l 8·56	h 8·38 h 8·86	h 11·46 h 9·60 h 10·58	h 9·24 h 8·38	h 9·64 h 10·74	h 10·14 h 10·02 d 7·61	l 8·62 l 10·36 l 10·50	<i>M</i> = 9''·00 <i>w</i> = 9·51 $\frac{1}{w}$ = 0·11 <i>C</i> = 9° 23' 9''·02
		8·59	8·03	7·88	8·27	8·62	10·55	8·81	10·19	9·26	
XXXIV & XXXV	h 24·74 h 26·34	h 24·62 h 25·60	l 25·44 l 24·92	l 26·60 l 25·44	h 24·28 h 24·40	h 26·34 h 26·12 h 25·80	h 23·54 h 25·06	h 22·66 h 23·80	h 23·14 h 27·60 d 22·90	l 27·08 l 23·52 l 24·28	<i>M</i> = 24''·93 <i>w</i> = 7·89 $\frac{1}{w}$ = 0·13 <i>C</i> = 34° 59' 24''·94
		25·54	25·11	25·18	26·02	24·34	26·09	24·30	23·23	24·55	

At XXXVII													
April 1851, observed by Mr. G. Logan with Troughton and Simms' 24-inch Tivo lollite.													
Angle between	Circle readings, telescope being set on XXXII											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	0°2'	180°2'	313°58'	133°58'	20°3'	200°3'	334°0'	154°0'	40°6'	220°6'	354°3'		174°3'
XXXIV & XXXII	"	"	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 14''·71 <i>w</i> = 10·77 $\frac{1}{w}$ = 0·09 <i>C</i> = 56° 4' 14''·70
	l 12°70'	l 14°87'	l 16°10'	l 15°13'	l 12°63'	l 13°06'	l 17°27'	l 14°43'	l 14°46'	l 12°60'	l 13°93'	l 16°07'	
	l 14°57'	l 14°97'	l 15°53'	l 14°70'	l 14°63'	l 15°30'	l 16°30'	l 15°20'	l 14°40'	l 13°96'	l 15°30'	l 14°33'	
				l 14°50'	l 14°20'		l 14°70'						
	13°64'	14°92'	15°82'	14°92'	13°92'	14°19'	16°79'	14°78'	14°43'	13°28'	14°62'	15°20'	
XXXIV & XXXVI	l 20°50'	l 19°77'	l 18°73'	l 18°63'	l 20°63'	l 21°84'	l 19°26'	l 18°17'	l 19°17'	l 20°73'	l 18°60'	l 16°96'	<i>M</i> = 19''·22 <i>w</i> = 7·02 $\frac{1}{w}$ = 0·14 <i>C</i> = 71° 26' 19''·24
	l 20°80'	l 20°03'	l 20°10'	l 18°73'	l 19°73'	l 19°40'	l 17°43'	l 21°50'	l 16°73'	l 20°40'	l 17°20'	l 18°07'	
				l 19°47'	l 21°07'		l 17°20'						
	20°65'	19°90'	19°42'	18°68'	19°94'	20°77'	18°35'	18°96'	17°95'	20°57'	17°90'	17°52'	
XXXVI & XXXVIII	h 21°36'	h 23°96'	h 24°00'	h 27°73'	l 22°04'	l 22°73'	l 21°77'	l 26°10'	l 23°50'	l 24°47'	l 22°67'	l 24°17'	<i>M</i> = 23''·98 <i>w</i> = 7·32 $\frac{1}{w}$ = 0·14 <i>C</i> = 47° 2' 23''·98
	h 23°37'	h 23°73'	h 25°17'	h 26°10'	l 23°27'	l 25°03'	l 22°23'	l 22°56'	l 25°64'	l 22°77'	l 26°53'	l 24°93'	
	h 22°73'		h 24°03'		l 24°33'	d 24°66'	l 26°07'			h 21°74'			
	22°49'	23°85'	24°59'	25°95'	22°66'	24°03'	22°89'	24°91'	24°57'	23°62'	23°65'	24°55'	
XXXVIII & XL	d 48°11'	d 48°65'	d 46°74'	d 46°79'	d 48°21'	l 45°17'	l 46°40'	l 45°93'	l 47°60'	l 47°83'	l 49°67'	l 48°60'	<i>M</i> = 47''·66 <i>w</i> = 9·06 $\frac{1}{w}$ = 0·11 <i>C</i> = 58° 11' 47''·64
	d 48°84'	d 46°78'	d 47°68'	d 46°65'	d 48°81'	l 46°10'	l 48°27'	l 48°37'	l 47°20'	l 47°70'	l 47°83'	l 49°10'	
					l 44°50'	d 50°00'	l 46°90'						
	48°48'	47°72'	47°21'	46°72'	48°51'	45°26'	48°22'	47°07'	47°40'	47°77'	48°75'	48°85'	
At XXXVIII													
December 1851, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.													
Angle between	Circle readings, telescope being set on R M											<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle	
	0°1'	180°1'	7°13'	187°13'	14°25'	194°25'	21°37'	201°36'	23°48'	206°48'			
R M & XL	h 19°48'	d 16°74'	l 19°02'	l 23°32'	h 21°86'	h 22°64'	l 17°70'	l 21°82'	h 22°66'	h 22°30'			<i>M</i> = 21''·02 <i>w</i> = 3·34 $\frac{1}{w}$ = 0·30 <i>C</i> = 32° 21' 21''·02
	h 19°82'	d 20°76'	l 19°18'	l 22°76'	h 21°26'	h 23°30'	l 20°62'	d 21°25'	h 21°02'	h 21°54'			
		d 19°88'				d 23°80'							
	19°65'	19°13'	19°10'	23°04'	21°56'	23°25'	19°16'	21°54'	21°84'	21°92'			



At XXXVIII—(Continued.)											
December 1851, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on R M										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 13'	14° 25'	194° 25'	21° 37'	201° 36'	28° 48'	208° 48'	
XL & XXXVII	"	"	"	"	"	"	"	"	"	"	M = 13''·48 w = 10·60 $\frac{1}{w}$ = 0·09 C = 52° 35' 13''·47
	h 16'80 h 13'48	h 13'40 h 13'10	l 14'62 l 13'92	l 11'22 l 13'86 l 14'50	h 11'62 h 14'42 h 12'96	h 13'64 h 12'96	l 13'50 l 13'16	l 12'32 l 12'80	h 12'34 h 14'50	h 13'90 h 12'80	
	15'14	13'25	14'27	13'19	13'00	13'30	13'33	12'56	13'42	13'35	
XXXVII & XXXVI	h 59'50 h 59'72 h 58'72	h 59'64 h 60'30	l 58'98 l 61'08	l 61'02 l 58'12	h 61'54 h 58'48 h 60'24	h 58'40 h 60'36	l 60'60 l 61'56	l 59'76 l 59'64	h 59'30 h 59'30	h 58'34 h 59'24	M = 59''·72 w = 14·02 $\frac{1}{w}$ = 0·07 C = 64° 52' 59''·72
	59'31	59'97	60'03	59'57	60'09	59'38	61'08	59'70	59'30	58'79	
XXXVI & XXXIX	h 9'96 h 12'48 h 9'86	h 9'00 h 7'08	l 7'30 l 7'08	l 3'88 l 6'14	h 7'48 h 8'68	h 10'56 h 8'06	l 9'26 l 8'82	l 7'48 l 8'68	h 8'56 h 9'84	h 7'52 h 8'38	M = 8''·27 w = 3·72 $\frac{1}{w}$ = 0·27 C = 62° 19' 8''·28
	10'77	8'04	7'19	5'01	8'08	9'31	9'04	8'08	9'20	7'95	
XXXIX & (XIX)	h 24'16 h 23'28	h 22'66 h 23'74	l 25'36 l 24'52	l 26'00 l 26'66	h 22'52 h 21'92	h 21'32 h 21'86	l 23'02 l 20'98	l 21'92 l 20'56	h 23'38 h 21'84	h 23'30 h 22'82	M = 23''·09 w = 3·80 $\frac{1}{w}$ = 0·26 C = 69° 0' 23''·09
	23'72	23'20	24'94	26'33	22'22	21'59	22'00	21'24	22'61	23'06	
(XIX) & (XVIII)	h 19'66 h 18'74	h 20'96 h 20'12	l 19'84 l 20'26	l 22'90 l 18'70	h 22'62 h 23'02	h 20'48 h 22'46	l 19'74 l 22'14	l 24'62 l 23'56	h 20'04 h 18'64	h 22'20 h 22'60	M = 21''·17 w = 3·50 $\frac{1}{w}$ = 0·29 C = 55° 24' 21''·17
	19'20	20'54	20'05	20'80	22'82	21'47	20'94	24'09	19'34	22'40	
(XVIII) & R M	h 35'42 h 33'56	h 34'70 h 34'54	l 35'74 l 34'80	l 31'88 l 32'22	h 31'24 h 33'58	h 31'74 h 32'46 d 32'93	l 35'96 l 32'98 l 35'78	l 33'22 l 32'24	h 33'80 h 33'14	h 33'18 h 32'62	M = 33''·52 w = 5·88 $\frac{1}{w}$ = 0·17 C = 23° 26' 33''·52
	34'49	34'62	35'27	32'05	32'41	32'38	34'91	32'73	33'47	32'90	

NOTE.—(XVIII) and (XIX) appertain to base-line figures.

At XXXIX											
<i>January 1852, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on (XIX)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	186° 1'	7° 13'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
XXXVIII & (XIX)	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 45''·46 <i>w</i> = 5·71 $\frac{1}{w}$ = 0·18 <i>C</i> = 47° 51' 45''·46
	<i>h</i> 45'·32	<i>h</i> 44'·80	<i>h</i> 44'·10	<i>h</i> 43'·92	<i>h</i> 45'·06	<i>h</i> 47'·44	<i>h</i> 46'·22	<i>h</i> 46'·08	<i>h</i> 45'·92	<i>h</i> 47'·92	
	<i>h</i> 45'·20	<i>h</i> 43'·62	<i>h</i> 44'·08	<i>h</i> 43'·42	<i>h</i> 45'·62	<i>h</i> 46'·36	<i>h</i> 45'·10	<i>h</i> 46'·92	<i>h</i> 44'·66	<i>h</i> 47'·40	
	45'·26	44'·21	44'·09	43'·67	45'·34	46'·93	45'·66	46'·50	45'·29	47'·66	
XXXVIII & XXXVI	<i>h</i> 60'·52	<i>h</i> 61'·52	<i>h</i> 61'·58	<i>h</i> 62'·34	<i>h</i> 59'·74	<i>h</i> 60'·18	<i>h</i> 61'·66	<i>l</i> 61'·72	<i>l</i> 59'·80	<i>l</i> 58'·50	<i>M</i> = 0''·66 <i>w</i> = 6·50 $\frac{1}{w}$ = 0·15 <i>C</i> = 49° 49' 0''·66
	<i>h</i> 59'·84	<i>h</i> 61'·84	<i>h</i> 61'·90	<i>h</i> 61'·40	<i>h</i> 61'·08	<i>h</i> 61'·24	<i>h</i> 60'·86	<i>l</i> 61'·06	<i>l</i> 58'·34	<i>l</i> 58'·12	
	60'·18	61'·68	61'·74	61'·87	60'·41	60'·71	61'·26	61'·39	59'·07	58'·31	
At XL											
<i>November 1851, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XXXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 13'	187° 13'	14° 30'	194° 30'	21° 37'	201° 37'	28° 49'	208° 49'	
XXXVII & XXXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 5''·90 <i>w</i> = 6·04 $\frac{1}{w}$ = 0·17 <i>C</i> = 69° 13' 5''·90
	<i>l</i> 5'·24	<i>l</i> 6'·04	<i>l</i> 5'·62	<i>l</i> 6'·76	<i>l</i> 3'·20	<i>l</i> 8'·02	<i>l</i> 3'·00	<i>l</i> 6'·98	<i>l</i> 7'·00	<i>l</i> 5'·42	
	<i>l</i> 7'·20	<i>l</i> 5'·38	<i>l</i> 5'·10	<i>l</i> 6'·74	<i>l</i> 5'·42	<i>l</i> 7'·80	<i>l</i> 4'·64	<i>l</i> 5'·86	<i>l</i> 6'·42	<i>l</i> 4'·20	
	6'·22	5'·71	5'·36	6'·75	5'·27	7'·91	3'·82	6'·42	6'·71	4'·81	
XXXVIII & (XVIII)	<i>l</i> 59'·18	<i>l</i> 59'·60	<i>l</i> 58'·80	<i>l</i> 62'·12	<i>l</i> 60'·30	<i>l</i> 60'·14	<i>l</i> 61'·14	<i>l</i> 61'·30	<i>l</i> 58'·42	<i>l</i> 60'·16	<i>M</i> = 59''·89 <i>w</i> = 10·90 $\frac{1}{w}$ = 0·09 <i>C</i> = 55° 57' 59''·89
	<i>l</i> 58'·20	<i>l</i> 58'·32	<i>l</i> 60'·34	<i>l</i> 59'·10	<i>l</i> 60'·10	<i>l</i> 59'·46	<i>l</i> 60'·66	<i>l</i> 60'·96	<i>l</i> 59'·80	<i>l</i> 59'·60	
	58'·69	58'·96	59'·57	60'·61	60'·20	59'·80	60'·90	61'·13	59'·11	59'·88	

NOTE.—(XVIII) and (XIX) appertain to base-line figures.

At (XVIII)											
<i>December 1851, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XL										M = Mean of Groups w = Relative Weight C = Concluded Angle
	24° 41'	204° 41'	31° 53'	211° 52'	39° 5'	219° 4'	46° 16'	226° 16'	58° 28'	233° 28'	
XL & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 12''·76 w = 6·00 $\frac{1}{w}$ = 0·17 C = 68° 14' 12''·76
	h 10·84	h 12·28	l 13·12	l 13·78	l 15·08	l 14·34	l 10·80	h 11·50	h 12·32	h 14·28	
	h 12·94	h 12·68	l 12·08	l 10·80	l 15·26	l 14·40	l 12·52	h 12·86	h 11·30	h 12·10	
XL & XXXVIII & (XIX)	11·89	12·48	12·60	12·29	15·17	14·37	11·66	12·18	11·81	13·19	M = 30''·07 w = 5·20 $\frac{1}{w}$ = 0·19 C = 61° 12' 30''·07
	l 29·08	h 32·12	l 31·74	l 29·40	l 30·68	l 30·84	l 30·82	l 28·44	h 28·28	h 27·96	
	l 30·22	h 30·28	l 32·78	l 32·24	l 31·02	l 28·98	l 29·92	l 29·68	h 28·10	h 28·82	
XXXVIII & (XIX)	29·65	31·20	32·26	30·82	30·85	29·91	30·37	29·06	28·19	28·39	
	At (XIX)										
	<i>January 1852, observed by Mr. G. Logan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>										
Angle between	Circle readings, telescope being set on (XVIII)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	83° 58'	263° 58'	91° 9'	271° 9'	98° 20'	276° 20'	106° 33'	285° 33'	112° 45'	292° 45'	
(XVIII) & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 14''·54 w = 8·10 $\frac{1}{w}$ = 0·12 C = 63° 23' 14''·54
	h 14·40	h 15·64	h 13·94	h 15·46	l 15·74	l 13·00	h 15·54	h 14·48	l 12·48	l 16·62	
	h 15·00	h 13·72	h 15·44	l 13·80	l 13·12	l 12·88	h 16·58	h 13·36	l 14·62	l 15·04	
XXXVIII & XXXIX	14·70	14·68	14·69	14·63	14·43	12·94	16·06	13·92	13·55	15·83	M = 0''·03 w = 4·30 $\frac{1}{w}$ = 0·23 C = 63° 8' 0''·03
	h 59·82	h 58·32	h 59·32	h 62·88	l 60·24	l 62·60	h 59·14	h 57·58	l 60·10	l 59·44	
	h 59·16	h 60·40	h 59·22	l 62·64	l 60·80	l 62·04	h 58·24	h 58·76	l 60·00	l 59·82	
XXXVIII & XXXIX	59·49	59·36	59·27	62·76	60·52	62·32	58·69	58·17	60·05	59·63	

NOTE.—(XVIII) and (XIX) appertain to base-line figures.



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
(X)	(XI) & I	29	29'94	12	29'90	
"	I & II	30	53'15	12	14'48	
(XI)	I & II	30	59'51	12	23'59	
"	II & (X)	31	59'59	12	23'71	
I	IV & III	37	80'81	12	25'35	
"	III & II	32	64'86	12	20'18	
"	II & (X)	27	26'95	12	19'14	
"	(X) & (XI)	29	46'19	12	14'00	
II	(X) & (XI)	25	27'33	12	34'95	
"	(XI) & I	30	105'03	12	32'80	
"	I & III	37	154'52	12	30'90	
"	III & V	38	144'76	12	60'83	
III	I & IV	30	88'99	12	21'71	
"	IV & VI	31	57'76	12	26'08	
"	VI & VII	31	42'23	12	42'29	
"	VII & V	27	27'94	12	20'91	
"	V & II	27	28'52	12	31'81	
"	II & I	29	44'17	12	27'81	
IV	VI & III	30	44'79	12	23'18	
"	III & I	29	71'51	12	9'75	
V	II & III	30	39'86	12	15'28	
"	III & VII	31	63'85	12	30'23	
"	VII & IX	34	96'42	12	40'27	
VI	VIII & IX	36	99'48	12	95'16	
"	IX & VII	28	67'95	12	33'78	
"	VII & III	38	101'31	12	35'94	
"	III & IV	37	63'99	12	12'54	
VII	III & VI	26	51'11	12	13'92	
"	VI & VIII	25	51'40	12	29'00	
"	VIII & IX	29	28'72	12	6'54	
"	IX & V	28	55'82	12	39'84	
"	V & III	27	26'12	12	37'92	

NOTE.—(X) and (XI) appertain to base-line figures.

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
VIII	X & XI	42	199'55	12	53'42	
"	XI & IX	34	132'14	12	39'45	
"	IX & VII	38	116'93	12	17'89	
"	VII & VI	41	184'01	12	18'32	
IX	V & VII	32	88'80	12	24'80	
"	VII & VI	32	122'00	12	21'73	
"	VI & VIII	30	80'75	12	34'40	
"	VIII & X	32	59'04	12	16'89	
"	X & XI	32	86'94	12	32'85	
X	XIII & XIV	21	4'63	10	8'87	
"	XIV & XII	20	4'16	10	13'74	
"	XII & XI	27	39'46	10	9'36	
"	XI & IX	30	53'35	12	39'65	
"	IX & VIII	30	50'49	12	58'82	
XI	IX & VIII	24	20'96	12	29'05	
"	VIII & X	29	50'30	12	20'77	
"	X & XII	24	22'25	10	36'99	
"	XII & XVI	23	17'20	10	20'88	
XII	XVI & XI	25	46'51	10	16'53	
"	XI & X	22	42'62	10	6'57	
"	X & XIII	24	40'99	10	5'28	
"	X & XIII	20	5'64	10	13'68	
"	XIII & XIV	21	21'75	10	13'96	
"	XIII & XIV	22	14'79	10	9'29	
"	XIV & XV	22	25'94	10	30'91	
"	XV & XVI	25	39'54	10	10'83	
XIII	XIV & XII	24	8'87	10	51'07	
"	XII & X	22	23'58	10	8'76	
XIV	XV & XII	27	67'43	10	17'29	
"	XII & X	21	7'74	10	7'40	
"	X & XIII	21	7'17	10	4'59	
XV	XVIII & XVII	23	45'77	10	46'86	
"	XVII & XVI	27	52'62	10	11'03	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XV	XVI & XII	36	117.21	10	16.22	
"	XII & XIV	29	85.74	10	15.55	
XVI	XI & XII	23	23.72	10	35.23	
"	XII & XV	26	23.89	10	30.52	
"	XV & XVII	24	55.74	10	14.61	
"	XVII & XIX	35	76.24	10	21.00	
XVII	XV & XVIII	26	44.68	10	54.68	
"	XVIII & XX	23	41.62	10	41.19	
"	XX & XXI	22	30.07	10	39.23	
"	XXI & XIX	23	54.92	10	14.31	
"	XIX & XVI	22	71.40	10	17.69	
"	XVI & XV	23	32.95	10	22.78	
XVIII	XX & R.M.	36	158.50	10	58.25	
"	XX & R.M.	36	69.83	10	45.97	
"	R.M. & XVII	39	238.12	10	108.43	
"	R.M. & XVII	39	209.94	10	68.81	
"	XVII & XV	30	110.32	10	38.18	
"	XVII & XV	37	328.28	10	35.08	
XIX	XVI & XVII	26	37.27	10	19.12	
"	XVII & XXI	25	33.69	10	24.38	
XX	XXIII & XXIV	21	36.54	10	70.30	
"	XXIV & XXII	20	16.74	10	39.05	
"	XXII & XXI	21	26.91	10	21.28	
"	XXI & XVII	21	17.40	10	18.55	
"	XVII & XVIII	21	18.69	10	27.46	
XXI	XIX & XVII	28	43.99	10	8.43	
"	XVII & XX	21	18.22	10	10.16	
"	XX & XXIV	21	5.25	10	22.99	
"	XXIV & XXII	20	20.08	10	4.90	
XXII	XXI & XX	23	42.35	10	40.95	
"	XX & XXIII	23	37.52	10	39.56	
"	XXIII & XXIV	20	29.22	10	48.44	

R. M. denotes "Referring-mark."

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XXII	XXIV & XXV	20	21'08	10	34'78	
XXIII	XXVII & XXVI	25	26'49	10	78'86	
"	XXVI & XXV	26	37'08	10	51'00	
"	XXV & XXIV	22	17'40	10	21'47	
"	XXIV & XXII	24	27'09	10	24'57	
"	XXII & XX	24	45'74	10	60'80	
XXIV	XXIII & XXV	20	9'76	10	25'30	
"	XXV & XXII	21	17'46	10	13'13	
"	XXII & XXI	23	14'37	10	17'88	
"	XXI & XX	23	14'45	10	21'75	
XXV	XXII & XXIV	20	36'64	10	34'23	
"	XXIV & XXIII	23	33'44	10	10'41	
"	XXIII & XXVI	25	33'84	10	19'65	
"	XXVI & XXVII	21	12'30	10	22'06	
"	XXVII & XXVIII	26	18'32	12	30'21	
"	XXVIII & XXIX	26	22'32	12	9'49	
XXVI	XXVII & R.M.	28	64'45	10	15'72	
"	R.M. & XXV	24	16'14	10	44'56	
"	XXV & XXIII	22	22'98	10	46'27	
XXVII	XXVIII & XXIX	30	27'11	12	7'02	
"	XXIX & XXV	30	15'36	12	19'74	
"	XXV & XXVI	22	26'28	10	25'56	
"	XXVI & XXIII	25	70'00	10	18'13	
XXVIII	XXX & XXXI	26	16'13	12	10'38	
"	XXXI & XXIX	26	29'49	12	39'87	
"	XXIX & XXV	25	8'17	12	22'19	
"	XXV & XXVII	25	20'61	12	8'51	
XXIX	XXV & XXVII	25	11'40	12	7'94	
"	XXVII & XXVIII	24	7'50	12	20'15	
"	XXVIII & XXX	26	22'57	12	7'10	
"	XXX & XXXI	26	16'58	12	14'18	
XXX	XXXV & XXXIV	27	14'02	12	19'09	

R. M. denotes "Referring-mark."



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XXX	XXXIV & XXXII	27	24'53	12	8'10	
"	XXXII & XXXIII	27	22'43	12	17'53	
"	XXXIII & XXXI	28	17'66	12	18'29	
"	XXXI & XXIX	27	25'69	12	2'67	
"	XXIX & XXVIII	28	17'97	12	15'94	
XXXI	XXIX & XXVIII	30	21'49	12	11'01	
"	XXVIII & XXX	30	33'36	12	11'78	
"	XXX & XXXII	26	21'07	12	11'43	
"	XXXII & XXXIII	30	11'39	12	35'06	
XXXII	XXXIII & XXXI	29	45'81	12	17'15	
"	XXXI & XXX	27	12'92	12	9'93	
"	XXX & XXXIV	28	33'05	12	12'31	
"	XXXIV & XXXVII	28	38'58	12	9'97	
XXXIII	XXXI & XXX	27	22'72	12	11'24	
"	XXX & XXXII	25	12'73	12	10'21	
XXXIV	XXXVII & XXXII	27	9'23	12	10'12	
"	XXXII & XXX	29	15'32	12	11'54	
"	XXX & XXXV	27	19'25	12	12'76	
"	XXXV & XXXVI	26	14'76	12	42'62	
"	XXXVI & XXXVII	25	9'04	12	14'12	
XXXV	XXXVI & XXXIV	25	23'95	12	29'55	
"	XXXIV & XXX	28	36'57	12	11'92	
XXXVI	XXXIX & XXXVIII	24	28'49	10	10'86	
"	XXXVIII & XXXVII	25	16'19	10	9'29	
"	XXXVII & R.M.	25	11'83	10	20'38	
"	R.M. & XXXIV	23	9'63	10	7'65	
"	XXXIV & XXXV	23	25'55	10	6'78	
XXXVII	XXXII & XXXIV	27	11'16	12	10'04	
"	XXXIV & XXXVI	27	21'35	12	14'64	
"	XXXVI & XXXVIII	30	43'24	12	11'19	
"	XXXVIII & XL	27	15'33	12	11'58	
XXXVIII	R.M. & XL	22	16'06	10	23'69	

R. M. denotes "Referring-mark."

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XXXVIII	XL & XXXVII	22	19'13	10	4'66	
"	XXXVII & XXXVI	22	14'67	10	3'50	
"	XXXVI & XXXIX	21	14'67	10	20'81	
"	XXXIX & (XIX)	20	6'16	10	22'18	
"	(XIX) & (XVIII)	20	16'22	10	21'92	
"	(XVIII) & R.M.	22	12'14	10	12'83	
XXXIX	(XIX) & XXXVIII	21	3'48	10	14'84	
"	XXXVIII & XXXVI	20	3'94	10	12'90	
XL	XXXVII & XXXVIII	21	13'11	10	12'04	
"	XXXVIII & (XVIII)	20	8'60	10	6'20	
(XVIII)	XL & XXXVIII	20	12'58	10	12'12	
"	XXXVIII & (XIX)	20	10'24	10	14'92	
(XIX)	(XVIII) & XXXVIII	20	12'64	10	7'98	
"	XXXVIII & XXXIX	20	3'90	10	19'67	

NOTE.—(XVIII) and (XIX) appertain to base-line figures.  
R. M. denotes "Referring-mark."

From the preceding data of the sums of squares of the apparent errors, in the measurement of each angle, we may ascertain the *e. m. s.* (error of mean square) of observation of a single measure of an angle, and the *e. m. s. of graduation and observation* of the mean of the measures on a single zero, for each group of angles measured with the same instrument, by the same observer, and under similar circumstances.

Almost all the stations were situated on hill peaks, the few exceptions being on high mounds and undulations, having a considerable command over the general level of the ground; all the stations may therefore be considered as appertaining to triangulation in hills.

The observations must be divided into 5 groups.

- I. 45 angles measured by Captain Du Vernet, with Colonel Waugh's 24-inch theodolite No. 1 (having 5 microscopes to read the azimuthal circle), on 6 pairs of zeros (*face right* and *face left*), giving circle readings at 6° apart.
- II. 23 angles measured by Captain Du Vernet, with the above instrument, on 5 pairs of zeros, giving circle readings at 7° 12' apart.
- III. 28 angles measured by Mr. Geo. Logan, with the above instrument, on 5 pairs of zeros.
- IV. 40 angles measured by Captain Du Vernet with Colonel Waugh's 24-inch theodolite No. 2 (5 microscopes) on 5 pairs of zeros.
- V. 39 angles measured by Mr. Geo. Logan with Troughton and Simms' 24-inch theodolite No. 2 (3 microscopes) on 6 pairs of zeros, giving circle readings at 10° apart.

$$\left. \begin{array}{l} \text{The } e. m. s. \text{ of observation of a single measure} \\ \text{of an angle} \end{array} \right\} = \sqrt{\frac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$$

$$\left. \begin{array}{l} \text{The } e. m. s. \text{ of graduation and observation of} \\ \text{the mean of the measures on a single zero} \end{array} \right\} = \sqrt{\frac{\text{Sum of squares of apparent errors of zero.}}{\text{No. of angles} \times (\text{No. of changes of zero} - 1).}}$$

Group.	Instrument and Observer.	Position of stations.	Intervals between microscope readings of circle.	Number of				<i>e. m. s.</i> of observation of a single measure.	<i>e. m. s.</i> of graduation and observation of a single zero.
				Measures on each zero (average).	Angles.	Single measures.	Single zeros.		
I	{ Waugh's 24" No. 1. Capt. Du Vernet.	Hills,	6° 0'	2.60	45	1404	540	$\left\{ \frac{3249.84}{1404-540} \right\}^{\frac{1}{2}} = \pm 1''.939$	$\left\{ \frac{1331.83}{45(12-1)} \right\}^{\frac{1}{2}} = \pm 1''.640$
II	ditto	do.	7° 12'	2.53	23	583	230	$\left\{ \frac{1030.16}{583-230} \right\}^{\frac{1}{2}} = \pm 1''.708$	$\left\{ \frac{423.20}{23(10-1)} \right\}^{\frac{1}{2}} = \pm 1''.430$
III	{ Waugh's 24" No. 1. Mr. Logan.	do.	"	2.16	28	604	280	$\left\{ \frac{378.12}{604-280} \right\}^{\frac{1}{2}} = \pm 1''.080$	$\left\{ \frac{378.99}{28(10-1)} \right\}^{\frac{1}{2}} = \pm 1''.226$
IV	{ Waugh's 24" No. 2. Capt. Du Vernet.	do.	"	2.45	40	980	400	$\left\{ \frac{2093.04}{980-400} \right\}^{\frac{1}{2}} = \pm 1''.900$	$\left\{ \frac{1466.45}{40(10-1)} \right\}^{\frac{1}{2}} = \pm 2''.018$
V	{ Troughton's 24" No. 2. Mr. Logan.	do.	10° 0'	2.25	39	1054	468	$\left\{ \frac{810.18}{1054-468} \right\}^{\frac{1}{2}} = \pm 1''.176$	$\left\{ \frac{598.57}{39(12-1)} \right\}^{\frac{1}{2}} = \pm 1''.181$



**PRINCIPAL TRIANGULATION. REDUCTION OF FIGURES.**

**NORTH-WEST HIMALAYA SERIES.**

Figure No. 37.

Observed Angles					Equations to be satisfied				Factor	
No.	Value			Reciprocal Weight					"	
	$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = -1.42,$	$\lambda_1$				
	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = +0.48,$	$\lambda_2$				
1	17	18	2.98	.27	$x_1$	$+x_2$	$+x_3$	$+x_4$	} $=e_3 = +2.20,$	$\lambda_3$
2	85	5	5.71	.25	$+x_5$	$+x_6$	$+x_7$	$+x_8$		
3	60	10	22.56	.25	$3.21x_1$	$-.09x_2$	$+ .57x_3$	$-3.18x_4$	} $=e_4 = +1.05,$	$\lambda_4$
4	17	26	30.98	.16	$+ .94x_5$	$-.69x_6$	$+ 1.00x_7$	$-1.56x_8$		
5	46	55	5.73	.19						
6	55	28	5.42	.37						
7	44	53	33.18	.31						
8	32	43	21.34	.37						

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-1.42	+1.08		-.04	+ .920	$\lambda_1 =$	+1.0926	-.0837	+ .0628	-.1923	-1.661	0.2203696
2	+0.48		+.89	-.07	-.411	$\lambda_2 =$		+1.1707	+ .0176	+ .0993	+0.826	1.9169800
3	+2.20			+1.97	+ .447	$\lambda_3 =$			+ .5211	-.0512	+1.010	0.0043214
4	+1.05		*		+5.553	$\lambda_4 =$			*		+0.449	1.6522463

Adopted angular errors in seconds

$x_1 = +.20$	$x_5 = +.57$
$x_2 = -.16$	$x_6 = +.89$
$x_3 = +.51$	$x_7 = +.19$
$x_4 = +.08$	$x_8 = -.08$

$[wx^2] = 5.45$



Figure No. 39.

Observed Angles					Equations to be satisfied						Factor	
No.	Value			Reciprocal Weight					"			
	o	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$= e_1 = -2.07,$	$\lambda_1$		
1	43	28	52.38	.19	$x_3$	$+x_4$	$-x_7$	$-x_8$	$= e_2 = +2.26,$	$\lambda_2$		
2	46	1	31.98	.43	$x_1$	$+x_2$	$+x_3$	$+x_4$	$= e_3 = -2.33,$	$\lambda_3$		
3	33	56	33.47	.54	$+x_5$	$+x_6$	$+x_7$	$+x_8$				
4	56	33	3.95	.51	$1.05 x_1$	$-.96 x_2$	$+1.49 x_3$	$-.66 x_4$	$= e_4 = +1.24,$	$\lambda_4$		
5	53	44	9.82	.36	$+.73 x_5$	$-1.39 x_6$	$+.87 x_7$	$-1.12 x_8$				
6	35	46	15.90	.22								
7	48	50	43.66	.26								
8.	41	38	51.99	.34								

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-2.07	+1.20		+ .04	- .170	$\lambda_1 =$	+ .8402	- .0149	- .0102	+ .0469	-1.691	0.2281436
2	+2.26		+1.65	+ .45	+ .623	$\lambda_2 =$		+ .6837	- .1053	- .1293	+1.662	0.2206310
3	-2.33		*	+2.85	+ .057	$\lambda_3 =$		*	+ .3674	+ .0130	-1.057	0.0240750
4	+1.24				+3.268	$\lambda_4 =$				+ .3328	-0.008	3.9030900

Adopted angular errors in seconds

$x_1 = - .52$	$x_5 = + .23$
$x_2 = - 1.18$	$x_6 = + .14$
$x_3 = + .32$	$x_7 = - .71$
$x_4 = + .31$	$x_8 = - .92$

$[wx^2] = 9.71$



Figure No. 40.

Observed Angles .				Equations to be satisfied										Factor		
No.	Value	Reciprocal Weight		$x_3$	$+x_4$	$+x_6$	...	$+x_{18}$	...	$=e_1 = -0.30,$	$\lambda_1$					
1	20 55 19.40	.11		$x_1$	$+x_2$	$+x_7$	...	$+x_{18}$	...	$=e_2 = +0.25,$	$\lambda_2$					
2	26 20 4.70	.16		$x_8$	$+x_{12}$	$+x_{15}$	...	$+x_{16}$	...	$=e_3 = -0.62,$	$\lambda_3$					
3	57 19 35.53	.16		$x_9$	$+x_{14}$	$+x_{18}$	...	...	...	$=e_4 = +0.57,$	$\lambda_4$					
4	72 41 11.08	.45		$x_{10}$	$+x_{17}$	$+x_{20}$	...	...	...	$=e_5 = -0.12,$	$\lambda_5$					
5	69 0 34.68	.27		$x_{11}$	$+x_5$	$+x_{19}$	...	...	...	$=e_6 = +1.25,$	$\lambda_6$					
6	49 59 15.38	.17		$x_1$	$+x_{12}$	$+x_{13}$	...	$+x_{16}$	...	$=e_7 = -0.06,$	$\lambda_7$					
7	57 44 36.41	.12		$x_8$	$+x_7$	$+x_9$	...	$+x_{11}$	...	$=e_8 = -0.63,$	$\lambda_8$					
8	49 22 6.82	.11		Equations between the factors												
9	89 57 41.67	.40		Co-efficients of												
10	49 47 35.12	.19		No. of	Value of											
11	63 8 43.97	.26		e	e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	
12	51 59 24.29	.59		1	-0.30	+0.78						+0.17	+0.371			
13	75 0 1.92	.15		2	+0.25		+0.54					+0.26	+0.12	+0.3232	+0.0001	
14	58 10 48.05	.29		3	-0.62			+0.87				+0.66	+0.11	-0.0950	+0.3493	
15	46 33 13.74	.10		4	+0.57				+0.98				+0.40	-0.2871		
16	32 5 15.72	.07		5	-0.12					+0.86			+0.19	-0.1495		
17	72 32 14.00	.29		6	+1.25						+0.98		+0.26	+0.3069		
18	31 51 32.88	.29		7	-0.06							+0.92			+0.5966	
19	47 50 45.56	.45		8	-0.63								+1.25		-0.190	
20	57 40 13.58	.38		9	+0.76									+2.3054	-0.7432	
				10	-2.33										+2.1742	
Values of the Factors																
Factor	Symbolical										Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$	$e_{10}$						
$\lambda_1 =$	+1.3410	+1.440	+1.349	+0.992	+0.533	+0.793	-1.404	-2.644	-0.0295	+0.0044	-1.583	1.1994535				
$\lambda_2 =$		3.2782	1.6749	1.447	0.734	2.587	2.2841	5.893	3.269	2.407	1.657	1.2193225				
$\lambda_3 =$			3.5561	2.662	1.446	1.551	3.2337	6.266	+0.354	3.226	1.6341	0.2132813				
$\lambda_4 =$				1.2739	1.399	0.757	2.927	4.941	1.769	0.936	+0.8903	1.9495461				
$\lambda_5 =$					1.2402	0.380	1.595	2.674	1.050	0.541	0.0229	2.3605934				
$\lambda_6 =$				*		1.1659	1.513	3.225	-1.911	-0.516	1.6280	0.2116464				
$\lambda_7 =$							+4.5359	+0.6608	0.780	0.7460	2.1300	0.3283694				
$\lambda_8 =$								1.2124	+0.0028	0.691	-0.9726	1.9879521				
$\lambda_9 =$										0.6079	+2.235	1.4792441				
$\lambda_{10} =$											0.6886	0.1775721				
Adopted angular errors in seconds																
$x_1 = -23$	$x_5 = +47$	$x_9 = -03$	$x_{13} = +36$	$x_{17} = -02$												
$x_2 = +37$	$x_6 = -19$	$x_{10} = 18$	$x_{14} = 19$	$x_{18} = +41$												
$x_3 = 01$	$x_7 = 25$	$x_{11} = +17$	$x_{16} = -28$	$x_{19} = 61$												
$x_4 = -12$	$x_8 = 15$	$x_{12} = -39$	$x_{18} = +20$	$x_{20} = 08$												
$[wx^2] = 7.34$																

Figure No. 41.

Observed Angles				Equations to be satisfied								Factor																																																																																																					
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1 = +0.49,$	$\lambda_1$	$x_1$	$+x_8$	$+x_{12}$	$=e_2 = -1.60,$	$\lambda_2$																																																																																																			
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = +0.42,$	$\lambda_3$	$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = -0.02,$	$\lambda_4$																																																																																																			
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = +0.24,$	$\lambda_5$	$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = -0.37,$	$\lambda_6$																																																																																																			
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$=e_7 = -0.12,$				$\lambda_7$																																																																																																		
1	38	53	46.97	.62	$\left. \begin{aligned} &+0.93x_3 - 0.25x_2 + 1.24x_1 - 0.63x_{12} + 0.01x_{11} - 1.52x_{16} \\ &+ 0.56x_{15} - 0.30x_{18} + 1.12x_{17} - 0.11x_{14} + 0.17x_{13} - 1.28x_4 \end{aligned} \right\} = e_8 = -1.95, \lambda_8$																																																																																																												
2	75	51	40.57	.20																																																																																																													
3	47	10	28.33	.27	<p style="text-align: center;">Equations between the factors</p> <table border="1"> <thead> <tr> <th rowspan="2">No. of e</th> <th rowspan="2">Value of e</th> <th colspan="8">Co-efficients of</th> </tr> <tr> <th><math>\lambda_1</math></th> <th><math>\lambda_2</math></th> <th><math>\lambda_3</math></th> <th><math>\lambda_4</math></th> <th><math>\lambda_5</math></th> <th><math>\lambda_6</math></th> <th><math>\lambda_7</math></th> <th><math>\lambda_8</math></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+0.49</td> <td>+0.79</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>+0.32</td> <td>+0.201</td> </tr> <tr> <td>2</td> <td>-1.60</td> <td></td> <td>+1.62</td> <td></td> <td></td> <td></td> <td></td> <td>+0.69</td> <td>+0.574</td> </tr> <tr> <td>3</td> <td>+0.42</td> <td></td> <td></td> <td>+1.79</td> <td></td> <td></td> <td></td> <td>+0.55</td> <td>-0.523</td> </tr> <tr> <td>4</td> <td>-0.02</td> <td></td> <td></td> <td></td> <td>+0.91</td> <td></td> <td></td> <td>+0.50</td> <td>+0.092</td> </tr> <tr> <td>5</td> <td>+0.24</td> <td></td> <td></td> <td></td> <td></td> <td>+0.76</td> <td></td> <td>+0.27</td> <td>+0.143</td> </tr> <tr> <td>6</td> <td>-0.37</td> <td></td> <td></td> <td>*</td> <td></td> <td></td> <td>+0.93</td> <td>+0.36</td> <td>-0.338</td> </tr> <tr> <td>7</td> <td>-0.12</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>+2.69</td> <td></td> </tr> <tr> <td>8</td> <td>-1.95</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>+2.928</td> </tr> </tbody> </table>										No. of e	Value of e	Co-efficients of								$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	1	+0.49	+0.79						+0.32	+0.201	2	-1.60		+1.62					+0.69	+0.574	3	+0.42			+1.79				+0.55	-0.523	4	-0.02				+0.91			+0.50	+0.092	5	+0.24					+0.76		+0.27	+0.143	6	-0.37			*			+0.93	+0.36	-0.338	7	-0.12							+2.69		8	-1.95								+2.928	
No. of e	Value of e	Co-efficients of																																																																																																															
		$\lambda_1$	$\lambda_2$	$\lambda_3$											$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$																																																																																														
1	+0.49	+0.79																+0.32	+0.201																																																																																														
2	-1.60		+1.62															+0.69	+0.574																																																																																														
3	+0.42			+1.79														+0.55	-0.523																																																																																														
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5	+0.24															+0.76		+0.27	+0.143																																																																																														
6	-0.37			*													+0.93	+0.36	-0.338																																																																																														
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4	37	55	30.83	.30																																																																																																													
5	56	57	53.86	.32																																																																																																													
6	83	11	17.33	.69																																																																																																													
7	57	33	31.84	.55																																																																																																													
8	46	11	38.97	.50																																																																																																													
9	54	26	18.86	.27																																																																																																													
10	61	39	19.02	.36																																																																																																													
11	89	9	0.63	.89																																																																																																													
12	57	54	55.61	.31																																																																																																													
13	80	25	11.74	.27																																																																																																													
14	83	51	11.95	.33																																																																																																													
15	60	45	37.56	.25																																																																																																													
16	33	17	29.68	.35																																																																																																													
17	41	42	31.12	.16																																																																																																													
18	73	2	45.91	.16																																																																																																													

Values of the Factors										
Factor	Symbolical								Numerical	Logarithmic
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$		
$\lambda_1 =$	+1.405	+0.157	+0.046	+0.158	+0.118	+0.058	-0.266	-0.123	+0.730	1.8633229
$\lambda_2 =$		+0.796	+0.038	+0.172	+0.131	+0.049	-0.282	-0.166	-0.814	1.9106244
$\lambda_3 =$			+0.648	+0.090	+0.044	+0.112	-0.184	+0.113	+0.002	3.3010300
$\lambda_4 =$				+1.298	+0.136	+0.113	-0.351	-0.063	-0.031	2.4913617
$\lambda_5 =$					+1.415	+0.056	-0.231	-0.093	+0.389	1.5899496
$\lambda_6 =$			*			+1.216	-0.232	+0.140	-0.688	1.8375884
$\lambda_7 =$							+0.633	+0.036	+0.136	1.1335389
$\lambda_8 =$								+0.425	-0.653	1.8149132

Adopted angular errors in seconds					
$x_1 = -1.00$	$x_4 = +0.04$	$x_7 = +0.08$	$x_{10} = -0.20$	$x_{13} = -0.21$	$x_{16} = +0.35$
$x_2 = +0.18$	$x_5 = +0.28$	$x_8 = +0.05$	$x_{11} = -0.01$	$x_{14} = +0.15$	$x_{17} = -0.05$
$x_3 = +0.03$	$x_6 = -0.47$	$x_9 = +0.14$	$x_{12} = -0.13$	$x_{15} = -0.10$	$x_{18} = +0.03$

$[wx^2] = 3.26$

Figure No. 42.

Observed Angles				Equations to be satisfied										Factor		
No.	Value	Reciprocal Weight		$x_3$	$+x_4$	$+x_5$	$+x_6$	...	...	...	$=e_1$	$=+1.03,$	$\lambda_1$			
1	50 38 59.41	.90		$x_1$	$+x_2$	$+x_7$	$+x_{12}$	...	...	...	$=e_2$	$=0.42,$	$\lambda_2$			
2	45 49 37.01	.48		$x_2$	$+x_3$	$+x_4$	$+x_{14}$	...	...	...	$=e_3$	$=0.13,$	$\lambda_3$			
3	55 4 34.64	.30		$x_8$	$+x_9$	$+x_{10}$	$+x_{11}$	$+x_{17}$	$+x_{18}$	...	$=e_4$	$=0.72,$	$\lambda_4$			
4	43 39 11.97	.27		$x_5$	$+x_7$	$+x_8$	$+x_{13}$	$+x_{14}$	...	...	$=e_5$	$=-1.36,$	$\lambda_5$			
5	18 36 2.25	.11		$x_9$	$+x_{16}$	$+x_{17}$	...	...	...	...	$=e_6$	$=+1.12,$	$\lambda_6$			
6	62 40 13.90	.55		$x_{10}$	$+x_{15}$	$+x_{18}$	...	...	...	...	$=e_7$	$=0.86,$	$\lambda_7$			
7	45 42 48.23	.52		$1.048x_4 - .70x_3 + .52x_6 - 2.9714x_5 + 2.78065x_{13} - .20(x_7 + x_8) + .97x_2 - 1.405x_{14}$										$=e_8$	$=-3.85225,$	$\lambda_8$
8	33 14 7.84	.63		$1.526x_9 - 1.861x_{11} + 6.07993x_{17} - 3.2564x_9 + .60x_{10} - 1.527x_{18}$										$=e_9$	$=2.61250,$	$\lambda_9$
9	17 4 16.49	.43		$.20(x_7 + x_8) - .97x_2 + 6.07993x_{17} - 3.2564x_9 + .60x_{10} - 1.527x_{18} + .82x_1 - .44(x_{11} + x_{12})$										$=e_{10}$	$=1.67675,$	$\lambda_{10}$
10	58 52 28.92	.28		Equations between the factors												
11	28 15 26.73	.33		No. of e	Value of e	Co-efficients of										
12	37 48 38.22	.76				$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	
13	19 46 48.38	.23		1	+1.03	+1.23					+0.321					
14	35 26 38.99	.27		2	0.42		+2.66				.3616		+0.420			
15	87 54 13.21	.30		3	0.13			+1.32			.1592		-.4656			
16	153 35 20.98	.19		4	0.72				+2.33	0.63	+0.91	+46	-1.260	+1.7585	+1.3921	
17	9 20 24.94	.48		5	-1.36					+2.13			+4958	.9614	-.2356	
18	33 13 22.09	.18		6	+1.12						+1.10			1.5181	+1.5181	
				7	0.86							+76		-1.069	-.1069	
				8	-3.85225			*						+4.3724	.1923	.4976
				9	2.61250										+25.4337	+23.2863
				10	1.67675										+24.1376	+24.1376
Values of the Factors																
Factor	Symbolical										Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$	$e_{10}$						
$\lambda_1 =$	+1.1055	+0.269	-.6299	-.1213	+2.392	+1.135	+0.721	-.0203	+0.169	-.0264	+9227	-	1.9650699			
$\lambda_2 =$		.5138	.0575	+1.218	-.3300	-.0982	-.0740	.0092	.1334	.1352	5127	-	1.7098464			
$\lambda_3 =$			+1.3576	.2583	.5119	.2417	.1535	+0.303	-.0362	+0.564	-1338	-	1.1263133			
$\lambda_4 =$				.9993	.4692	.8173	.6058	.0613	+0.186	-.0254	3613	-	1.5578079			
$\lambda_5 =$					+1.1385	+3.988	+2.829	-.0772	-.3165	+3.088	5483	-	1.7390024			
$\lambda_6 =$						1.6659	.4865	.0570	.0340	-.0245	+1.5468	-	0.1894454			
$\lambda_7 =$			*				1.6840	.0365	.0094	+0.200	1.3268	-	0.1228153			
$\lambda_8 =$								+2.399	.0046	.0092	8941	-	1.9513910			
$\lambda_9 =$										+4.693	4559	-	2.3554515			
$\lambda_{10} =$											1892	-	1.2768551			
Adopted angular errors in seconds																
$x_1 = +0.32$	$x_5 = +.39$	$x_9 = +.75$	$x_{13} = -.69$	$x_{17} = +.09$												
$x_2 = -.41$	$x_6 = +.25$	$x_{10} = +.24$	$x_{14} = +.15$	$x_{18} = +.22$												
$x_3 = +.43$	$x_7 = +.06$	$x_{11} = -.10$	$x_{15} = +.40$													
$x_4 = -.54$	$x_8 = -.47$	$x_{12} = +.45$	$x_{16} = +.28$													
$[wx^2] = 8.21$																

PRINCIPAL TRIANGULATION—REDUCTION OF FIGURES.

Figure No. 43.

Observed Angles									
No.	Value			Reciprocal Weight	Equations to be satisfied				Factor
	°	'	"						
1	5	0	56.09	.91	$x_2$	$+x_3$	$+x_6$	$= e_1 = -0.86,$	$\lambda_1$
2	32	2	59.10	.62	$x_4$	$+x_6$	$+x_7$	$= e_2 = -1.62,$	$\lambda_2$
3	61	42	47.78	.27	$x_1$	$+x_2$	$+x_3$	$= e_3 = -3.28,$	$\lambda_3$
4	23	0	37.80	.28	$+x_4$	$+x_7$	$+x_8$		
5	86	14	15.62	.56	$.54x_3$	$-1.60x_2$	$+1.06x_7$	$= e_4 = -3.33,$	$\lambda_4$
6	113	33	36.87	.80	$-2.35x_4$	$+11.39x_1$	$-3.79x_8$		
7	43	25	44.77	.34					
8	14	46	56.24	.32					

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-0.86	+1.45		+0.89	-0.846	$\lambda_1 =$	+1.0148	+2.234	-4.930	+0.386	+0.2538	$\bar{1}.4044745$
2	-1.62		+1.42	+0.62	-0.298	$\lambda_2 =$		+0.8580	-0.3400	+0.0251	-0.5503	$\bar{1}.7405916$
3	-3.28		*	+2.74	+0.008	$\lambda_3 =$		*	+0.7537	-0.0519	-1.3246	0.1220848
4	-3.33				+126.248	$\lambda_4 =$				+0.0115	+0.0581	$\bar{2}.7638022$

Adopted angular errors in seconds

$x_1 = -.60$        $x_5 = +.14$   
 $x_2 = -.72$        $x_6 = -.44$   
 $x_3 = -.28$        $x_7 = -.62$   
 $x_4 = -.56$        $x_8 = -.50$

$[wx^2] = 4.80$

Figure No. 44.

Observed Angles				Equations to be satisfied										Factor		
No.	Value			Reciprocal Weight												
				Equations to be satisfied												
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_8 = e_1 = + 1'90,$	$\lambda_1$							
1	20	1	53'77	·26	$x_3$	$+x_4$	$-x_7$	$-x_8 = e_2 = + 0'35,$	$\lambda_2$							
2	59	34	23'04	·17	$x_1$	$+x_2$	$+x_8$	$+x_4$	} = $e_3 = + 0'37,$	$\lambda_3$						
3	81	43	17'69	·08	$+x_5$	$+x_6$	$+x_7$	$+x_8$								
4	18	40	29'22	·10	$2'74x_1$	$-.59x_2$	$+1'15x_3$	$-2'96x_4$	} = $e_4 = + 11'97,$	$\lambda_4$						
5	13	21	36'13	·18	$+4'21x_5$	$-.44x_6$	$+1'13x_7$	$-3'10x_8$								
6	66	14	38'73	·17												
7	82	30	2'53	·08												
8	17	53	43'55	·11												

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	$+ 1''90$	$+78$		$+08$	$-071$	$\lambda_1 =$	$+1'2949$	$-.0057$	$-.1036$	$+0227$	$+2'692$	$0'4300751$
2	$+ 0'35$		$+37$	$-.01$	$+047$	$\lambda_2 =$		$+2'7064$	$+0366$	$-.0213$	$+0695$	$1'8419848$
3	$+ 0'37$		*	$+1'15$	$+0680$	$\lambda_3 =$		*	$+9299$	$-.0894$	$-.909$	$1'9585639$
4	$+ 11'97$				$+7'170$	$\lambda_4 =$				$+1483$	$+1'777$	$0'2496874$

Adopted angular errors in seconds

$x_1 = +1'73$	$x_5 = +.70$
$x_2 = +.13$	$x_6 = -.74$
$x_3 = .00$	$x_7 = -.12$
$x_4 = -.55$	$x_8 = -.78$

$[wx^2] = 26.33$

Figure No. 45.

Observed Angles			Equations to be satisfied								Factor	
No.	Value.		Reciprocal Weight									
	°	'	"									
1	25	20	12'66	09	$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = +.82,$	$\lambda_1$		
2	33	29	27'75	34	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = -.08,$	$\lambda_2$		
3	84	16	14'08	10	$x_1$	$+x_2$	$+x_3$	$+x_4$	$=e_3 = +.14,$	$\lambda_3$		
4	36	54	8'99	15	$+x_5$	$+x_6$	$+x_7$	$+x_8$				
5	16	56	7'04	06	$2.11x_1$	$-1.51x_2$	$+1.10x_3$	$-1.33x_4$	$=e_4 = +0.57,$	$\lambda_4$		
6	41	53	32'46	13	$+3.28x_5$	$-1.11x_6$	$+0.5x_7$	$-1.48x_8$				
7	87	7	24'75	11								
8	34	2	57'65	13								

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	$+.82$	$+.62$		$+.24$	$-.376$	$\lambda_1 =$	$+1.8445$	$+ .0072$	$-.2822$	$+.2020$	$+1.588$	$0.2008505$
2	$-.08$		$+.49$	$+.01$	$-.004$	$\lambda_2 =$		$+2.0412$	$-.0202$	$-.0008$	$-.160$	$1.2041200$
3	$+.14$		*	$+1.11$	$-.646$	$\lambda_3 =$		*	$+1.1014$	$+.2390$	$+.059$	$2.7708520$
4	$+.57$				$+2.533$	$\lambda_4 =$				$+.4857$	$+.476$	$1.6776070$

Adopted angular errors in seconds

$x_1 = +.25$	$x_5 = +.01$
$x_2 = +.32$	$x_6 = -.27$
$x_3 = .00$	$x_7 = +.03$
$x_4 = -.12$	$x_8 = -.08$

$[wx^2] = 1.59$

Figure No. 46.

Observed Angles										
No.	Value			Reciprocal Weight	Equations to be satisfied				Factor	
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = +.66,$	$\lambda_1$
1	25	31	47.28	.12	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = -.60,$	$\lambda_2$
2	56	2	55.24	.16	$x_1$	$+x_2$	$+x_3$	$+x_4$	$=e_3 = +.80,$	$\lambda_3$
3	70	45	9.03	.16	$+x_5$	$+x_6$	$+x_7$	$+x_8$		
4	27	40	12.92	.09	$+2.09x_1$	$-.67x_2$	$+.35x_3$	$-1.91x_4$	$=e_4 = +.95,$	$\lambda_4$
5	22	0	1.96	.19	$+2.48x_5$	$-.59x_6$	$+.32x_7$	$-2.05x_8$		
6	59	34	39.77	.10						
7	72	28	25.02	.12						
8	25	56	57.19	.28						

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	+.66	+.57		-.01	-.268	$\lambda_1 =$	+.18299	-.0999	+.0153	+.1600	+.1432	0.1559430
2	-.60		+.65	-.15	+.420	$\lambda_2 =$		+.17251	+.1940	-.2195	-.1153	0.0618293
3	+.80		*	+.122	-.090	$\lambda_3 =$		*	+.8438	+.0010	+.570	1.7558749
4	+.95				+.3338	$\lambda_4 =$				+.3401	+.561	1.7489629

Adopted angular errors in seconds

$x_1 = +.38$	$x_5 = +.10$
$x_2 = +.26$	$x_6 = -.12$
$x_3 = -.06$	$x_7 = +.23$
$x_4 = -.15$	$x_8 = +.16$

$[wx^2] = 2.62$

PRINCIPAL TRIANGULATION—REDUCTION OF FIGURES.

Figure No. 47.

Observed Angles					Equations to be satisfied							Factor		
No.	Value			Reciprocal Weight	$x_2$	$x_3$	$x_5$	" "						
					$x_1$	$x_6$	$x_{11}$	= $e_1 = -1.10$ , $\lambda_1$						
					$x_7$	$x_{10}$	$x_{13}$	= $e_2 = +0.11$ , $\lambda_2$						
					$x_8$	$x_{12}$	$x_{15}$	= $e_3 = -0.37$ , $\lambda_3$						
					$x_4$	$x_9$	$x_{14}$	= $e_4 = -1.25$ , $\lambda_4$						
					$x_5$	$x_6$	$x_7$	$x_8$	$x_9$	= $e_5 = +0.59$ , $\lambda_5$				
					+ $.61x_3$ - $1.35x_2$ + $.70x_1$ - $.73x_{11}$ + $.28x_{10}$ } = $e_6 = +.90$ , $\lambda_6$									
					- $1.43x_{13}$ + $2.01x_{12}$ - $.34x_{15}$ + $.67x_{14}$ - $.31x_4$ } = $e_7 = -.62$ , $\lambda_7$									
1	54	54	45.60	.17										
2	36	28	14.59	.10										
3	58	48	34.42	.14										
4	72	32	42.26	.13										
5	84	43	12.28	.11										
6	71	6	8.36	.13										
7	70	42	49.56	.34										
8	82	4	45.57	.12										
9	51	23	5.13	.09										
10	74	17	50.73	.27										
11	53	59	9.46	.14										
12	26	28	58.58	.36										
13	34	59	24.94	.13										
14	56	4	14.70	.09										
15	71	26	19.24	.14										
Equations between the factors														
		No. of e		Value of e		Co-efficients of								
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$		
1						+ .35					+ .11	- .050		
2							+ .44				+ .13	+ .017		
3								+ .74			+ .34	- .110		
4									+ .62		+ .12	+ .676		
5								*		+ .31	+ .09	+ .020		
6											+ .79			
7												+ 2.201		
Values of the Factors														
Factor	Symbolical							Numerical	Logarithmic					
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$							
$\lambda_1 =$	+ 3.056	+ .175	+ .287	+ .044	+ .171	- .603	+ .067	- 3.989	0.6008640					
$\lambda_2 =$		+ 2.448	+ .260	+ .177	+ .173	- .585	- .058	- .630	1.7993405					
$\lambda_3 =$			+ 1.767	+ .110	+ .254	- .888	+ .057	- 1.766	0.2469907					
$\lambda_4 =$				+ 2.562	+ .194	- .495	- .783	- 3.119	0.4940154					
$\lambda_5 =$			*		+ 3.398	- .578	- .076	+ 1.026	0.0111474					
$\lambda_6 =$						+ 1.969	+ .104	+ 2.915	0.4646386					
$\lambda_7 =$							+ .700	+ .494	1.6937269					
Adopted angular errors in seconds														
$x_1 = -.04$			$x_4 = +.10$			$x_7 = +.39$			$x_{10} = -.43$			$x_{13} = -.33$		
$x_2 = -.47$			$x_5 = -.12$			$x_8 = -.03$			$x_{11} = -.15$			$x_{14} = +.13$		
$x_3 = -.51$			$x_6 = +.30$			$x_9 = +.36$			$x_{12} = -.75$			$x_{15} = -.47$		
$[wx^2] = 11.81$														



Figure No. 48.

Observed Angles					Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_2$	$+ x_3$	$+ x_5$	$= e_1 = + .85,$	$\lambda_1$					
					$x_1$	$+ x_6$	$+ x_{12}$	$= e_2 = - .41,$	$\lambda_2$					
					$x_7$	$+ x_{11}$	$+ x_{18}$	$= e_3 = + .47,$	$\lambda_3$					
					$x_8$	$+ x_{16}$	$+ x_{17}$	$= e_4 = - .28,$	$\lambda_4$					
					$x_9$	$+ x_{14}$	$+ x_{15}$	$= e_5 = + .23,$	$\lambda_5$					
					$x_4$	$+ x_{10}$	$+ x_{13}$	$= e_6 = -1.23,$	$\lambda_6$					
					$x_5$	$+ x_6$	$+ x_7$	$+ x_8$	$+ x_9$	$+ x_{10}$			$= e_7 = +0.27,$	$\lambda_7$
1	67	51	58.28	.17	$+ .93 x_3$	$- .40 x_2$	$+ .41 x_1$	$- .84 x_{12}$	$+ .90 x_{11}$	$- .51 x_{18}$			$= e_8 = +1.47,$	$\lambda_8$
2	68	4	45.31	.13	$+ .50 x_{17}$	$- .55 x_{16}$	$+ .40 x_{15}$	$- .68 x_{14}$	$+ .38 x_{13}$	$- .62 x_4$				
3	47	2	23.98	.14										
4	58	11	47.64	.11										
5	64	52	59.72	.07										
6	62	19	8.28	.27										
7	69	0	23.09	.26										
8	55	24	21.17	.29										
9	55	47	54.54	.47										
10	52	35	13.47	.09										
11	47	51	45.46	.18										
12	49	49	0.66	.15										
13	69	13	5.90	.17										
14	55	57	59.89	.09										
15	68	14	12.76	.17										
16	61	12	30.07	.19										
17	63	23	14.54	.12										
18	63	8	0.03	.23										
Equations between the factors														
		No. of e		Value of e		Co-efficients of								
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	
1	+	.85	+ .34								+ .07	+ .078		
2	-	.41					+ .59				+ .27	- .056		
3	+	.47						+ .67			+ .26	+ .045		
4	-	.28							+ .60		+ .29	- .045		
5	+	.23								+ .73	+ .47	+ .007		
6	-	1.23					*				+ .37	+ .09	- .003	
7	+	0.27									+ 1.45			
8	+	1.47											+ .706	
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+ 3.073	+ .092	+ .128	+ .106	+ .178	+ .063	- .271	- .334	+ 2.003	0.3016809				
$\lambda_2 =$		+ 1.991	+ .229	+ .309	+ .395	+ .151	- .616	+ .150	- .758	1.8796692				
$\lambda_3 =$			+ 1.700	+ .244	+ .335	+ .125	- .519	- .090	+ .394	1.5954962				
$\lambda_4 =$				+ 1.989	+ .417	+ .159	- .649	+ .121	- .575	1.7596678				
$\lambda_5 =$			*		+ 1.926	+ .210	- .863	- .001	- .019	2.2787536				
$\lambda_6 =$						+ 2.782	- .326	+ .017	- 3.430	0.5352941				
$\lambda_7 =$							+ 1.341	- .022	+ .493	1.6928469				
$\lambda_8 =$								+ 1.477	+ 1.723	0.2362853				
Adopted angular errors in seconds														
$x_1 = - .02$	$x_4 = - .49$	$x_7 = + .23$	$x_{10} = - .26$	$x_{13} = - .48$	$x_{16} = - .28$									
$x_2 = + .18$	$x_5 = + .17$	$x_8 = - .02$	$x_{11} = + .34$	$x_{14} = - .09$	$x_{17} = + .02$									
$x_3 = + .50$	$x_6 = - .07$	$x_9 = + .22$	$x_{12} = - .32$	$x_{15} = + .10$	$x_{18} = - .10$									
$[wx^2] = 9.23$														

## PRINCIPAL TRIANGULATION. TRIANGLES.

### NORTH-WEST HIMALAYA SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
52		(X)	"	"	"	"	"	o ' "			
		(XI)	1'02	- '12	- '067		- '187	50 1 23'113	5'0745393,2	118724'21	22'486
		II	1'02	+ '16	+ '062		+ '222	85 5 4'912	5'1885385,1	154361'32	29'235
			1'02	- '19	+ '005		- '185	44 53 31'975	5'0388050,7	109346'54	20'710
			3'06				- '150	180 0 0'000			
53		(XI)	.88	- '51	+ '014		- '496	60 10 21'184	5'0578427,1	114246'45	21'638
		II	.88	- '89	- '065		- '955	55 28 3'585	5'0353847,7	108488'77	20'547
		I	.88	- '65	+ '051		- '599	64 21 35'231	5'0745393,2	118724'21	22'486
					2'64				- 2'050	180 0 0'000	
54	586	(X)	.53	- '20		- '061	- '261	17 18 2'189	5'0353847,7	108488'77	20'547
		(XI)	.54	- '35		+ '076	- '274	145 15 27'456	5'3178547,2	207900'11	39'375
		I	.53	- '08		- '015	- '095	17 26 30'355	5'0388050,7	109346'54	20'710
					1'60				- '630	180 0 0'000	
54		I	.68	- '06	+ '024		- '036	70 23 55'454	5'0613002,9	115159'63	21'811
		II	.67	- '49	- '078		- '568	40 26 27'202	4'8992456,1	79294'97	15'018
		III	.67	+ '03	+ '054		+ '084	69 9 37'344	5'0578427,1	114246'45	21'638
					2'02				- '520	180 0 0'000	
55		II	.64	- '99	- '058		- 1'048	53 53 19'772	4'9773044,9	94908'37	17'975
		III	.63	- '45	+ '082		- '368	47 30 55'072	4'9376974,7	86635'81	16'408
		V	.64	- '38	- '024		- '404	78 35 45'156	5'0613002,9	115159'63	21'811
					1'91				- 1'820	180 0 0'000	

NOTES.—1. The values of the side are given in the same line with the opposite angle.  
 2. (X) and (XI) appertain to base-line figures.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
56		III V VII	"	"	"	"	"	° ' "			
			.87	+ .62	+ .021		+ .641	77 16 5'34I	5'1291824,9	134642'60	25'500
			.87	+ .67	- .089		+ .581	59 17 40'67I	5'0743939,9	118684'51	22'478
			.86	+ .27	+ .068		+ .338	43 26 13'988	4'9773044,9	94908'37	17'975
			2'60				+ 1'560	180 0 0'000			
57		V VII IX	1'16	+ .43	- .083		+ .347	33 10 25'897	5'0599225,4	114794'88	21'741
			1'17	- .39	+ .080		- .310	106 54 3'220	5'3026164,5	200731'92	38'017
			1'17	- .39	+ .003		- .387	39 55 30'883	5'1291824,9	134642'60	25'500
			3'50				- .350	180 0 0'000			
58		VII IX VIII	.70	- .19	+ .030		- .160	75 7 44'740	5'0859423,3	121882'78	23'084
			.70	- .93	- .080		- 1'010	39 19 26'180	4'9026241,3	79914'23	15'135
			.70	- .79	+ .050		- .740	65 32 49'080	5'0599225,4	114794'88	21'741
			2'10				- 1'910	180 0 0'000			
587		I III IV	.55	- .13		- .022	- .152	58 23 26'718	4'9643476,1	92118'66	17'447
			.56	+ .15		- .043	+ .107	74 27 48'477	5'0179239,7	104213'50	19'737
			.55	+ .10		+ .065	+ .165	47 8 44'805	4'8992456,1	79294'97	15'018
			1'66				+ .120	180 0 0'000			
588		III IV VI	.59	+ .40		- .042	+ .358	52 4 8'728	4'9378451,4	86665'28	16'414
			.60	+ .15		- .010	+ .140	70 57 39'560	5'0164725,3	103865'79	19'672
			.59	+ .21		+ .052	+ .262	56 58 11'712	4'9643476,1	92118'66	17'447
			1'78				+ .760	183 0 0'000			
589		III VI VII	.61	- .53		- .072	- .602	39 31 21'108	4'8838097,1	76526'12	14'494
			.62	- .32		+ .136	- .184	80 44 20'146	5'0743939,9	118684'51	22'478
			.62	- .23		- .064	- .294	59 44 18'746	5'0164725,3	103865'79	19'672
			1'85				- 1'080	180 0 0'000			
590		VI VII VIII	.47	+ 1'18		- .013	+ 1'167	54 13 34'247	4'9026241,3	79914'23	15'135
			.47	+ .60		- .114	+ .486	74 47 35'486	4'9779467,5	95048'82	18'002
			.46	+ .56		+ .127	+ .687	50 58 50'267	4'8838097,1	76526'12	14'494
			1'40				+ 2'340	180 0 0'000			
591		VI VII IX	.35	+ .95		+ .057	+ 1'007	18 6 53'747	5'0599225,4	114794'88	21'741
			.35	+ .41		- .084	+ .326	149 55 21'046	5'2672538,9	185035'02	35'045
			.34	- .44		+ .027	- .413	11 57 45'207	4'8838097,1	76526'12	14'494
			1'04				+ .920	180 0 0'000			
59		VIII IX X	.95	+ .86	+ .038		+ .898	79 58 5'398	5'1578901,3	143843'45	27'243
			.95	+ .52	- .107		+ .413	43 28 51'843	5'0022422,2	100517'62	19'037
			.95	- .31	+ .069		- .241	56 33 2'759	5'0859423,3	121882'78	23'084
			2'85				+ 1'070	180 0 0'000			
146		IX X XI	.87	+ .92	- .072		+ .848	41 38 51'968	4'9823374,1	96014'62	18'185
			.88	- .23	+ .107		- .123	53 44 8'817	5'0663056,0	116494'56	22'063
			.88	+ .57	- .035		+ .535	84 36 59'215	5'1578901,3	143843'45	27'243
			2'63				+ 1'260	180 0 0'000			
592		VIII IX XI	1'11	+ 1'18		+ .121	+ 1'301	46 1 32'171	5'0663056,0	116494'56	22'063
			1'12	+ 1'44		- .179	+ 1'261	85 7 44'511	5'2076128,6	161292'02	30'548
			1'11	+ .71		+ .058	+ .768	48 50 43'318	5'0859423,3	121882'78	23'084
			3'34				+ 3'330	180 0 0'000			

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
145		X	.76	— .01	+ .046		+ .036	57 19 34.806	5°0233511,5	105523.98	19.986
		XI	.77	+ .12	— .004		+ .116	72 41 10.426	5°0780254,6	119681.06	22.667
		XII	.76	+ .19	— .042		+ .148	49 59 14.768	4°9823374,1	96014.62	18.185
			2.29			+ .300	180 0 0.000				
147		XI	.99	— .47	+ .026		— .444	69 0 33.246	5°1235133,0	132806.42	25.170
		XII	.99	— .17	— .032		— .202	63 8 42.778	5°1037746,6	126991.51	24.051
		XVI	.98	— .61	+ .006		— .604	47 50 43.976	5°0233511,5	105523.98	19.986
			2.96			— 1.250	180 0 0.000				
148		XII	.94	+ .18	— .007		+ .173	49 47 34.353	5°0269373,0	106398.95	20.151
		XVI	.94	+ .08	+ .034		— .046	57 40 12.594	5°0708537,9	117720.95	22.296
		XV	.94	+ .02	— .027		— .007	72 32 13.053	5°1235133,0	132806.42	25.170
			2.82			+ .120	180 0 0.000				
144		X	.72	— .14	+ .058		— .082	47 15 23.208	4°9590134,2	90994.13	17.234
		XII	.73	+ .25	— .041		+ .209	57 44 35.889	5°0202798,1	104780.34	19.845
		XIII	.73	— .36	— .017		— .377	75 0 0.813	5°0780254,6	119681.06	22.667
			2.18			— .250	180 0 0.000				
639		X	.46	+ .23		+ .043	+ .273	20 55 19.213	4°8477962,3	70436.25	13.340
		XIII	.47	+ .03		— .028	+ .002	126 59 25.742	5°1974133,5	157548.17	29.839
		XIV	.46	— .20		— .015	— .215	32 5 15.045	5°0202798,1	104780.34	19.845
			1.39			+ .060	180 0 0.000				
640		XIII	.40	+ .39		— .011	+ .379	51 59 24.269	4°8640773,4	73126.92	13.850
		XIV	.40	+ .08		— .047	+ .033	78 38 29.093	4°9590134,2	90994.13	17.234
		XII	.39	+ .15		+ .058	+ .208	49 22 6.638	4°8477962,3	70436.25	13.340
			1.19			+ .620	180 0 0.000				
641		XIV	.68	— .19		— .038	— .228	58 10 47.142	5°0708537,9	117720.95	22.296
		XII	.68	+ .03		+ .064	+ .094	89 57 41.084	5°1415847,1	138543.04	26.239
		XV	.67	— .41		— .026	— .436	31 51 31.774	4°8640773,4	73126.92	13.850
			2.03			— .570	180 0 0.000				
149		XV	.76	— .18	— .012		— .192	75 51 39.618	5°0901600,4	123072.22	23.309
		XVI	.75	— .03	+ .040		+ .010	47 10 27.590	4°9688758,9	93084.19	17.630
		XVII	.76	— .28	— .028		— .308	56 57 52.792	5°0269373,0	106398.95	20.151
			2.27			— .490	180 0 0.000				
150		XVI	.65	— .04	+ .032		— .008	37 55 30.172	4°8848733,8	76713.78	14.529
		XVII	.65	+ .20	— .044		+ .156	61 39 18.526	5°0407945,0	109848.59	20.805
		XIX	.66	+ .21	+ .012		+ .222	80 25 11.302	5°0901600,4	123072.22	23.309
			1.96			+ .370	180 0 0.000				
151		XIX	.57	— .15	+ .026		— .124	83 51 11.256	5°0593248,8	114637.01	21.712
		XVII	.56	— .14	— .034		— .174	54 26 18.126	4°9721813,9	93795.37	17.764
		XXI	.56	+ .05	+ .008		+ .058	41 42 30.618	4°8848733,8	76713.78	14.529
			1.69			— .240	180 0 0.000				
152		XVII	.82	— .05	— .009		— .059	46 11 38.091	4°9768666,9	94812.74	17.957
		XXI	.82	— .03	+ .040		+ .010	73 2 45.100	5°0992204,7	125666.77	23.801
		XX	.82	+ .10	— .031		+ .069	60 45 36.809	5°0593248,8	114637.01	21.712
			2.46			+ .020	180 0 0.000				

NORTH-WEST HIMALAYA SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-Circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
153	642	XV XVII XVIII	"	"	"	"	"	o' "			
			.50 + 1'00		-.034 + '966	38 53 47'436	4'8387584,2	68985'59	13'065		
			.51 + '47		+.059 + '529	83 11 17'349	5'0377805,6	109088'91	20'661		
			.50 + '13		-.025 + '105	57 54 55'215	4'9688758,9	93084'19	17'630		
				1'51		+ 1'600	180 0 0'000				
	643	XVII XVIII XX	.58 - '08		+.056 - '024	57 33 31'236	5'0255804,8	106067'04	20'088		
			.58 + '01		-.031 - '021	89 9 0'029	5'0992204,7	125666'77	23'801		
			.57 - '35		-.025 - '375	33 17 28'735	4'8387584,2	68985'59	13'065		
						1'73		- '420	180 0 0'000		
	153	XXI XX XXII	.58 - '35 + '053		- '297	62 15 13'343	4'9752201,6	94453'95	17'889		
			.57 - '43 - '082		- '512	55 4 33'558	4'9420354,2	87505'51	16'573		
			.58 - '25 + '029		- '221	62 40 13'099	4'9768666,9	94812'74	17'957		
						1'73		- 1'030	180 0 0'000		
	154	XX XXII XXIII	.82 + '09 - '034		+ '056	96 28 35'656	5'1849449,1	153089'33	28'994		
			.82 - '06 + '097		+ '037	45 42 47'447	5'0425495,3	110293'41	20'889		
			.81 - '45 - '063		- '513	37 48 36'897	4'9752201,6	94453'95	17'889		
						2'45		- '420	180 0 0'000		
	155	XXII XXIII XXIV	.54 + '47 + '055		+ '525	33 14 7'825	4'9799213,3	95481'96	18'084		
			.54 + '10 - '094		+ '006	28 15 26'196	4'9163332,5	82477'07	15'621		
			.55		+ '039	118 30 25'979	5'1849449,1	153089'33	28'994		
						1'63			180 0 0'000		
	156	XXIV XXIII XXV	1'12 - '40 + '050		- '350	87 54 11'740	5'2409364,2	174155'19	32'984		
			1'12 - '24 - '076		- '316	58 52 27'484	5'1737189,3	149182'86	28'254		
			1'12 - '22 + '026		- '194	33 13 20'776	4'9799213,3	95481'96	18'084		
					3'36		- '860	180 0 0'000			
644	XXI XX XXIV	.83 + '04		+ '111 + '151	43 39 11'291	5'0525414,4	112860'37	21'375			
		.83 - '02		-.187 - '207	100 54 10'613	5'2055982,5	160545'54	30'406			
		.82 - '15		+ '076 - '074	35 26 38'096	4'9768666,9	94812'74	17'957			
					2'48		- '130	180 0 0'000			
645	XX XXIV XXIII	.75 - '32		+ '071 - '249	50 38 58'411	4'9799213,3	95481'96	18'084			
		.76		+ '086	63 16 57'906	5'0425495,3	110293'41	20'889			
		.76 - '35		-.157 - '507	66 4 3'683	5'0525414,4	112860'37	21'375			
					2'27			180 0 0'000			
646	XXII XXIV XXV	.43 - '75		+ '079 - '671	17 4 15'389	5'1737189,3	149182'86	28'254			
		.43 - '28		-.089 - '369	153 35 20'181	5'3542012,9	226048'33	42'812			
		.43 - '09		+ '010 - '080	9 20 24'430	4'9163332,5	82477'07	15'621			
					1'29		- 1'120	180 0 0'000			
157	XXIII XXV XXVII	1'68 + 1'32 - '058		+ 1'262	37 3 54'772	5'0916379,3	123491'74	23'389			
		1'69 + '84 + '154		+ '994	84 43 24'884	5'3096754,6	204021'30	38'640			
		1'69 + 1'12 - '096		+ 1'024	58 12 40'344	5'2409364,2	174155'19	32'984			
					5'06		+ 3'280	180 0 0'000			
647	XXIII XXV XXVI	1'12 + '72		-.037 + '683	32 2 58'663	4'9666847,4	92615'73	17'541			
		1'12 + '28		+ '075 + '355	61 42 47'015	5'1866451,1	153689'83	29'108			
		1'12 - '14		-.038 - '178	86 14 14'322	5'2409364,2	174155'19	32'984			
					3'36		+ '860	180 0 0'000			

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles	
256	648	XXV	.35	+ .56		+ .078	+ .638	23 0 38.088	4.7215059,7	52663.05	9.974	
		XXVI	.36	+ .44		-.038	+ .402	113 33 36.912	5.0916379,3	123491.74	23.389	
		XXVII	.35	+ .62		-.040	+ .580	43 25 45.000	4.9666847,4	92615.73	17.541	
				1.06			+ 1.620	180 0 0.000				
		256	XXV	.64	- .95	+ .059		- .891	37 55 35.789	4.8839978,4	76559.28	14.500
	XXVII		.64	- .13	-.112		- .242	59 34 22.158	5.0310139,0	107402.38	20.341	
	XXIX		.65	+ .12	+ .053		+ .173	82 30 2.053	5.0916379,3	123491.74	23.389	
				1.93			- .960	180 0 0.000				
	255	255	XXVII	.79	- .00	-.084		- .084	81 43 16.816	5.1548201,7	142830.25	27.051
			XXIX	.79	+ .74	+ .197		+ .937	66 14 38.877	5.1209189,1	132104.90	25.020
			XXVIII	.78	- .15	-.113		- .263	32 2 4.307	4.8839978,4	76559.28	14.500
					2.36			+ .590	180 0 0.000			
675		XXV	.80	- 1.73		+ .163	- 1.567	20 1 51.403	5.1209189,1	132104.90	25.020	
		XXVII	.81	- .13		-.196	- .326	141 17 39.594	5.3823255,7	241171.26	45.676	
	XXVIII	.80	+ .55		+ .033	+ .583	18 40 29.003	5.0916379,3	123491.74	23.389		
			2.41			- 1.310	180 0 0.000					
257	257	XXIX	.76	- .17	-.005		- .175	59 23 9.375	5.0901777,2	123077.23	23.310	
		XXVIII	.76	- .32	-.088		- .408	33 29 26.582	4.8971509,3	78913.42	14.946	
		XXXI	.77	- .03	+ .093		+ .063	87 7 24.043	5.1548201,7	142830.25	27.051	
			2.29			- .520	180 0 0.000					
258	258	XXVIII	.99	- .00	-.110		- .110	84 16 12.980	5.1809421,4	151684.82	28.728	
		XXXI	.98	+ .27	+ .086		+ .356	41 53 31.836	5.0077188,5	101793.22	19.279	
		XXX	.98	+ .11	+ .024		+ .134	53 50 15.184	5.0901777,2	123077.23	23.310	
			2.95			+ .380	180 0 0.000					
676	676	XXIX	1.01	- .25		+ .101	- .149	25 20 11.501	5.0077188,5	101793.22	19.279	
		XXVIII	1.02	- .31		-.198	- .508	117 45 40.302	5.3232344,7	210491.44	39.866	
		XXX	1.01	+ .12		+ .097	+ .217	36 54 8.197	5.1548201,7	142830.25	27.051	
			3.04			- .440	180 0 0.000					
259	259	XXXI	1.34	- .38	-.333		- .713	25 31 45.227	5.1485179,4	140772.54	26.661	
		XXX	1.35	- .20	-.127		- .327	126 48 2.593	5.4175521,7	261548.48	49.536	
		XXXII	1.35	+ .15	+ .460		+ .610	27 40 12.180	5.1809421,4	151684.82	28.728	
			4.04			- .430	180 0 0.000					
677	677	XXXI	1.23	- .54		-.628	- 1.168	51 28 42.072	5.0950003,2	124451.55	23.570	
		XXX	1.23	- .26		+ .275	+ .015	56 2 54.025	5.1204076,3	131949.46	24.990	
		XXXIII	1.24	- .23		+ .353	+ .123	72 28 23.903	5.1809421,4	151684.82	28.728	
			3.70			- 1.030	180 0 0.000					
678	678	XXXI	1.19	- .16		-.295	- .455	25 56 55.545	5.1878714,7	154124.42	29.190	
		XXXIII	1.19	- .11		-.092	- .202	132 3 3.398	5.4175521,7	261548.48	49.536	
		XXXII	1.19	- .10		+ .387	+ .287	22 0 1.057	5.1204076,3	131949.46	24.990	
			3.57			- .370	180 0 0.000					
260	260	XXX	.79	+ .47	- .259		+ .211	36 28 14.011	4.9244505,4	84033.13	15.915	
		XXXII	.80	+ .51	+ .219		+ .729	58 48 34.349	5.0825595,6	120937.09	22.905	
		XXXIV	.80	+ .12	+ .040		+ .160	84 43 11.640	5.1485179,4	140772.54	26.661	
			2.39			+ 1.100	180 0 0.000					

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
261		XXXII	"	"	"	"	"	0' "			
		XXXIV	.50	- .10	- .020		- .120	72 52 41'640	4'9850423,5	96614'50	18'298
		XXXVII	.50	- .36	- .155		- .515	51 23 4'115	4'8983621,0	79133'82	14'987
			.50	- .13	+ .175		+ .045	56 4 14'245	4'9244505,4	84033'13	15'915
			1'50				- .590	180 0 0'000			
262		XXXIV	1'55	+ .03	- .221		- .191	82 4 43'829	5'3316131,5	214591'81	40'642
		XXXVII	1'55	+ .47	- .001		+ .469	71 26 18'159	5'3125768,1	205388'83	38'899
		XXXVI	1'54	+ .75	+ .222		+ .972	26 28 58'012	4'9850423,5	96614'50	18'298
			4'64				+ 1'250	180 0 0'000			
679		XXX	1'10	+ .04		- .446	- .406	54 54 44'094	5'0875784,4	122342'80	23'171
		XXXIV	1'11	- .30		+ .252	- .048	71 6 7'202	5'1506159,4	141454'21	26'791
		XXXV	1'10	+ .15		+ .194	+ .344	53 59 8'704	5'0825595,6	120937'09	22'905
			3'31				- .110	180 0 0'000			
680		XXXIV	1'87	- .39		+ .084	- .306	70 42 47'384	5'3040115,6	201377'80	38'140
		XXXV	1'87	+ .43		- .424	+ .006	74 17 48'866	5'3125768,1	205388'83	38'899
		XXXVI	1'86	+ .33		+ .340	+ .670	34 59 23'750	5'0875784,4	122342'80	23'171
			5'60				+ .370	180 0 0'000			
446		XXXVII	2'72	- .50	- .034		- .534	47 2 20'726	5'2391575,2	173443'29	32'849
		XXXVI	2'72	- .18	- .047		- .227	68 4 42'363	5'3421595,3	219866'73	41'641
		XXXVIII	2'72	- .17	+ .081		- .089	64 52 56'911	5'3316131,5	214591'81	40'642
			8'16				- .850	180 0 0'000			
447		XXXVI	2'55	+ .02	- .079		- .059	67 51 55'671	5'3228285,2	210294'79	39'829
		XXXVIII	2'54	+ .07	+ .023		+ .093	62 19 5'833	5'3032852,0	201041'25	38'076
		XXXIX	2'54	+ .32	+ .056		+ .376	49 48 58'496	5'2391575,2	173443'29	32'849
			7'63				+ .410	180 0 0'000			
448		XXXIX	2'70	- .34	- .102		- .442	47 51 42'318	5'2425644,8	174809'27	33'108
		XXXVIII (XIX)	2'71	- .23	+ .052		- .178	69 0 20'202	5'3426049,0	220092'34	41'684
			2'70	+ .10	+ .050		+ .150	63 7 57'480	5'3228285,2	210294'79	39'829
			8'11				- .470	180 0 0'000			
449		XXXVIII (XIX)	2'02	+ .02	- .052		- .032	55 24 19'118	5'2153750,6	164200'70	31'099
		(XVIII)	2'02	- .02	- .027		- .047	63 23 12'473	5'2512378,1	178335'50	33'776
			2'02	+ .28	+ .079		+ .359	61 12 28'409	5'2425644,8	174809'27	33'108
			6'06				+ .280	180 0 0'000			
785		XXXVII	2'75	+ .49		- .103	+ .387	58 11 45'277	5'3007227,6	199858'55	37'852
		XXXVIII	2'74	+ .26		- .053	+ .207	52 35 10'937	5'2713461,0	186786'77	35'376
		XL	2'75	+ .48		+ .156	+ .636	69 13 3'786	5'3421595,3	219866'73	41'641
			8'24				+ 1'230	180 0 0'000			
786		XXXVIII	2'32	- .22		- .051	- .271	55 47 51'949	5'2503739,7	177981'14	33'709
		XL	2'32	+ .09		- .116	- .026	55 57 57'544	5'2512378,1	178335'50	33'776
		(XVIII)	2'32	- .10		+ .167	+ .067	68 14 10'507	5'3007227,6	199858'55	37'852
			6'96				- .230	180 0 0'000			

NOTE.—(XVIII) and (XIX) appertain to base-line figures.

J. B. N. HENNESSEY.

## PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

### NORTH-WEST HIMALAYA SERIES.

The initial elements of this Series are those of the stations (X) and (XI) and are obtained from the Great Arc Meridional Series page 29—<sub>a</sub>, being as follows:—

		Lat. N.		Long. E. of Gh.		Azimuth
At (X)	30°	28' 36".91		78° 3' 23".14		71° 6' 9".23 of (XI)
„ (XI)	30	22 44 .86		77 43 41 .95		250 56 11 .01 of (X)
						Distance (X) to (XI) in Log. feet = 5.0388050,7

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
25	(X)	88 24 11.95	5.3178547,2		I	30 27 33.57	77 23 48.38	268 4 7.80
„	„	121 7 33.36	5.1885385,1	26	II	30 41 44.31	77 38 9.53	300 54 43.18
26	II	41 16 20.64	5.0578427,1		I			221 9 2.57
„	„	81 42 48.51	5.0613002,9		III	30 38 58.20	77 16 24.80	261 31 42.93
„	„	135 36 8.93	4.9376974,7	27	V	30 51 56.51	77 26 34.00	315 30 12.99
„	„	345 48 16.18	5.0745393,2		(XI)			165 51 5.08
„	(XI)	105 40 43.01	5.0353847,7		I			285 30 38.68
„	I	92 21 39.17	5.0179239,7		IV	30 28 14.55	77 3 58.41	272 11 35.84
„	„	150 45 6.44	4.8992456,1		III			330 41 20.94
27	V	34 5 58.78	4.9773044,9		III			214 0 47.23
„	„	93 23 40.32	5.1291824,9		VII	30 53 12.87	77 0 51.37	273 10 28.66
„	„	126 34 7.38	5.3026164,5	28	IX	31 11 36.55	76 55 37.73	306 18 10.50
„	III	45 9 9.98	4.9643476,1		IV			225 2 50.48
„	„	97 13 19.30	5.0164725,3		VI	30 41 5.96	76 56 44.62	277 3 17.34
„	„	136 44 41.02	5.0743939,9		VII			316 36 43.51

Note.—(X) and (XI) appertain to base-line figures.



Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
28	IV	154 5 10'32	4'9378451,4	70	VI			334 1 29'65
	IX	25 33 9'43	5'0859423,3		VIII	30 53 27'77	76 45 34'30	205 27 58'26
	"	69 2 2'22	5'1578901,3		X	31 3 4'54	76 29 53'44	248 48 44'03
	"	110 40 55'06	5'0663056,0		XI			290 30 3'28
"	346 13 42'55	5'0599225,4	VII				166 16 24'27	
"	"	358 11 28'10	5'2672538,9		VI			178 12 2'48
"	VII	16 21 2'87	4'8838097,1		VI			196 18 56'58
"	"	91 8 38'83	4'9026241,3		VIII			271 0 48'04
70	VI	142 5 21'86	4'9779467,5		VIII			321 59 38'77
	X	90 29 34'74	5'0202798,1		XIII	31 3 11'90	76 9 48'79	270 19 13'36
"	"	111 24 54'42	5'1974133,5	XIV	31 12 30'83	76 1 44'37	291 10 21'20	
"	"	137 44 58'76	5'0780254,6	XII	31 17 40'45	76 14 25'90	317 36 58'65	
"	"	195 4 34'33	4'9823374,1	71	XI	31 18 22'07	76 34 41'33	15 7 3'38
"	"	305 21 47'74	5'0022422,2		VIII			125 29 51'91
71	XI	87 48 14'57	5'0233511,5	XII			267 37 43'12	
"	"	156 48 48'81	5'1037746,6	72	XVI	31 37 37'06	76 25 2'98	336 43 46'90
"	"	339 20 47'71	5'2076128,6		VIII			159 26 24'98
"	XIII	143 19 47'15	4'8477962,3	XIV			323 15 36'70	
"	"	195 19 11'82	4'9590134,2	XII			15 21 35'27	
72	XVI	24 34 31'86	5'1235133,0	XII			204 28 59'35	
"	"	82 14 45'39	5'0269373,0	XV	31 35 13'36	76 4 44'00	262 4 6'54	
"	"	129 25 13'73	5'0901600,4	XVII	31 50 29'19	76 6 40'69	309 15 33'95	
"	"	167 20 44'56	5'0407945,0	73	XIX	31 55 17'71	76 20 23'74	347 18 17'51
"	XII	64 43 42'29	4'8640773,4		XIV			244 37 7'21
"	"	154 41 24'06	5'0708537,9	XV			334 36 20'53	
"	XIV	186 26 19'39	5'1415847,1	XV			6 27 52'98	
"	XV	147 18 38'23	5'0377805,6	XVIII	31 50 21'49	75 53 20'94	327 12 39'16	
"	"	186 12 26'16	4'9688758,9	XVII			6 13 27'50	
73	XIX	67 43 29'48	4'8848733,8	XVII			247 36 14'78	
"	"	151 34 41'30	4'9721813,9	74	XXI	32 8 53'77	76 11 44'42	331 30 5'84
"	XXI	13 12 37'02	5'0593248,8		XVII			193 9 56'09
"	"	86 15 22'94	4'9768666,9	XX	32 7 51'18	75 53 24'06	266 5 37'56	
"	"	129 54 35'06	5'2055982,5	XXIV			309 41 47'43	
"	"	148 30 36'86	4'9420354,2	75	XXII	32 21 11'89	76 2 51'52	328 25 52'49
"	XVII	89 24 45'36	4'8387584,2		XVIII			269 17 43'44

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
75	XVII	146 58 17.18	5.0992204,7	76	XX			326 51 15.19
	XVIII	180 8 42.84	5.0255804,8		XX			0 8 44.50
	XXII	31 6 6.17	4.9752201,6		XX			211 1 3.43
"	"	76 48 54.44	5.1849449,1		XXIII	32 15 23.02	75 33 55.76	256 33 26.70
"	"	110 3 2.80	4.9163332,5		XXIV	32 25 50.82	75 47 47.45	289 54 58.48
76	"	127 7 18.62	5.3542012,9	77	XXV			306 48 23.61
	XXIV	48 25 25.01	4.9799213,3		XXIII			228 17 59.96
	"	136 19 37.87	5.1737189,3		XXV	32 43 36.98	75 27 41.42	316 8 48.47
"	"	345 8 26.34	5.0525414,4		XX			165 11 26.12
	XX	114 32 26.96	5.0425495,3		XXIII			294 22 4.41
77	XXV	51 4 58.50	4.9666847,4	125	XXVI	32 34 0.47	75 13 39.30	230 57 24.21
"	"	74 5 36.94	5.0916379,3		XXVII	32 37 59.94	75 4 32.48	253 53 6.98
"	"	94 7 29.14	5.3823255,7		XXVIII	32 46 19.85	74 40 43.85	273 42 4.90
"	"	112 1 13.36	5.0310139,0	126	XXIX			291 50 41.44
"	"	349 22 10.36	5.2409364,2		XXIII			169 25 31.36
125	XXVII	112 35 26.58	5.1209189,1	126	XXVIII			292 22 34.71
"	"	194 18 44.18	4.8839978,4		XXIX	32 50 13.95	75 8 14.32	14 20 44.15
"	"	297 18 52.33	4.7215059,7		XXVI			117 23 46.93
"	"	312 5 49.01	5.3096754,6		XXIII			132 21 34.91
	XXIII	137 22 31.58	5.1866451,1		XXVI			317 11 39.65
126	XXIX	80 35 23.81	5.1548201,7	127	XXVIII			260 20 29.62
"	"	105 55 36.32	5.3232344,7		XXX	32 59 39.22	74 28 37.53	285 34 4.75
"	"	139 58 33.95	4.8971509,3		XXXI	33 0 11.51	74 58 18.34	319 53 10.05
127	XXXI	47 0 34.86	5.0901777,2		XXVIII			226 51 2.28
"	"	88 54 7.68	5.1809421,4		XXX			268 37 57.79
"	"	114 25 54.24	5.4175521,7	128	XXXII	33 17 53.15	74 11 32.49	294 0 19.86
"	"	140 22 50.98	5.1204076,3		XXXIII	33 16 56.12	74 41 47.09	320 13 49.03
	XXVIII	142 34 48.31	5.0077188,5		XXX			322 28 13.96
128	XXXII	20 29 8.54	4.9244505,4	129	XXXIV	33 4 54.12	74 5 46.82	200 25 59.31
"	"	93 1 50.68	4.8983621,0		XXXVII	33 18 33.58	73 56 1.25	272 53 19.36
"	"	272 0 17.62	5.1878714,7		XXXIII			
"	"	321 40 33.39	5.1485179,4		XXX			141 49 53.85
	XXX	50 26 53.85	5.1506159,4		XXXV	32 44 46.11	74 7 20.37	230 15 20.59
"	"	105 21 39.05	5.0825595,6		XXXIV			285 9 11.75
"	"	212 35 2.54	5.0950003,2		XXXIII			32 42 14.18

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
129	XXXVII	40 23 53.81	5.3316131,5	221	XXXVI	32 51 33.56	73 28 50.66	220 9 3.70
"	"	87 26 17.26	5.3421595,3	222	XXXVIII			267 2 36.80
"	"	145 38 5.29	5.2713461,0		XL	33 43 57.35	73 35 12.71	325 26 35.78
"	"	328 57 34.10	4.9850423,5		XXXIV			149 2 54.70
221	XXXVI	84 12 20.40	5.3032852,0		XXXIX	32 48 6.62	72 49 47.08	263 51 9.81
"	"	152 4 18.62	5.2391575,2	222	XXXVIII	33 16 48.85	73 12 53.68	331 55 36.43
"	"	246 38 3.26	5.3125768,1		XXXIV			66 58 9.32
"	"	281 37 28.87	5.3040115,6		XXXV			101 58 20.15
"	XXXIV	356 15 20.07	5.0875784,4		XXXV			176 16 10.89
222	XXXVIII	34 14 44.81	5.3228285,2		XXXIX			214 2 8.77
"	"	103 15 7.72	5.2425644,8	272	(XIX)	33 23 20.85	72 39 26.68	282 56 44.81
"	"	158 39 28.86	5.2512378,1		(XVIII)	33 44 11.66	73 0 5.08	338 32 24.54
"	"	214 27 23.13	5.3007227,6		XL			34 39 42.32
"	XL	90 37 42.18	5.2503739,7		(XVIII)			270 18 11.72
272	(XIX)	219 33 30.31	5.2153750,6		(XVIII)			39 44 54.97
"	"	346 4 44.99	5.3426049,0		XXXIX			166 10 23.75

NOTE.—(XVIII) and (XIX) appertain to base-line figures.

J. B. N. HENNESSEY.

**PRINCIPAL TRIANGULATION. DIFFERENCES OF HEIGHT.**

**NORTH-WEST HIMALAYA SERIES.**

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1837	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
May 29	<i>h</i> 4 <i>m</i> 53	(X)	D 2 22 55.3	12	+		2.43	5.39	2.96	- 5.6				
„ 29	4 53	(XI)	E 2 6 56.5	12	1545	1080	4.48	4.77	0.29	+ 0.6	64	.059	2 14 53.4	-4293.7
1848														
Jan. 9	2 53	(XI)	D 0 38 28.4	6			1.46	5.38	3.92	- 7.5				
„ 17,20	2 36	I	E 0 22 50.3	12	653	1071	2.28	5.43	3.15	+ 6.0	73	.068	0 30 38.6	- 967.2
„ 9	3 9	(XI)	E 2 26 10.1	4			*0.28	5.38	5.66	+ 9.8				
April 20	2 40	II	D 2 43 35.9	4	653	1172	1.83	5.41	3.58	- 6.2	71	.061	2 34 54.8	+5355.1
May 6,19	3 4	(X)	E 0 12 15.2	8			1.67	5.40	3.73	+ 5.0				
April 20	2 49	II	D 0 34 49.7	4	1545	1524	1.71	5.41	3.70	- 4.9	90	.059	0 23 32.5	+1057.5
Jan. 17,20	2 57	I	E 3 1 35.9	8			*0.08	5.43	5.51	+ 9.9				
April 20	2 34	II	D 3 18 25.5	4	451	1128	1.54	5.41	3.87	- 7.0	68	.060	3 10 2.2	+6323.5
Jan. 20	3 7	I	E 1 57 55.2	4			1.67	5.43	3.76	+ 9.8				
Mar. 26	3 48	III	D 2 9 44.3	4	451	783	1.54	5.40	3.86	-10.0	47	.060	2 3 49.7	+2857.9

NOTE.—(X) and (XI) appertain to base-line figures. \* These heights are to be combined with negative signs, because the pillar at II had a permanent addition made to it of 2 feet by a subsequent observer.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1848	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference	Angle in seconds				
April 20	h 2 m 57	II	D 1 51 58.7	4	+		1.76	5.41	3.65	- 6.5				
Mar. 27	2 18	III	E 1 34 37.2	4	1766	1137	0.54	5.40	4.86	+ 8.7	55	.048	1 43 19.1	-3463.1
Jan. 17, 20	2 49	I	D 0 44 59.1	8			1.79	5.43	3.64	- 7.2				
" 27	2 43	IV	E 0 29 49.8	6	451	1029	1.96	5.41	3.45	+ 6.8	67	.065	0 37 24.3	-1134.0
Mar. 27	2 51	III	D 2 35 26.8	4			1.78	5.40	3.62	- 8.1				
Jan. 27	2 54	IV	E 2 22 19.9	4	1046	910	1.58	5.41	3.83	+ 8.6	70	.077	2 28 53.6	-3992.9
" 27	2 42	IV	E 0 14 45.5	4			1.33	5.41	4.08	+ 9.7				
Feb. 8, 13	3 1	VI	D 0 27 45.3	8	216	856	2.13	5.38	3.15	- 7.5	47	.055	0 21 16.5	+ 536.4
Mar. 27	2 35	III	D 2 1 52.1	4			1.83	5.40	3.57	- 7.1				
Feb. 10, 13	2 45	VI	E 1 46 39.8	8	1046	1026	1.54	5.38	3.84	+ 7.6	64	.062	1 54 16.2	-3454.3
Mar. 26	3 39	III	E 2 42 22.2	4			*0.18	5.40	5.58	+ 12.1				
April 7	2 7	V	D 2 56 36.8	4	1046	937	1.63	5.38	3.75	- 8.1	51	.054	2 49 31.5	+4685.6
" 20	3 13	II	E 0 41 48.9	4			1.54	5.41	3.87	+ 9.2				
" 7	2 36	V	D 0 55 22.2	8	1766	855	1.52	5.38	3.86	- 9.2	30	.035	0 48 35.6	+1225.2
Mar. 26	3 31	III	E 0 28 29.5	4			1.33	5.40	4.07	+ 7.1				
" 18	2 28	VII	D 0 46 17.2	4	1046	1172	1.58	5.41	3.83	- 6.7	59	.050	0 37 23.6	+1291.3
April 7	1 58	V	D 1 36 27.2	4			1.76	5.38	3.62	- 5.5				
Mar. 18	3 13	VII	E 1 16 39.2	4	2020	1329	*0.63	5.41	6.04	+ 9.2	78	.059	1 26 35.1	-3393.2
Feb. 13	3 4	VI	E 3 27 6.7	4			1.38	5.38	4.00	+ 10.8				
Mar. 18	2 38	VII	D 3 38 30.7	4	328	756	1.67	5.41	3.74	- 10.1	46	.061	3 32 49.1	+4744.4
Feb. 9, 13	3 12	VI	D 0 7 14.4	8			2.21	5.38	3.17	- 6.9				
" 16, 20	2 56	VIII	D 0 7 4.0	8	328	939	1.50	5.43	3.93	- 8.5	48	.051	0 0 6.0	- 2.8
Mar. 18	2 52	VII	D 3 29 48.5	4			1.75	5.41	3.66	- 9.4				
Feb. 20	3 8	VIII	E 3 18 13.6	4	1314	789	1.38	5.43	4.05	+ 10.5	57	.072	3 24 1.6	-4749.3
Mar. 18	3 1	VII	E 0 5 28.5	4			1.33	5.41	4.08	+ 7.3				
" 8	2 39	IX	D 0 22 32.1	4	1314	1134	1.33	5.39	4.06	- 7.3	63	.056	0 14 0.3	+ 467.8

\* These heights are to be combined with negative signs, because the pillar at V had a permanent addition made to it of 2 feet by a subsequent observer.

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet
1848	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference	Angle in seconds				
April 8	h 3 m 29	V	D 1 4 58.5	6	+									
Mar. 9	3 7	IX	E 0 35 18.5	4	2020	1982	*0.63	5.39	6.02	+ 6.2	106	.053	0 50 10.2	-2930.8
Feb. 17	3 18	VIII	E 2 18 19.8	4			1.33	5.43	4.10	+ 6.9				
Mar. 8	2 56	IX	D 2 35 58.1	4	327	1203	1.79	5.39	3.60	- 6.1	79	.066	2 27 9.4	+5221.5
Feb. 13	3 26	VI	E 1 23 22.6	4			3.00	5.38	2.38	+ 2.7				
Mar. 9	2 55	IX	D 1 50 19.4	4	328	1827	1.33	5.39	4.06	- 4.5	109	.060	1 36 50.1	+5214.5
Feb. 17, 20	3 9	VIII	D 0 7 9.9	8			1.74	5.43	3.69	- 7.6				
" 26	2 52	X	D 0 7 30.6	4	327	992	1.69	5.41	3.72	- 7.6	63	.064	0 0 10.4	+ 5.0
Mar. 9	2 41	IX	D 2 14 49.4	4			1.83	5.39	3.56	- 5.1				
Feb. 26	2 40	X	E 1 54 24.4	4	1412	1420	1.33	5.41	4.08	+ 5.8	103	.073	2 4 37.3	-5217.8
" 20	2 39	VIII	E 0 37 46.0	4			1.54	5.43	3.89	+ 5.0				
Mar. 1	2 59	XI	D 1 1 13.8	4	327	1593	1.79	5.41	3.62	- 4.6	97	.061	0 49 30.1	+2323.0
" 8	3 19	IX	D 1 33 50.4	4			1.54	5.39	3.85	- 6.8				
" 1	3 10	XI	E 1 17 1.7	4	1412	1150	1.33	5.41	4.08	+ 7.2	78	.068	1 25 26.3	-2896.5
Feb. 26	2 32	X	E 1 16 6.5	4			1.21	5.41	4.20	+ 9.0				
Mar. 1	2 50	XI	D 1 30 3.3	4	327	948	1.83	5.41	3.58	- 7.7	64	.068	1 23 5.6	+2321.5
1849														
Feb. 17	3 6	X	E 0 1 30.7	4			1.78	5.40	3.62	+ 6.2				
Mar. 4	2 7	XII	D 0 19 5.6	10	327	1182	1.12	5.40	4.28	- 7.4	70	.058	0 10 17.6	+ 358.4
Feb. 7, 8	2 46	XI	D 1 11 20.4	8			1.78	5.36	3.58	- 7.0				
Mar. 3, 4	2 10	XII	E 0 56 10.7	10	810	1042	1.12	5.40	4.28	+ 8.4	74	.071	1 3 46.3	-1957.9
(1)	2 48	X	D 0 28 37.0	12			3.44	5.33	1.89	- 3.7				
(2)	2 43	XIII	E 0 13 39.4	22	327	1035	3.45	5.33	1.88	+ 3.7	72	.070	0 21 8.2	- 644.3
(3)	3 1	XII	D 0 44 30.7	16			4.12	5.33	1.21	- 2.8				
(4)	2 53	XIII	E 0 31 28.4	18	402	898	4.08	5.33	1.25	+ 2.9	61	.068	0 37 59.6	-1005.8
(5)	3 0	XIII	D 0 7 33.6	16			3.20	5.33	2.13	- 6.2				
(6)	2 54	XIV	D 0 3 17.6	18	193	695	3.37	5.33	1.96	- 5.8	28	.040	0 2 7.8	- 43.7

NOTE.—This height is to be combined with a negative sign, because the pillar at V had a permanent addition made to it of 2 feet by a subsequent observer.  
 (1) The mean of observations taken on 17 February 1849 and 12, 13 February 1853. (2) The mean of observations taken on 8, 9 March 1849 and 16 to 18 February 1853.  
 (3) Ditto ditto 4 March 1849 and 1 to 7 ditto. (4) Ditto ditto 9 ditto ditto.  
 (5) Ditto ditto 9 ditto and 16 to 18 ditto. (6) Ditto ditto 15 ditto and 27 to 29 January 1853.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log-distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn in feet
1853	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
	<i>h m</i>		<i>o ' "</i>		<i>+</i>							<i>o ' "</i>		
Feb. 12,13	2 16	X	D o 26 12'0	10			5'30	5'25	0'05	+ 0.1				
Jr. 27,28,29	2 17	XIV	E o 3 48'5	12	327	1556	5'40	5'25	0'15	- 0.2	106	068	o 15 o'2	- 687.6
(1)	3 20	XII	D o 54 29'5	20			3'54	5'33	1'79	- 5.1				
(2)	2 42	XIV	E o 44 8'8	20	402	722	4'08	5'33	1'25	+ 3.6	55	076	o 49 18'4	- 1049.0
1849														
Mar. 15	2 44	XIV	E o 14 15'1	4			1'20	5'40	4'20	+ 6.3				
" 19	3 21	XV	D o 34 26'8	6	184	1368	1'30	5'40	4'10	- 6.1	84	061	o 24 21'1	+ 981.4
" 4	2 40	XII	D o 10 35'8	6			1'30	5'40	4'10	- 7.2				
" 26	4 29	XV	D o 6 42'4	6	402	1162	2'90	5'40	2'50	- 4.4	68	059	o 1 55'3	- 65.8
" 2,4	3 9	XII	E o 38 53'9	8			1'10	5'40	4'30	+ 6.7				
April 9	3 51	XVI	D o 58 5'1	4	402	1312	2'66	5'40	2'74	- 4.3	86	066	o 48 30'7	+ 1875.8
Feb. 7,8	2 58	XI	D o 11 29'9	8			1'25	5'36	4'11	- 6.7				
April 8	4 0	XVI	D o 7 1'6	4	810	1254	1'12	5'40	4'28	- 7.0	78	062	o 2 14'3	- 82.7
Mar. 24	3 3	XV	E o 54 56'4	6			1'20	5'40	4'20	+ 8.1				
April 9	3 10	XVI	D 1 10 27'0	6	389	1050	1'25	5'40	4'15	- 8.0	68	065	1 2 41'8	+ 1940.9
Mar. 24	2 40	XV	E o 47 14'9	4			1'42	5'40	3'98	+ 8.8				
May 11	3 50	XVII	D 1 1 13'7	4	389	919	1'29	5'40	4'11	- 9.1	49	053	o 54 14'2	+ 1468.8
April 8,9	3 35	XVI	D o 22 7'7	8			1'52	5'40	3'88	- 6.5				
May 11	4 46	XVII	E o 4 5'6	4	792	1215	1'57	5'40	3'83	+ 6.4	73	060	o 13 6'6	- 469.5
1850														
Jr. 17,18	1 49	XV	E o 2 4'2	10			1'32	5'33	4'01	+ 7.6				
" 5,7	2 50	XVIII	D o 17 45'8	6	389	1077	1'30	5'33	4'03	- 7.6	75	070	o 9 55'0	+ 314.7
" 23	12 21	XVII	D 1 2 34'3	4			1'32	5'33	4'01	- 12.0				
" 7	2 15	XVIII	E o 52 19'1	6	695	681	1'40	5'33	3'93	+ 11.7	45	066	o 57 26'6	- 1153.0
" 5,7	2 49	XVIII	D o 11 23'5	8			1'48	5'33	3'85	- 7.5				
Feb. 4	12 44	XX	D o 3 47'2	4	454	1047	1'40	5'33	3'93	- 7.6	76	073	o 3 48'2	- 117.4
Jan. 23	12 30	XVII	D o 43 42'2	4			1'50	5'33	3'83	- 6.3				
Feb. 4	12 34	XX	E o 25 47'1	4	695	1241	1'30	5'33	4'03	+ 6.6	89	072	o 34 44'8	- 1270.4

(1) The mean of observations taken on 3 March 1849, and 1 to 7 February 1853.

(2) The mean of observations taken on 11, 15 March 1849 and 27 to 29 January 1853.

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1849	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
May. 11	h 3 m 34	XVII	E 0 11 29.4	4	+		2.26	5.40	3.14	+ 8.4				
April 21	2 28	XIX	D 0 22 37.4	4	695	757	1.36	5.44	4.08	- 11.0	54	.071	0 17 2.1	+ 380.2
" 9	3 38	XVI	D 0 10 53.5	4			1.42	5.40	3.98	- 7.5				
" 18	5 2	XIX	D 0 5 3.3	6	792	1085	3.24	5.44	2.20	- 4.1	70	.065	0 2 53.4	- 92.4
May 11	3 41	XVII	D 0 21 12.5	4			1.28	5.40	4.12	- 7.4				
April 26	2 55	XXI	E 0 4 40.5	4	695	1132	1.36	5.40	4.04	+ 7.3	77	.068	0 12 56.5	- 431.6
" 18,21	3 3	XIX	D 0 36 37.4	10			1.27	5.44	4.17	- 9.2				
" 26	2 35	XXI	E 0 22 49.6	8	774	926	2.75	5.40	2.65	+ 5.8	57	.062	0 29 41.8	- 810.4
1850														
Feb. 4	12 56	XX	E 0 23 45.9	4			1.51	5.33	3.82	+ 8.3				
" 13	12 8	XXI	D 0 37 21.7	8	430	936	1.40	5.33	3.93	- 8.5	69	.074	0 30 33.7	+ 843.0
" 4	12 24	XX	E 0 13 16.3	4			1.40	5.33	3.93	+ 7.2				
Mar. 5	11 51	XXIV	D 0 29 36.5	6	430	1114	1.40	5.33	3.93	- 7.2	74	.066	0 21 26.4	+ 703.9
Feb. 12	12 14	XXI	D 0 14 35.9	4			1.40	5.33	3.93	- 5.0				
Mar. 5	11 39	XXIV	D 0 8 36.6	4	605	1585	1.30	5.33	4.03	- 5.2	101	.064	0 2 59.7	- 139.9
Feb. 4	1 7	XX	E 1 48 53.2	4			1.48	5.33	3.85	+ 8.4				
" 24	11 53	XXII	D 2 2 12.8	4	430	932	1.40	5.33	3.93	- 8.6	75	.080	1 55 32.9	+ 3176.5
" 13	11 53	XXI	E 1 25 14.2	4			1.65	5.33	3.68	+ 8.7				
" 24	11 28	XXII	D 1 38 11.7	6	605	864	1.30	5.33	4.03	- 9.5	52	.060	1 31 42.6	+ 2335.4
Mar. 5	11 24	XXIV	E 1 37 7.5	6			1.60	5.33	3.73	+ 9.3				
Feb. 24	12 0	XXII	D 1 49 6.1	4	576	814	1.40	5.33	3.93	- 9.8	57	.070	1 43 6.6	+ 2474.9
" 24	11 44	XXII	D 1 47 9.4	4			1.32	5.33	4.01	- 5.4				
Mar. 12	4 49	XXIII	E 1 25 41.1	4	1091	1511	1.60	5.33	3.73	+ 5.0	117	.077	1 36 25.1	- 4295.4
" 4	10 50	XXIV	D 1 12 28.9	4			1.32	5.33	4.01	- 8.7				
" 12	5 7	XXIII	E 0 58 50.1	4	576	943	1.30	5.33	4.03	+ 8.7	71	.075	1 5 39.5	- 1824.0
Feb. 3,4	12 17	XX	D 0 42 49.1	6			1.32	5.33	4.01	- 7.5				
Mar. 12	4 58	XXIII	E 0 26 58.4	4	430	1089	1.40	5.33	3.93	+ 7.3	77	.071	0 34 53.7	- 1119.6



Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1850	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Mar. 12, 13	h m 5 28	XXIII	E 1 51 36.6	8	+		1.40	5.33	3.93	+ 4.7				
April 16		XXV	D 2 16 30.9	4	197	1719	1.40	5.33	3.93	- 4.7	117	.068	2 4 3.8	+6288.9
Mar. 4	10 31	XXIV	E 1 32 5.1	6			1.40	5.33	3.93	+ 5.4				
April 16		XXV	D 1 53 53.2	4	576	1473	1.30	5.33	4.03	- 5.6	88	.060	1 42 59.1	+4471.4
Mar. 29	5 27	XXIII	E 0 3 18.2	4			1.20	5.33	4.13	+ 4.2				
April 24		XXVII	D 0 32 58.2	4	197	2014	1.40	5.33	3.93	- 4.0	121	.060	0 18 8.3	+1076.5
(1)		XXV	D 2 33 26.4	8			1.32	5.23	3.91	- 6.6				
(2)		XXVII	E 2 16 1.9	8	1505	1219	1.28	5.23	3.95	+ 6.6	94	.077	2 24 44.2	-5203.5
Mar. 13	5 25	XXIII	E 0 17 48.4	4			1.48	5.33	3.85	+ 5.2				
April 8		XXVI	D 0 40 3.5	4	197	1517	1.40	5.33	3.93	- 5.3	96	.063	0 28 55.9	+1293.6
" 16		XXV	D 3 12 1.0	4			1.52	5.33	3.81	- 8.5				
" 8		XXVI	E 2 58 40.6	4	1505	914	1.40	5.33	3.93	+ 8.7	65	.071	3 5.20.9	-4999.4
" 24		XXVII	E 0 9 40.9	4			1.30	5.33	4.03	+15.8				
" 8		XXVI	D 0 17 47.9	4	423	520	1.20	5.33	4.13	-16.2	33	.063	0 13 44.2	+ 210.5
1851														
Jan. 26, 29	3 31	XXVII	D 0 39 7.2	8			1.40	5.13	3.73	- 5.8				
Mar. 3, 4	3 27	XXVIII	E 0 20 8.3	12	423	1304	1.44	5.13	3.69	+ 5.8	88	.067	0 29 37.8	-1138.7
Feb. 22	2 38	XXV	D 1 46 53.2	4			1.40	5.13	3.73	- 3.2				
Mar. 3, 4	2 37	XXVIII	E 1 13 21.6	8	1505	2381	1.35	5.13	3.78	+ 3.2	188	.079	1 30 7.4	-6325.2*
Jan. 29	2 59	XXVII	E 1 6 56.9	4			1.27	5.13	3.86	+10.4				
Feb. 7, 8	3 7	XXIX	D 1 18 4.6	8	423	756	1.44	5.13	3.69	- 9.9	54	.071	1 12 31.0	+1615.4
Feb. 22	2 47	XXV	D 2 2 28.4	4			1.27	5.13	3.86	- 7.4				
" 8, 9	4 58	XXIX	E 1 47 20.5	8	1505	1060	1.32	5.13	3.81	+ 7.3	83	.078	1 54 54.4	-3592.2
Mar. 3, 4	2 47	XXVIII	E 0 56 9.7	8			1.27	5.13	3.86	+ 5.6				
Feb. 7, 8	2 48	XXIX	D 1 16 23.6	8	186	1410	1.40	5.13	3.73	- 5.4	104	.074	1 6 16.8	+2754.3
Mar. 3, 4	2 58	XXVIII	E 1 29 49.0	8			1.46	5.13	3.67	+ 7.4				
" 22, 24	2 58	XXX	D 1 44 37.8	8	186	1005	1.44	5.13	3.59	- 7.5	66	.066	1 37 13.4	+2879.9

(1) The mean of observations taken on 16 April 1850, and 2 February 1851. (2) The mean of observations taken on 24 April 1850, and 29 January 1851. \* Rejected.

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1851	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
Feb. 7,8	h 3 m 10	XXIX	0 12 51.0	8	+		1.46	5.13	3.67	- 3.6				
March 22, } 23,24 }	3 10	XXX	D 0 17 4.7	12	759	2078	1.27	5.13	3.86	- 3.8	145	.070	0 2 6.8	+ 129.4
„ 3,4	2 53	XXVIII	E 1 14 18.8	8			1.33	5.13	3.80	+ 6.4				
„ 13,14,15	2 53	XXXI	D 1 31 42.9	12	186	1215	1.44	5.13	3.69	- 6.2	92	.076	1 23 1.0	+ 2973.0
Feb. 7,8	3 4	XXIX	E 0 4 0.2	8			1.33	5.13	3.80	+ 9.9				
March 13, } 14,15 }	3 3	XXXI	D 0 15 34.5	12	759	779	1.27	5.13	3.86	- 10.1	52	.067	0 9 47.3	+ 224.7
„ 22,24	2 49	XXX	D 0 8 34.7	8			1.30	5.13	3.83	- 5.2				
„ 13,14,15	2 52	XXXI	D 0 12 55.1	12	785	1497	1.46	5.13	3.67	- 5.0	109	.073	0 2 10.3	+ 95.8
„ 22,23,24	2 34	XXX	E 0 30 12.6	12			1.40	5.13	3.73	+ 5.5				
Ap. 9,10	2 40	XXXII	D 0 50 47.5	8	785	1390	1.44	5.10	3.66	- 5.4	83	.060	0 40 30.1	+ 1658.9
Mar. 15,16	3 11	XXXI	E 0 1 48.4	8	805	2582	1.46	5.13	3.67	+ 2.9	174	.067	0 20 27.9	+ 1557.4
April 10	8 18	XXXII	D 0 39 7.4	4			1.30	5.10	3.80	- 3.0				
Mar. 22	2 43	XXX	E 1 41 56.1	4	785	1229	1.33	5.13	3.80	+ 6.3	82	.067	1 50 54.7	+ 4017.6
April 1	2 41	XXXIII	D 1 59 53.1	4			1.44	5.13	3.69	- 6.1				
March 13, } 15,16 }	2 44	XXXI	E 1 32 21.8	12	805	1303	1.33	5.13	3.80	+ 5.9	83	.064	1 41 56.1	+ 3914.7
April 1	2 46	XXXIII	D 1 51 30.5	4			1.30	5.13	3.83	- 6.0				
„ 9	2 58	XXXII	E 0 41 17.2	4	1129	1521	1.29	5.10	3.81	+ 5.1	86	.057	0 52 36.5	+ 2359.5
„ 1	2 51	XXXIII	D 1 3 55.7	4			1.40	5.13	3.73	- 5.0				
March 22, } 23,24 }	2 39	XXX	D 0 15 19.5	12	785	1194	1.46	5.13	3.67	- 6.3	70	.059	0 6 26.4	- 226.6
April 13, } 14,15 }	2 39	XXXIV	D 0 2 26.7	12			1.44	5.10	3.66	- 6.2				
April 9,10	2 43	XXXII	D 1 23 13.5	8	1129	830	1.46	5.10	3.64	- 8.9	52	.063	1 17 1.8	- 1883.6
„ 13,14,15	2 44	XXXIV	E 1 10 49.9	12			1.40	5.10	3.70	+ 9.1				
Mar. 22,23,24	3 5	XXX	D 1 19 1.4	12	785	1396	1.38	5.13	3.75	- 5.5	94	.067	1 8 52.0	- 2834.4
Ap. 28,29	3 10	XXXV	E 0 58 42.7	8			1.40	5.10	3.70	+ 5.4				
„ 13,14,15	2 56	XXXIV	D 1 22 7.9	12	738	1208	1.38	5.10	3.72	- 6.3	76	.063	1 13 13.8	- 2606.8
„ 28,29	2 54	XXXV	E 1 4 19.7	8			1.40	5.10	3.70	+ 6.2				

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1851	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
	<i>h m</i>		<i>o ' "</i>		<i>+</i>							<i>o ' "</i>		
Nov. 5,6	3 4	XXXV	E o 24 7'1	8			1'40	5'04	3'64	+ 3'7				
,, 12,13,14	3 8	XXXVI	D o 52 55'5	12	196	1988	1'33	5'35	4'02	- 4'1	134	.067	o 38 31'1	+ 2256'6
Apl. 14,15	3 3	XXXIV	D o 20 30'0	8			1'46	5'10	3'64	- 3'7				
Nov. 12	2 52	XXXVI	D o 8 48'1	4	738	2028	1'35	5'35	4'00	- 4'0	139	.068	o 5 51'1	- 349'7
Apl 13,14,15	2 52	XXXIV	E o 22 15'0	12			1'46	5'10	3'64	+ 7'8				
,, 22	2 38	XXXVII	D o 36 35'1	8	738	954	1'35	5'10	3'75	- 8'0	55	.058	o 29 25'0	+ 826'9
,, 9,10	2 55	XXXII	D o 51 47'0	8			1'29	5'10	3'81	- 9'9				
,, 22	2 33	XXXVII	E o 40 4'7	8	1129	781	1'40	5'10	3'70	+ 9'6	49	.063	o 45 55'7	- 1057'5
Nov. 12,13	2 43	XXXVI	E o 3 33'0	8			1'30	5'35	4'05	+ 3'9				
April 22	2 29	XXXVII	D o 34 3'0	8	665	2118	1'46	5'10	3'64	- 3'5	148	.070	o 18 48'2	+ 1174'0
(1)	2 41	XXXVI	D o 37 47'2	26			3'23	5'22	1'99	- 2'4				
(2)	2 32	XXXVIII	E o 13 0'6	28	665	1712	3'25	5'16	1'91	+ 2'3	115	.067	o 25 23'9	- 1281'6
April 22	2 22	XXXVII	D o 54 1'9	8			1'27	5'10	3'83	- 3'6				
Dec. 4,5,6	2 38	XXXVIII	E o 22 51'6	12	909	2170	1'30	5'25	3'95	+ 3'7	154	.071	o 38 26'8	- 2459'4
1851-52														
Nov. 13,14	2 37	XXXVI	D o 26 45'9	8			1'35	5'35	4'00	- 4'1				
Jan. 4,5	2 35	XXXIX	D o 1 58'1	8	665	1985	1'40	5'25	3'85	- 3'9	135	.068	o 12 23'8	- 725'1
Dec. 4,5,8	3 1	XXXVIII	D o 5 55'5	12			1'35	5'25	3'90	- 3'8				
Jan. 3,4,5	3 0	XXXIX	D o 24 0'3	12	399	2076	1'30	5'25	3'95	- 3'9	144	.069	o 9 2'4	+ 553'0
,, 5	2 42	XXXIX	D o 20 46'4	4			1'35	5'25	3'90	- 3'7				
,, 10	2 43	(XIX)	D o 10 17'7	4	514	2173	1'35	5'28	3'93	- 3'7	158	.073	o 5 14'4	- 335'5
Dec. 5,6,8	3 8	XXXVIII	D o 8 2'8	12			1'35	5'25	3'90	- 4'6				
Jan. 10	3 12	(XIX)	D o 16 51'3	4	399	1726	1'30	5'28	3'98	- 4'7	121	.070	o 4 24'2	+ 223'9
Dec. 4,5,6	2 50	XXXVIII	E o 57 32'6	12			1'27	5'25	3'98	+ 4'1				
Nov. 29	2 46	XL	D 1 25 38'1	4	399	1973	1'28	5'35	4'07	- 4'2	148	.075	1 11 35'3	+ 4163'3
April 22	2 16	XXXVII	E o 17 55'8	8			1'29	5'10	3'81	+ 4'2				
Nov. 28,29	2 34	XL	D o 44 24'3	8	909	1844	1'30	5'35	4'05	- 4'5	132	.071	o 31 9'9	+ 1693'8

NOTE.—(XIX) appertains to base-line figures. (1) The mean of observations taken on 12 to 14 November 1851, and 9, 12 February 1855. (2) The mean of observations taken on 4 to 6 December 1851, and 17 to 19 January 1855.

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1851	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Dec. 6	h 2 47	XXXVIII (XVIII)	E 0 26 20.3	4	+	1760	1'35	5'25	3'90	+ 4'5	128	.073	0 38 57.1	+ 2021.1
„ 17,22,23	m 2 42		D 0 51 34.0	12	399		1'30	5'28	3'98	- 4'6				
Nov. 29	2 53	XL (XVIII)	D 0 53 49.4	4		1757	1'35	5'35	4'00	- 4'6	127	.072	0 41 13.6	- 2135.0
Dec. 15,16, 17,22	2 56		E 0 28 37.7	16	1263		1'27	5'28	4'01	+ 4'6				
1851-52		(XIX)	E 0 26 10.3	8		1621	1'27	5'28	4'01	+ 5'0	133	.082	0 37 33.2	+ 1794.1
Jan. 10,11	3 2		D 0 48 56.0	8	445		1'35	5'28	3'93	- 4'9				
Dec. 14,22	3 6	(XVIII)												

NOTE.—(XVIII) and (XIX) appertain to base-line figures.

## PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.

## NORTH-WEST HIMALAYA SERIES.

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	<b>S</b> Solid <b>P</b> Perforated <b>H</b> Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	<b>S</b> Solid <b>P</b> Perforated <b>H</b> Hollow.
(X) . . .	...	7433	2	<b>S</b>	XIV . . .	...	887	8	<b>S</b>
(XI) . . .	...	3140	0	<b>S</b>	XV . . .	...	1870	2	<b>S</b>
I . . .	...	2171	2	<b>S</b>	XVI . . .	...	3812	2	<b>S</b>
II . . .	...	8493	2	<b>S</b>	XVII . . .	...	3341	2	<b>S</b>
III . . .	...	5030	2	<b>S</b>	XVIII . . .	...	2186	2	<b>S</b>
IV . . .	...	1038	2	<b>S</b>	XIX . . .	...	3721	0	†
V . . .	...	9717	2	<b>S</b>	XX . . .	...	2069	2	<b>S</b>
VI . . .	...	1576	2	<b>S</b>	XXI . . .	...	2911	2	<b>S</b>
VII . . .	...	6322	2	<b>S</b>	XXII . . .	...	5247	2	<b>S</b>
VIII . . .	...	1572	2	<b>S</b>	XXIII . . .	...	950	2	<b>S</b>
IX . . .	...	6789	2	<b>S</b>	XXIV . . .	...	2772	2	<b>S</b>
X . . .	...	1574	2	<b>S</b>	XXV . . .	...	7241	20	<b>S</b>
XI . . .	...	3895	2	<b>S</b>	XXVI . . .	...	2243	2	<b>S</b>
XII . . .	...	1935	2	<b>S</b>	XXVII . . .	...	2033	2	<b>S</b>
XIII . . .	...	930	21	<b>S</b>	XXVIII . . .	...	895	2	<b>S</b>

NOTE.—(X) and (XI) appertain to base-line figures. \* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally. † Mark on rock *in situ*.

## PRINCIPAL TRIANGULATION—HEIGHTS ABOVE MEAN SEA LEVEL.

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow
XXIX . .	...	3649	2	S	XXXVI . .	...	3200	2	S
XXX . .	...	3776	2	S	XXXVII . .	...	4375	2	S
XXXI . .	...	3871	2	S	XXXVIII . .	...	1918	2	S
XXXII . .	...	5432	2	S	XXXIX . .	...	2474	2	S
XXXIII . .	...	7791	2	S	XL . .	...	6076	2	S
XXXIV . .	...	3549	2	S	(XVIII) . .	...	3939	2	S
XXXV . .	...	943	2	S	(XIX) . .	...	2142	2	S

The preceding heights determined trigonometrically always refer to the upper mark-stone, or to the upper surface of the pillar on which the theodolite stood.

NOTE.—(XVIII) and (XIX) appertain to base-line figures. \* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally.

J. B. N. HENNESSEY.

## PRINCIPAL TRIANGULATION. AZIMUTHAL OBSERVATIONS.

## NORTH-WEST HIMALAYA SERIES.

Observations at XII,

Lat. N.  $31^{\circ} 17' 40'' \cdot 45$ , Long. E.  $76^{\circ} 14' 25'' \cdot 90 = 5^{\text{h}} 4^{\text{m}} 57^{\text{s}} \cdot 7 = 0 \cdot 212$ , Height above mean sea level 1935 feet,

observed by Mr. G. Logan

with Col. Waugh's 24-inch Theodolite No. 1 read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1853											
31st January	No. 3199 B.A.C. (opp.) (B.A.C.)	East			No levels read	<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	$\pi + 9^{\circ} 24' 36'' \cdot 06$	<i>"</i>	L. $170^{\circ} 26' 51'' \cdot 32$ R. $170^{\circ} 26' 36'' \cdot 00$
		L. 0 3	0 18 55 6 28	0 22 31 54		- 2 40 14	- 18 57 46 42	49 64			
		R. 180 3	55 33 32	20 26 21		2 11 94	45 26	50 80			
		L. 0 3	57 21 18	11 17 78		0 40 49	61 67	34 39			
		R. 180 3	57 33 94	9 5 44		0 26 26	60 20	35 86			
		L. 0 3	57 42 22	4 15 65		0 5 77	47 99	48 07			
		R. 180 3	57 25 42	6 36 01		0 13 88	39 30	56 76			
		L. 0 3	57 2 10	13 14 05		0 55 98	58 08	37 98			
		R. 180 3	56 46 18	15 13 36		1 14 12	60 30	35 76			
31st January	No. 3199 B.A.C. (opp.) (B.A.C.)	West							$\pi - 9^{\circ} 24' 35'' \cdot 89$		L. $170^{\circ} 26' 43'' \cdot 36$
		L. 0 3	- 0 10 21 00	0 17 34 77		+ 1 38 97	- 0 8 42 03	42 08			
		R. 180 3	9 58 60	15 41 48		1 18 82	39 78	44 33			
		L. 0 3	9 6 70	8 38 38	0 23 83	42 87	41 24				
		R. 180 3	9 0 48	6 58 12	0 15 49	44 99	39 12				
		L. 0 3									

NOTE.—R. M. stands for referring mark, and B.A.C. for British Association Catalogue of stars, London 1845.

Observations at XII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1853												
31st January	No. 3199 B.A.C. (opp.) (B.A.C.)	West (contd.)	L. 0 3	0 8 40.72	No levels read	h m s	' "	0 8 40.71	π - 9° 24' 35".89	"	R. 170° 26' 40".23	
			R. 180 3	8 41.48		0 0 10.05	+ 0 0.01	40.48				43.40
				9 5.46		1 46.25	0 1.00	41.03				43.63
				9 24.26		8 46.34	0 24.43	46.61				43.08
						10 53.67	0 37.65			37.50		
1st February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	L. 14 24	-18 56 34.92			0 15 46.00	- 1 18.67	-18 57 53.59	π + 9° 24' 35".70	"	L. 170° 26' 42".73 R. 170 26 40.85
			R. 194 24	56 54.00		13 41.68	0 59.39	53.39			42.11	
				57 57.34		1 44.83	0 0.97	58.31			42.31	
				58 0.26		0 40.55	0 0.15	60.41			37.39	
			L. 14 24	57 27.88			9 4.85	0 26.33	54.21		35.29	
			R. 194 24	57 11.88			11 1.15	0 38.81	50.69		41.49	
				55 53.08			19 2.39	1 56.18	49.26		45.01	
				55 22.30		21 33.78	2 29.12	51.42		46.44		
1st February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	L. 14 24	- 0 12 10.36		0 25 27.41	+ 3 28.12	- 0 8 42.24	π - 9° 24' 35".54	"	L. 170° 26' 42".66 R. 170 26 44.91	
			R. 194 24	11 28.90	22 57.02	2 49.02	39.88			42.22		
				9 50.60	14 57.78	1 11.67	38.93			44.58		
				9 32.66	12 49.45	0 52.60	40.06			45.53		
			L. 14 24	8 42.60		0 33.63	0 0.10	42.50		44.40		
			R. 194 24	8 47.56		3 57.15	0 4.97	42.59		41.96		
				9 14.66		10 35.18	0 35.53	39.13		41.87		
				9 31.78		12 46.52	0 51.70	40.08		45.33		
2nd February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	L. 21 37	-18 57 9.82		0 12 4.99	- 0 46.32	-18 57 56.14	π + 9° 24' 35".34	"	L. 170° 26' 40".68 R. 170 26 37.87	
			R. 201 37	57 23.66		9 51.64	0 30.87	54.53				39.20
				57 55.64		3 35.66	0 4.13	59.77				40.81
				57 57.80		0 45.01	0 0.18	57.98				35.57
			L. 21 37	57 23.42		9 46.42	0 30.47	53.89		37.36		
			R. 201 37	57 8.86		11 53.76	0 45.21	54.07		41.45		
				55 9.52		22 38.44	2 44.39	53.91		41.27		
				54 15.58		26 20.01	3 42.62	58.20		41.43		



Observations at XII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1853												
5th February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	L. 28 48 R. 208 48	0 18 56 19'58 56 53'44 57 44'00 57 49'64	No levels read	h m s	' "	0 17 15'45 13 51'93 5 40'68 2 46'23	- 1 34'21 1 0'92 0 10'26 0 2'45	- 18 57 53'79 54'36 54'26 52'09	40'47 39'90 40'00 42'17	L. 170° 26' 39".04 R. 170 26 40 '90
L. 28 48 R. 208 48	57 52'42 57 38'62 56 52'22 56 31'46	3 53'79 7 16'31 13 58'33 15 54'63	0 4'83 0 16'86 1 2'43 1 21'00	57'25 55'48 54'65 52'46		37'01 38'78 39'61 41'80						
5th February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	L. 28 48 R. 208 48	- 0 9 27'76 9 14'48 8 46'94 8 43'16		0 11 40'76 9 40'45 2 42'38 0 44'14	+ 0 43'59 0 29'89 0 2'33 0 0'17	- 0 8 44'17 44'59 44'61 42'99	9° 24' 34".26 π 9° 24' 34".09 π	41'74 41'32 41'30 42'92	L. 170° 26' 41".15 R. 170 26 41 '23	
L. 28 48 R. 208 48	10 2'56 10 22'78 11 59'06 12 33'70	15 42'44 17 30'71 24 50'84 26 51'14	1 18'07 1 36'98 3 14'58 3 47'07	44'49 45'80 44'48 46'63		41'42 40'11 41'43 39'28						
6th February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	L. 7 14 R. 187 13	- 0 10 21'06 9 55'12 9 8'36 9 0'00		0 17 39'47 15 19'10 8 42'05 6 51'76	+ 1 39'85 1 15'10 0 24'17 0 15'03	- 0 8 41'21 40'02 44'19 44'97	9° 24' 33".74 π	45'05 46'24 42'07 41'29		L. 170° 26' 44".51 R. 170 26 41 '06
L. 7 14 R. 187 13	8 43'22 8 45'36 9 19'18 9 33'78	0 38'43 2 53'79 10 20'97 12 13'26	0 0'13 0 2'67 0 33'98 0 47'34	43'09 42'69 45'20 46'44		43'17 43'57 41'06 39'82						
7th February	No. 3199 B.A.C. (opp.) (B.A.C.)	East	L. 7 14 R. 187 14	- 18 56 12'62 56 31'92 57 32'12 57 50'40		0 17 25'78 15 17'44 7 48'26 0 46'10	- 1 36'08 1 14'00 0 19'35 0 0'19	- 18 57 48'70 45'92 51'47 50'59	9° 24' 33".54 π + 9° 24' 33".54	44'84 47'62 42'07 42'95	L. 170° 26' 45".91	

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1853												
7th February	No. 3199 B.A.C. (opp.) (B.A.C.)	East (contd.)	L. 7 14	0' 18" 57' 31" 62	No levels read	<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	π + 9° 24' 33".54	"	R. 170° 26' 42".35	
			R. 187 14	57' 24" 86		0 6 57.08	- 0 15.41	- 18 57 47.03				
				56' 25" 92		8 40.36	0 24.01	48.87				
				56' 0" 22		16 25.59	1 26.37	52.29				
						18 32.92	1 50.21	50.43				
7th February	No. 3199 B.A.C. (opp.) (B.A.C.)	West	L. 21 37	- 0 9 59.74			<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	π - 9° 24' 33".38	"	L. 170° 26' 43".90 R. 170 26 38.15
				9 40.32		0 15 18.00	+ 1 14.88	- 0 8 44.86				
			R. 201 37	9 8.66		13 29.71	0 58.22	42.10				
				8 55.40		7 23.74	0 17.44	51.22				
			L. 21 37	8 43.36		5 13.40	0 8.69	46.71				
				8 46.32		0 43.54	0 0.17	43.19				
			R. 201 37	9 37.38	4 11.09	0 5.58	40.74					
				9 58.28	12 44.45	0 51.46	45.92					
					14 40.76	1 8.24	50.04					

Mean Azimuth of R. M. by Eastern Elongation	.. .. .	170 26 41.76
Do. do. do. by Western do.	.. .. .	170 26 42.12
Concluded do. do. by both Elongations	.. .. .	170 26 41.94
Angle XIV and R. M. as below	.. .. .	- 105 43 5.73
Observed Azimuth of XIV	.. .. .	64 43 36.21
Computed do. do. in terms of the initial value adopted at Kaliánpur, see page 21—c	.. .. .	64 43 42.29
Observed—Computed Azimuth	.. .. .	6.08

At XII

January and February 1853, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	254° 20'	74° 19'	261° 29'	81° 29'	268° 41'	88° 41'	275° 54'	95° 54'	283° 5'	103° 5'	
XIV & R. M.	<i>h</i> 5.50	<i>l</i> 5.42	<i>h</i> 6.72	<i>h</i> 6.46	<i>h</i> 7.30	<i>l</i> 4.30	<i>l</i> 5.60	<i>l</i> 4.14	<i>h</i> 4.44	<i>l</i> 6.24	M = 5".73 w = 10.36 $\frac{1}{w}$ = 0.10 C = 105° 43' 5".73
	<i>h</i> 7.02	<i>l</i> 5.16	<i>h</i> 6.70	<i>h</i> 6.48	<i>h</i> 6.78	<i>l</i> 4.24	<i>l</i> 5.44	<i>h</i> 5.84	<i>h</i> 5.18	<i>l</i> 5.92	
	<i>h</i> 6.46							<i>h</i> 4.22			
	6.33	5.29	6.71	6.47	7.04	4.27	5.52	4.73	4.81	6.08	

Observations at XXXVIII,

Lat. N. 33° 16' 48".84, Long. E. 73° 12' 53".69 = 4<sup>h</sup> 52<sup>m</sup> 51<sup>s</sup>.58 = 0.203, Height above mean sea level 1918 feet,

observed by Mr. G. Logan

with Lieut.-Col. Waugh's 24-inch Theodolite No. 1 read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1851						<i>h m s</i>	<i>' "</i>	<i>° ' "</i>					
4th December	ε Ursæ Minoris (conj.) (N.A.)	West	L. 0 1	+ 11 16 57.96	No levels read	0 28 13.71	+ 4 12.78	+ 11 21 10.74	π - 9° 15' 11".33	59.41	L. 182° 5' 57".41 R. 182 5 64.99		
				17 43.92		25 31.31	3 26.45	21 10.37		59.04			
			R. 180 0	19 50.12		16 43.99	1 28.49	21 18.61		67.28			
				20 13.86		13 54.57	1 1.10	21 14.96		63.63			
			L. 0 1	21 1.88		3 50.06	0 4.63	21 6.51		55.18			
				21 6.46		1 39.74	0 0.87	21 7.33		56.00			
		R. 180 0	20 54.44	8 21.76		0 21.89	21 16.33	65.00					
			20 36.12	11 12.19		0 39.25	21 15.37	64.04					
	4th December	ε Ursæ Minoris (conj.) (N.A.)	East	L. 0 1		- 7 1 57.34	0 37 29.34	- 7 14.03		- 7 9 11.37	π + 9° 15' 11".56	60.19	L. 182° 5' 62".86 R. 182 5 68.85
						4 6.34	31 3.38	4 58.86		9 5.20		66.36	
				R. 180 0		6 2.64	23 51.30	2 56.94		8 59.58		71.98	
						6 35.00	21 56.01	2 29.71		9 4.71		66.85	
L. 0 1				7 56.10	14 45.94	1 8.08	9 4.18	67.38					
				8 28.84	11 29.45	0 41.28	9 10.12	61.44					
	R. 180 0	9 3.98	0 11.76	0 0.01	9 3.99	67.57							
		9 1.46	1 52.55	0 1.11	9 2.57	68.99							
	L. 0 1	8 51.08	8 7.49	0 20.80	9 11.88	59.68							
		8 35.60	10 21.82	0 33.87	9 9.47	62.09							
5th Dec.	ε Ur. Min. (conj.) (N.A.)	West	L. 7 13	+ 11 19 37.66	0 17 43.61	+ 1 39.34	+ 11 21 17.00	π - 9° 15' 11".77	65.23	L. 182° 5' 65".11			
				20 4.96	15 19.25	1 14.16	21 19.12		67.35				
			R. 187 13	20 47.22	8 32.24	0 22.97	21 10.19		58.42				
				20 58.78	6 16.90	0 12.43	21 11.21		59.44				

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XXXVIII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851											
5th December	$\epsilon$ Ur. Min. (conj.) (N. A.)	West (contd.)	L. 7 13	+ 11 21 16.20 21 10.50	No levels read	h m s	' "	° ' "	$\pi - 9^{\circ} 15' 11''.77$	64.66 63.21	R. 182° 5' 58''.90
			R. 187 13	20 22.80 20 2.28		0 0 51.17 3 46.61 12 21.89 14 48.26	+ 0 0.23 0 4.48 0 47.78 1 8.42	+ 11 21 16.43 21 14.98 21 10.58 21 10.70		58.81 58.93	
5th December	$\epsilon$ Ursæ Minoris (conj.) (N. A.)	East	L. 7 13	- 7 6 57.46 7 27.68		0 20 37.59 17 37.14	- 2 12.48 1 36.81	- 7 9 9.94 9 4.49	$\pi + 9^{\circ} 15' 11''.99$	62.05 67.50	L. 182° 5' 55''.89 R. 182 5 56 .83
			R. 187 13	8 54.34 8 58.34		9 30.92 6 49.51	0 28.33 0 14.60	9 22.67 9 12.94		49.32 59.05	
			L. 7 13	9 3.94 9 4.24		0 1.49 2 22.87	0 0.00 0 1.78	9 3.94 9 6.02		68.05 65.97	
			R. 187 13	8 38.56 8 10.68		10 32.10 13 52.61	0 35.00 1 0.81	9 13.56 9 11.49		58.43 60.50	
6th December	$\epsilon$ Ursæ Minoris (conj.) (N. A.)	West	L. 14 25	+ 11 19 41.40 20 8.52		0 17 32.62 14 55.22	+ 1 37.31 1 10.31	+ 11 21 18.71 21 18.83	$\pi + 9^{\circ} 15' 12''.20$	66.51 66.63	L. 182° 5' 65''.34 R. 182 5 57 .86
			R. 194 25	20 56.18 21 5.46		6 41.98 4 38.67	0 14.14 0 6.79	21 10.32 21 12.25		58.12 60.05	
			L. 14 25	21 15.24 21 9.86		1 39.28 4 36.72	0 0.86 0 6.67	21 16.10 21 16.53		63.90 64.33	
			R. 194 25	20 8.88 19 48.10		13 52.12 16 4.45	1 0.07 1 20.63	21 8.95 21 8.73		56.75 56.53	
6th December	$\epsilon$ Ursæ Minoris (conj.) (N. A.)	East	L. 28 48	- 7 6 57.32 7 28.80		0 19 49.92 17 0.50	- 2 2.53 1 30.23	- 7 8 59.85 8 59.03	$\pi + 9^{\circ} 15' 12''.43$	72.58 73.40	L. 182° 5' 69''.15 R. 182 5 59 .66
			R. 208 48	8 49.02 9 4.24		8 15.22 4 34.67	0 21.33 0 6.57	9 10.35 9 10.81		62.08 61.62	
			L. 28 48	9 5.00 9 3.02		1 51.27 4 2.59	0 1.08 0 5.15	9 6.08 9 8.17		66.35 64.26	
			R. 208 48	8 20.90 7 59.52		13 3.92 15 28.28	0 53.89 1 15.61	9 14.79 9 15.13		57.64 57.30	

Observations at XXXVIII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1851											
7th December	$\epsilon$ Ursæ Minoris (conj.) (N. A.)	West	L. 28 48 R. 208 48	+ 11 19 23.86 19 46.30 20 51.04 20 57.48	No levels read	<i>h m s</i> 0 18 56.65 16 43.32 8 10.06 5 57.74	<i>' "</i> + 1 53.51 1 28.37 0 21.03 0 11.19	<i>o ' "</i> + 11 21 17.37 21 14.67 21 12.07 21 8.67	$\pi - 9^\circ 15' 12''.63$	" 64.74 62.04 59.44 56.04	L. 182° 5' 64".11 R. 182 5 58.34
7th December	$\epsilon$ Ursæ Minoris (conj.) (N. A.)	East	L. 21 37 R. 201 37	- 7 6 39.82 7 15.84 8 43.28 8 55.80	No levels read	<i>h m s</i> 0 20 55.60 18 16.20 10 9.97 7 12.53	<i>' "</i> - 2 16.34 1 44.06 0 32.33 0 16.28	<i>o ' "</i> - 7 8 56.16 8 59.90 9 15.61 9 12.08	$\pi + 9^\circ 15' 12''.86$	" 76.70 72.96 57.25 60.78	L. 182° 5' 71".51 R. 182 5 57.96
8th December	$\epsilon$ Ursæ Minoris (conj.) (N. A.)	West	L. 21 37 R. 201 37	+ 11 19 48.02 20 10.74 20 50.64 21 0.06	No levels read	<i>h m s</i> 0 17 2.28 14 34.91 6 8.63 4 26.37	<i>' "</i> + 1 31.75 1 7.15 0 11.89 0 6.20	<i>o ' "</i> + 11 21 19.77 21 17.89 21 2.53 21 6.26	$\pi - 9^\circ 15' 13''.06$	" 66.71 64.83 49.47 53.20	L. 182° 5' 67".28 R. 182 5 51.85
8th December	$\epsilon$ Ursæ Minoris (conj.) (N. A.)	West	L. 21 37 R. 201 37	21 20.98 21 13.04 19 59.72 19 42.74	No levels read	<i>h m s</i> 1 58.59 5 11.08 14 32.49 16 14.75	<i>' "</i> 0 1.23 0 8.43 1 6.03 1 22.35	<i>o ' "</i> 21 22.21 21 21.47 21 5.75 21 5.09	$\pi - 9^\circ 15' 13''.29$	" 69.15 68.41 52.69 52.03	L. 182° 5' 67".28 R. 182 5 51.85
8th December	$\epsilon$ Ur. Min. (conj.) (N. A.)	East	L. 14 25 R. 194 25	- 7 7 1.82 7 29.04 8 45.14 8 58.76	No levels read	<i>h m s</i> 0 20 13.17 17 39.78 10 21.68 7 59.32	<i>' "</i> - 2 7.33 1 37.29 0 33.59 0 19.98	<i>o ' "</i> - 7 9 9.15 9 6.33 9 18.73 9 18.74	$\pi + 9^\circ 15' 13''.29$	" 64.14 66.96 54.56 54.55	L. 182° 5' 66".40

Observations at XXXVIII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation.	Mean by each Face
1851	ε Ur. Min. (conj:) (N.A.)	East (contd.)		° ' "	No levels read	<i>h m s</i>	' "	° ' "	π + 9° 15' 13".29	"	R. 182° 5' 55".54
L. 14 25			- 7 9 5.24	0 0 6.13		- 0 0.00	- 7 9 5.24	68.05			
L. 14 25			9 4.98	2 26.25		0 1.87	9 6.85	66.44			
R. 194 25			8 48.88	9 28.31		0 28.29	9 17.17	56.12			
			8 28.80		12 16.74	0 47.58		9 16.38		56.91	

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	182	6	3.46
Do. do. do. by Western do.	...	...	...	...	182	6	1.12
Concluded do. do. by both Elongations	...	...	...	...	182	6	2.29
Angle R. M. and XL, see page 50—c	...	...	...	32° 21' 21".02			
Proportional part of correction to find final value of ditto, see pages 50—c, 51—c, and triangle No. 786, page 19—c					-	0.17	+ 32 21 20.85
Observed Azimuth of XL	...	...	...	...			214 27 23.14
Computed do. do. in terms of the initial value } adopted at Kaliánpur, see page 23—c	...	...	...	...			214 27 23.13
Observed — Computed Azimuth	...	...	...	...			+ 0.01

J. B. N. HENNESSEY.

Fig. No. 40

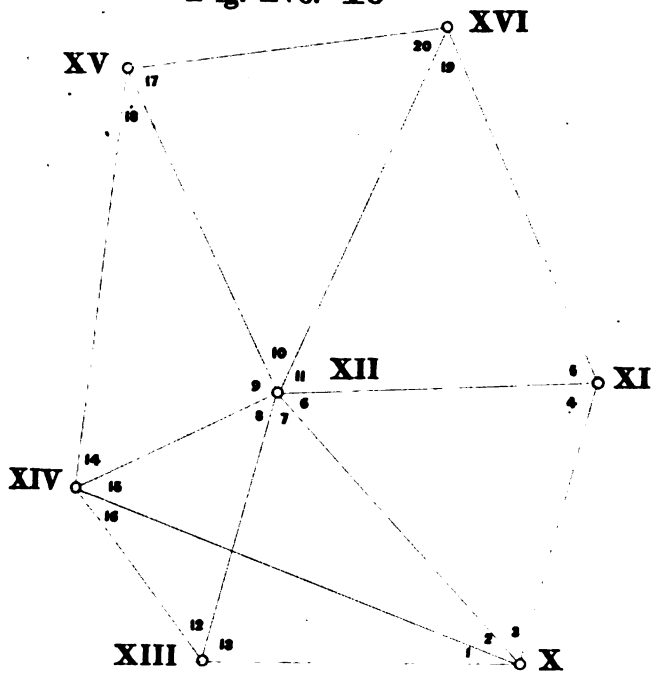


Fig. No. 41

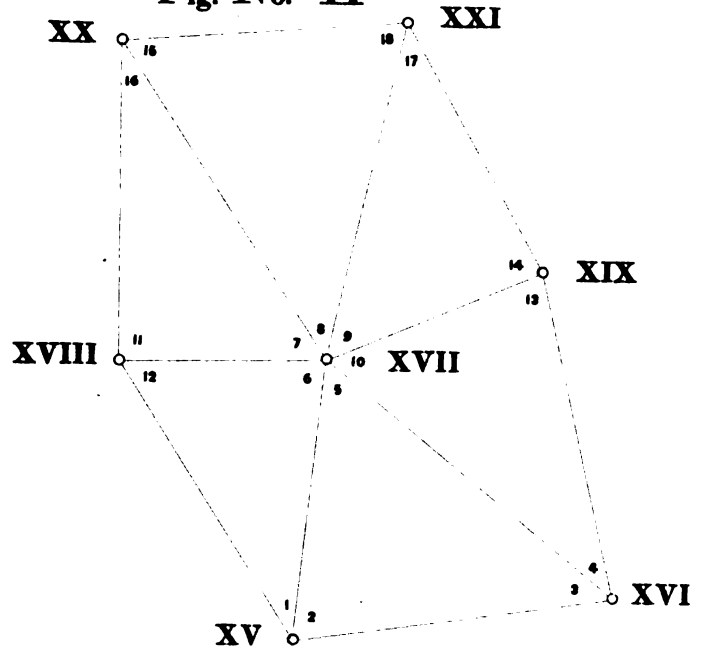


Fig. No. 38

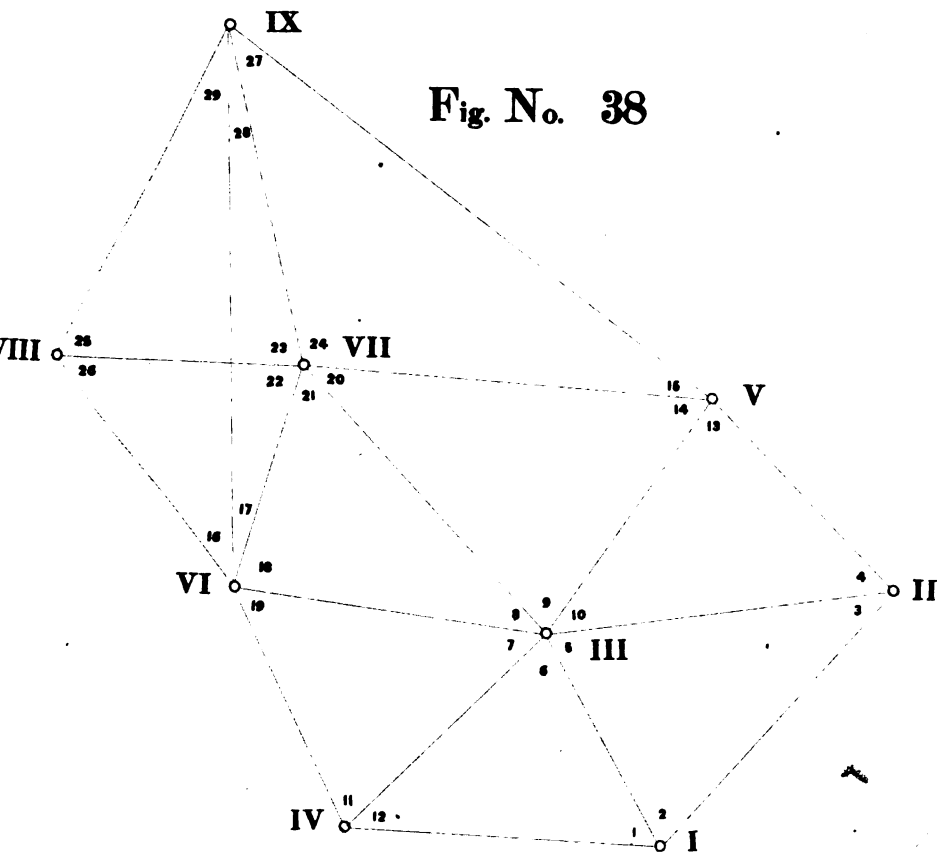


Fig. No. 39

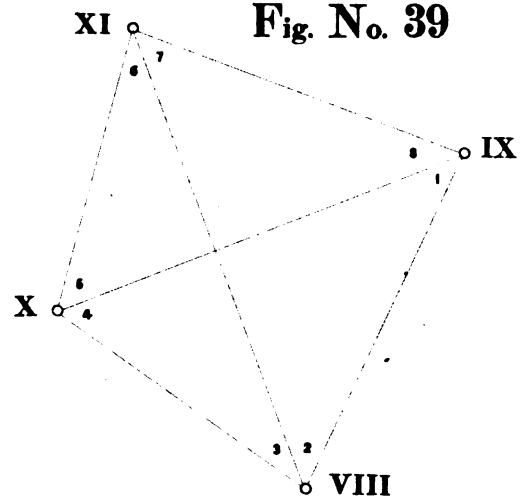
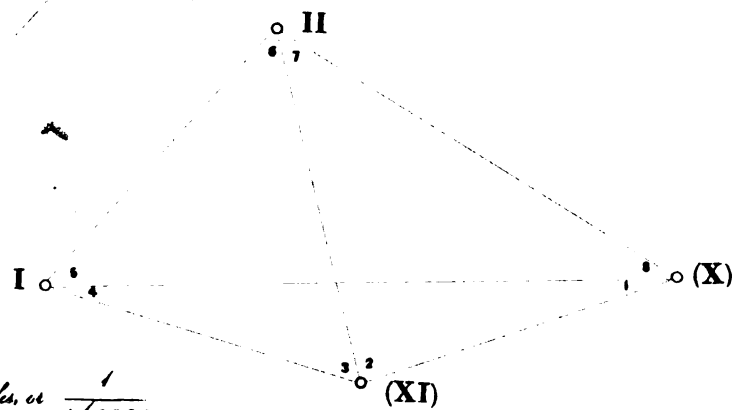


Fig. No. 37



Scale 1 Inch = 12 Miles, or  $\frac{1}{760320}$





Fig. No. 46

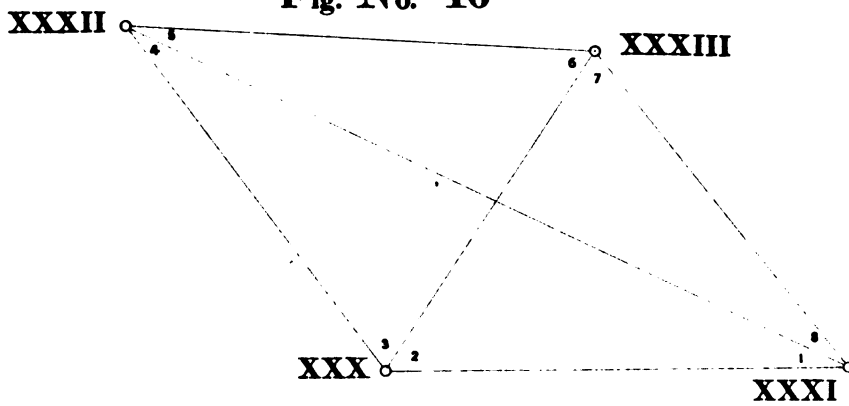


Fig. No. 44

Fig. No. 45

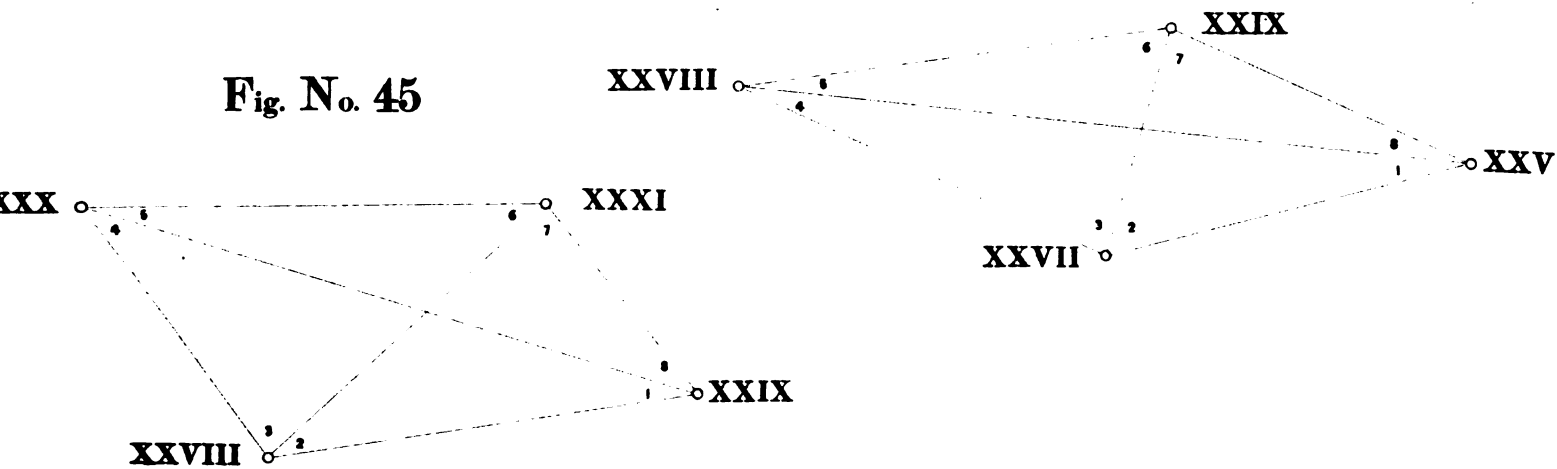


Fig. No. 42

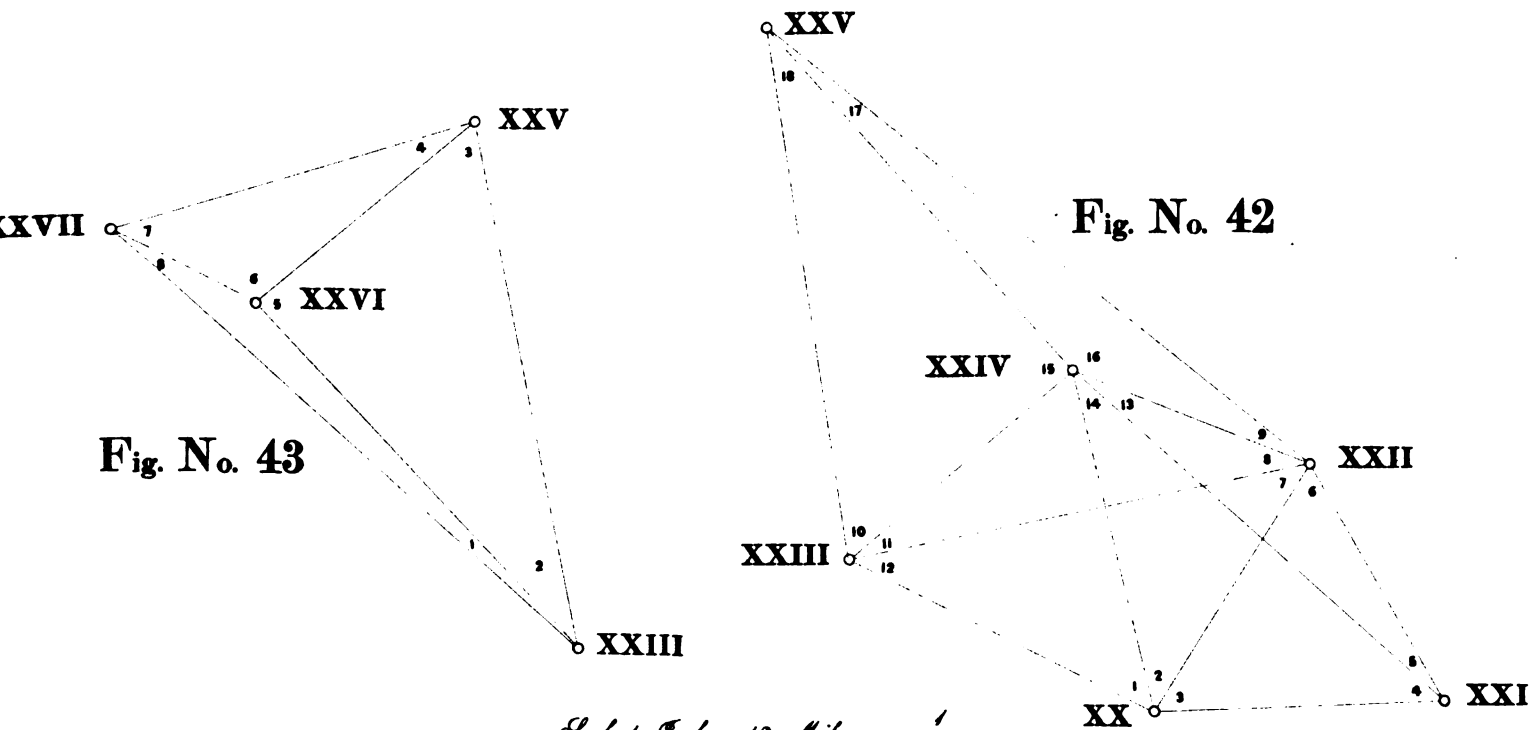


Fig. No. 43

Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



Fig. No. 48

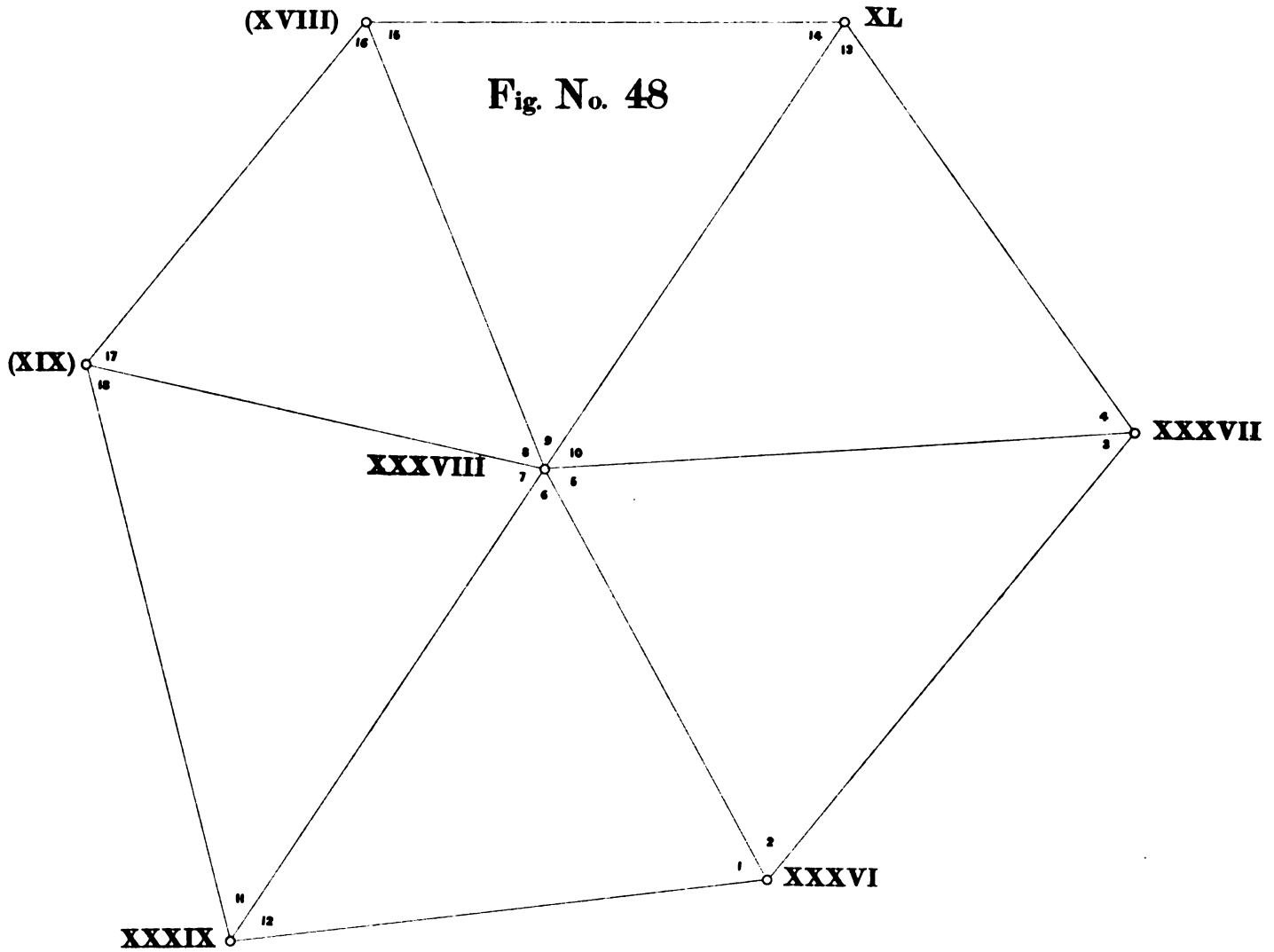
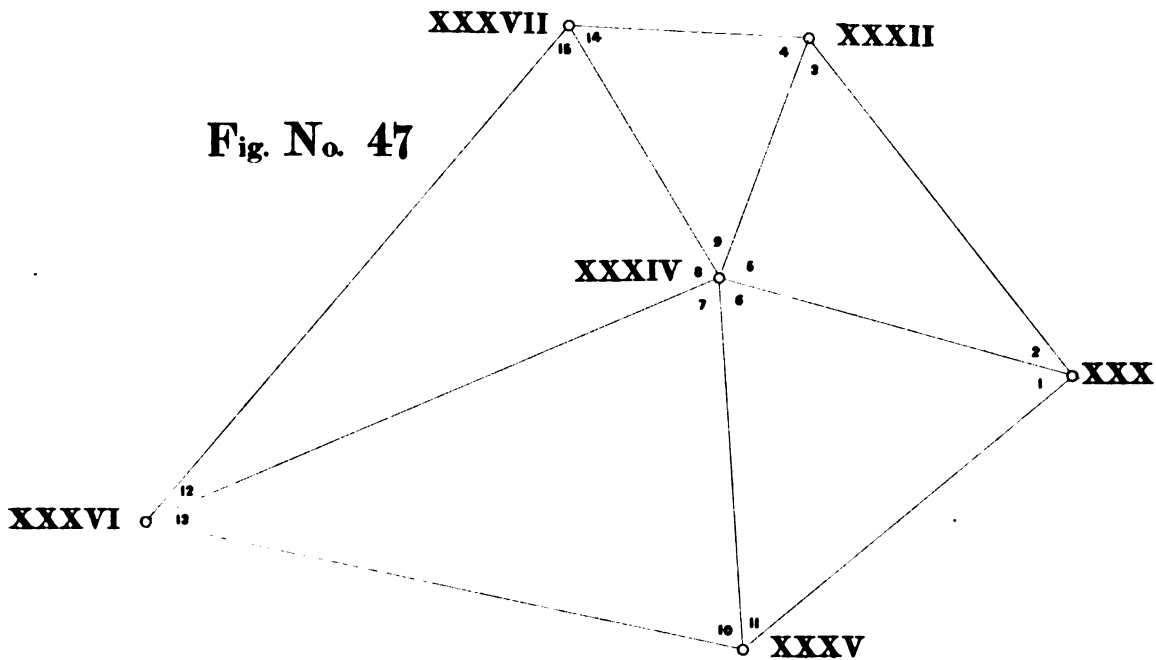


Fig. No. 47



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



**GREAT INDUS SERIES.**



## GREAT INDUS SERIES

### INTRODUCTION

This Chain of Triangles is the western side of the great quadrilateral figure—known departmentally as the North-West Quadrilateral—which is formed by the triangulation whose periphery directly connects the base-lines at Sironj (in Central India), Dehra Dún, Chach (near Attock) and Karáchi. The Indus Series was accomplished during the years 1853 to 1861, and carried as closely to the western frontier of the British Empire as was consistent with the safety of the persons employed from the predatory attacks of the independent tribes beyond the border. It traverses the valley of the River Indus, sometimes wholly on the right or on the left bank, but more frequently with one flank on each bank, for a distance of about 560 miles, from a little below Attock to a little below Shikarpur, whence it passes some way to the west of the river, and trends southwards, with its western flank on the hills bordering Beluchistan, for a distance of 190 miles, and then terminates at Karáchi. At present this chain of triangles may be regarded as the rubicon of the conquests of science and civilization in Western India, but eventually it may also serve as a basis for the extension of geodetic operations into Beluchistan, Afghanistan and Persia, when the Rulers of those countries become sufficiently enlightened to appreciate the value of such undertakings. It has had to follow an irregular boundary line and therefore its course necessarily deviates from the normal direction of the chains of triangles of this Survey, which is usually either meridional or along a parallel of latitude.

The series was begun, under the instructions of Colonel A. Scott Waugh, at its northern extremity, a little below Attock in the Ráwal Pindi District, early in the year 1853, by Mr. George Logan, immediately after that gentleman had completed the polygonal figure around the Chach base-line which gave a terminal side to the North-West Himalayan triangulation and an initial side to that on the Indus.

Season 1852-53.

The Ráwal Pindi District is admirably adapted for trigonometrical operations, presenting a succession of bare unwooded hills of commanding altitude, which are easily accessible and give a wide and unobstructed range of view; thus in the course of a few months Mr. Logan was able to complete a double polygon which carried the principal triangulation down to the neighborhood of Kalabagh, a distance of over

## PERSONNEL.

G. Logan, Esquire, 1st Assistant.  
 Mr. W. R. N. James, 1st Class Sub-Assistant.  
 „ W. H. Johnson, 2nd Class Sub-Assistant.  
 „ C. J. Carty, Do.  
 „ G. Shelverton, Do.

70 miles. These operations were then urgently required to furnish a basis for the Topographical Survey of the Jhilam and Ráwal Pindi Districts which was being commenced by Lieutenant D. G. Robinson of the Bengal Engineers; and also to connect with the general surveys of India the Military Reconnoissance of the Trans-Indus Districts of Peshawur, Kohat, Bannú and Dera Ismáil Khán by Lieutenant J. T. Walker of the Bombay Engineers, which was then approaching completion. There was however no immediate necessity for the further extension of the triangulation at the northern extremity of the Indus Series; operations were therefore suspended in this quarter for some years.

Meanwhile Captain A. Strange, of the Madras Cavalry, assisted by Lieutenant J. F. Tennant, of the Bengal Engineers, was finishing the southern side of the North-West Quadrilateral, *viz.* the Longitudinal Series which had been carried westwards from the Sironj base-line, on the Great Arc, towards the line selected for a base of verification at Karáchi. After the completion of these operations and pending the measurement of the base-line,

## Season 1853-54.

Mr. C. Lane, Civil Assistant.  
 „ C. Burt, Sub-Assistant.

Lieutenant Tennant was employed, during the field season of 1853-54, in commencing the triangulation of the southern section of the Indus Series, with the assistants mentioned in the margin, which he carried northwards by observations at 12 principal stations, forming 16 triangles and extending over a distance of 90 miles; an admirable first performance, executed under many difficulties.

The Karáchi base-line was measured in the field season of 1854-55, when Colonel

## Season 1854-55.

Waugh went to Karáchi to supervise the measurement and inspect Captain Strange's party. Mr. (now Sir Bartle) Frere, the Chief Commissioner of the Province of Sind, took the opportunity of representing to Colonel Waugh the urgent necessity that existed for the immediate extension of the great triangulation northwards through Sind, to furnish data for Topographical and Fiscal Surveys, declaring that such a measure would form a lasting claim on the gratitude of every public servant in the Province. In consequence of these representations, Mr. W. C. Rossenrode was deputed by Colonel Waugh to select stations and complete all the requisite preliminaries for the future triangulation, while the base-line was being measured. Mr. Rossenrode worked with great vigor, carrying his operations through the whole of western Sind and into the Panjáb, to the neighborhood of Uch; and though it was afterwards found necessary to make considerable deviations from his scheme for the triangulation, which had been somewhat hurriedly designed, much of it was retained and found to be satisfactory.



In the field season of 1855-56, Lieut. J. F. Tennant carried the principal triangulation over the hill ranges north of Karáchi into the plains of Mehar and Lárkhána, a distance of 96 miles, by 5 quadrilateral and 2 hexagonal figures comprising 34 triangles; this was an exceedingly satisfactory performance, the more so that some delay was occasioned by having to remodel a portion of the original design for the triangulation and to build new stations, in place of those which had been rejected.

Season 1855-56.

ASSISTANTS.

Mr. J. W. Armstrong,	Civil Assistant.
„ N. A. Belletty,	Sub-Assistant.
„ J. Smith,	„
„ W. Dyer,	„

The immediate wants of Sind having been thus satisfied, it was necessary to provide for the requirements of portions of the Panjáb where Revenue Surveys were in progress for which trigonometrical data were urgently wanted. Operations were therefore suspended at the southern end of the Indus Series, and resumed at the northern end, to which Lieut. J. T. Walker was deputed—with Lieut. J. P. Basevi and the assistants mentioned in the margin—at the commencement of the field season of 1856-57.

Season 1856-57.

Mr. N. A. Belletty,	Sub-Assistant.
„ C. J. Carty,	Do.
„ E. T. Donnelly,	Do.
„ A. W. Donnelly,	Do.

Under Colonel Waugh's instructions the Series was intended to be *double* throughout, *i.e.* formed of polygonal self-verificatory figures, instead of single triangles. The breadth of such a series is necessarily very considerable, and the choice of the line to be taken at the outset of the operations in the northern section was somewhat embarrassing; for the plains of the Deraját, lying between the River Indus and the Sulimáni mountains, are too narrow to permit of a double series without serious risk on the western flank from the attacks of the predatory hill tribes; on the other hand the plains of the Sind Saugar Doab, lying east of the Indus, beyond the richly cultivated low-lands in the immediate vicinity of the river, are sandy wastes, with very little water and that mostly brackish, very thinly populated and having but a few isolated hamlets scattered over them; this country therefore did not immediately require to be triangulated. For these reasons it was determined to adopt a medium course and carry the triangulation in the vicinity of the river, with one flank on each bank, until such time as it might be conveniently brought over wholly to the western bank.

During the course of the first field season the principal triangulation was extended from the side Bani to Sakesar near Kalabagh, where Mr. Logan's operations had terminated, to the side Mandra to Ahmad-Sindi near Dera Ismáil Khan, while the approximate series was carried down to Dera Fathi Khan. One of the most interesting features in the operations of the season was the placing a principal station on the range of hills west of the Indus, between Kalabagh and Isakhel, which was occupied by the Bárak branch of the tribe of Khattaks, who though in nominal subjection to the British power had not yet been brought under full control; occupying wild and intricate hill fastnesses, in which they were secure from attack, they had ever enjoyed the felicity of making occasional raids on their neighbours in the plains, and returning with impunity to their homes, until the establishment of British rule over the Panjáb. To pay them a casual visit was not difficult, but to locate a party of Hindostani signallers among them for several weeks, and get them to aid in the construction

of a road for the great theodolite through their hills, were delicate and difficult matters. Captain Henderson, the Deputy Commissioner of the District, sanctioned the attempt being made by Lieutenant Walker who had previously visited those hills during his military surveys on the Trans-Indus Frontier; the operations were carried out successfully, without any collisions; the hill men were found to be courteous and obliging, but somewhat suspicious about the road, which would facilitate military operations against them.

The field operations terminated in the month of May 1857, simultaneously with the outbreak of the great mutiny of the Bengal Army, which for a time threatened the existence of the British power in India. Lieutenant Walker volunteered for military service and was appointed by Sir John Lawrence to the Staff of Brigadier General (now Major General Sir Neville) Chamberlain, who had been placed in command of the Panjáb Moveable Column. Subsequently when General Chamberlain joined the force which was beseiging Dehli, Lieutenant Walker accompanied him and shared as Field Engineer in the operations of the seige, until he was incapacitated for further service by a severe wound followed by an attack of cholera. Meanwhile Lieutenant Basevi was transferred to assist Lieutenant Montgomerie in the Survey of Kashmir and the surrounding mountain ranges, a duty more trying than and almost as dangerous as active field service, for the surveyors were alone and almost unprotected in the midst of a rude population, amongst whom the belief was prevalent that the British power was rapidly being undermined and consequently that British Officers might be robbed or even murdered with impunity. Messrs. Belletty and Carty and the two Messrs. Donnelly spent the recess at the sanatorium of Murree (Marri) where they rendered good service in aiding to defend the many English women and children who were congregated there from the attacks of the surrounding insurgents. A native Jemadar, by name Rámzán Khan, had been sent down to the Head Quarters at Dehra Dún in charge of one of the valuable great theodolites of the survey, with a party of twenty carriers; they suddenly found themselves one morning surrounded by a swarm of rebels and mutineers; happily the day had not dawned and the Jemadar adroitly availed himself of the darkness to conceal the theodolite in a neighboring jungle, and eventually he managed to convey his charge in safety to Dehra Dún.

Shortly after the re-capture of Dehli, in September 1857, operations were resumed on the Indus Series on an enlarged scale, both extremities of the triangulation being taken up simultaneously. For the valley of the Indus was now the safest and quietest portion of the Punjab, the tribes inhabiting it having sent all their warriors to aid the British Troops; Sind also was not only tranquil but furnishing aid. But in the Gogaira and neighbouring districts, in which the

NORTHERN SECTION.

Mr. N. A. Belletty, Civil Assistant.  
 „ C. J. Carty, Do.  
 „ E. T. Donnelly, Sub-Assistant.  
 „ A. W. Donnelly, Do.

SOUTHERN SECTION.

Mr. G. Byall, Sub-Assistant.

operations of the Jogí-Tíla Series should have been progressing, the inhabitants were in a state of insurrection; the surveyors were therefore transferred to Sind and employed on the southern section of the Indus Series. The operations in both sections were placed under the direction of Lieutenant (then Captain) Walker, with

Lieutenant Basevi in immediate charge of the northern, and Mr. J. W. Armstrong in that of the southern section, and with the assistants marginally named.

But even in the Western Panjáb and Sind it was not considered advisable to expose the valuable great theodolites of the Survey to the risk of meeting with injury at the hands of bands of marauders, more especially as the guards available for the protection of the surveyors were very insufficient. Captain Walker represented to Colonel Waugh that even before the rebellion broke out he had always felt uneasy about taking a great theodolite across the Indus, and that in planning the approximate series he had been careful to place the stations on the right bank at no greater distance from the river than was necessary to protect them from the annual inundations during the summer months, and to preserve the symmetry of the triangulation; yet there was scarcely a station to the south of Dera Ismáíl Khán which was not within three or four hour's march of the foot of the Súlímání mountains. The surveyors would consequently be liable to be attacked by night and plundered with perfect impunity, unless strongly guarded, as the assailants might easily escape to their hill fastnesses before a sufficient force could be collected to pursue them. The principal stations had frequently to be occupied for a week or ten days consecutively, and this would give any marauders ample time to plan and carry out an attack; the instruments, though really useless to them, might well excite their cupidity, and at that time the cupidity of our own subjects as well as of the border tribes had to be provided against.

Consequently the great theodolites were deposited for safety at the nearest Military Stations and no principal triangulation was attempted; the operations of the field season were entirely restricted to secondary triangulation with small instruments, to the selection of sites for the principal stations, and to the construction of the stations and the clearance of the lines between them.

And these were important and very laborious undertakings, for the operations at both extremities of the Series were now fairly launched into the plains of the Valley of the Indus, which are perfectly flat and almost entirely devoid even of natural or artificial mounds, and are therefore very unfavorable for triangulation. In a distance of about 400 miles from above Dera Ismáíl Khán to below Shikárpur it was eventually found necessary to have 117 principal stations; of these one only is situated on a hill, five are on artificial mounds—the sites of ruined forts and villages—and the remainder are on ground either entirely level or so slightly elevated as to require the construction of towers ranging from 15 to 40 feet in height for the operations, in addition to which the lines between the towers had also to be cleared in order to ensure the requisite mutual visibility.

The River Indus during its course southwards, through the plains of the Derajat and Sind Saugar, is flanked on the east for a considerable distance by a line of sand hills, the edge of the plateau or steppe—locally known as the *bár* or *thál*,—which separates the low-lands of this river from those of the adjoining river Jhílam. Above Dera Ismáíl Khán, where the distance from the line of sand hills to the right bank of the river is only about ten miles, two quadrilateral figures were introduced into the triangulation, for the first time such figures have ever been used on plains in the operations of this Survey, for their long

diagonals are unsuited for operations over a flat country, as the rays of light passing over them are liable to graze the surface of the ground and become obstructed; but in this instance the diagonals pass freely above the river, and the arrangement was found entirely satisfactory. It would have been repeated further south but that the line of sand hills became lower and trended further away from the opposite bank of the river, which necessitated the introduction of polygonal figures instead.

During the field season of 1857-58 the preliminary operations of selecting sites for stations were carried over a distance of 120 miles in the northern and 100 miles in the southern section, leaving a gap of 90 miles to be completed in the following season. The cutting of trial lines through the acacia jungles in the Jacobabad District was found to be a very laborious proceeding, the line cutters been frequently unable to open out more than a mile's length of narrow line in a day. A large number of lines had to be carried across the river, between the stations on the opposite banks, over low lands and islands covered with high grass and tamarisk jungle; and the accurate alignment and clearance of these lines was a matter of no small difficulty.

In the field season 1858-59 four separate parties were employed on the Indus Series, under the supervision of Captain—then Brevet-Major—Walker, who had recently received

Season 1858-59.

CIVIL AND SUB ASSISTANTS.

Mr. N. A. Belletty.  
 „ C. J. Carty.  
 „ G. Ryall.  
 „ A. W. Donnelly.  
 „ M. C. Hickie.  
 „ W. F. Trotter.

promotion by Brevet for his military services during the rebellion. One of the parties, under Lieutenant Basevi, was deputed to resume the principal triangulation of the northern section; a second, under Mr. H. Keelan, was similarly employed in the southern section; a third, under Mr. J. W. Armstrong, in completing the approximate series; and a fourth in executing a line of spirit levels, with Major Walker's personal co-operation, and the assistance of Lieutenant B. R. Branfill.

The circumstance which has already been mentioned that nearly 400 miles of the triangulation would have to pass over a perfectly level plain, without hills and almost without any mounds, led to the initiation of operations for determining the heights of the stations in the plains by the method of spirit-leveling; for it was feared that, with rays grazing the surface of the ground so closely, the vertical angles measured in the triangulation would be so much affected by the very considerable variations of terrestrial refraction to which they would be liable, that a considerable amount of error might be generated in the course of operations carried over so great a distance under such unfavorable circumstances. Full details of the spirit-leveling operations of this survey, the reasons why they were undertaken, and the *modus operandi* which was adopted, have already been given in the book of “*Tables of Heights in Sind, the Punjab &c.*” which was published by this Department in 1863; it is unnecessary therefore to say more about them in this place than to describe the progress of the operations which were carried on *pari passu* with the triangulation.

The leveling operations of this season were commenced in the Larkhāna District of Upper Sind, at tower stations whose heights were believed to have been well deduced by the triangulation over the hills from the tidal station of Manora, which is situated at a point

in the harbor of Karáchi, on the north coast of the Indian Ocean; they were carried northwards to Dera Gházi Khán, a distance of 312 miles, over a line which was leveled over independently, station by station, by Major Walker, Lieut. Branfill and Mr. Carty, the mean of the results obtained by the three observers being eventually adopted as the final value. From the station of Márú Pír—the point of origin—as far as Kasmor, the line was carried along the sides of the principal triangles, and the heights of a number of the principal stations were thus determined. From Kasmor up to Dera Gházi Khán it was carried over the main road, for no stations had yet been built in this portion of the series; stone bench-marks were therefore left at suitable intervals for eventual connection with the triangulation.

The principal triangulation in the northern section of the series was executed by

ASSISTANTS.

Mr. N. A. Belletty.  
 „ A. W. Donnelly.  
 „ W. F. Trotter.

Lieutenant Basevi, who succeeded in completing the final triangulation of 2 quadrilateral figures and 4 simple polygons, comprising 32 triangles and extending over a distance of 95 miles. This was an excellent season's work, for Lieutenant Basevi had many difficulties to

contend with; one of his stations was washed away by the river and a new one had to be selected and built and the lines to it cleared, two of them fell down under construction and were re-built, and for a fourth station, which he considered to be injudiciously selected, he substituted another in a more favorable position, which he built at his own cost; he was much delayed for want of the boats which were needed at the many points where he had to cross the river, and eventually he was brought to a stand still by overtaking the operations of the approximate series. Mr. Belletty worked indefatigably, built 19 towers during the field season, and remained in camp during the whole of the following hot season, to construct the remaining stations which were needed to complete this section of the series.

The approximate operations under Mr. Armstrong made fair progress; 14 stations were selected and 12 towers were built by him and his assistant Mr. Ryall, working northwards in advance of Mr. Keelan and closing operations at Kasmor.

The principal triangulation in the southern section was executed by Mr. Keelan, and

ASSISTANT.

Mr. M. C. Hickie.

consisted of one double and two triple polygons, comprising 37 triangles, which brought the operations up to Kasmor, a distance of 106 miles from the point at which

they commenced; azimuth observations were also taken at two stations. This out-turn of work was most creditable to Mr. Keelan, who was much retarded at the outset of his operations by having to clear away the jungle which had grown up on his lines since they were first cut, and subsequently by the difficulties in procuring laborers in the District of Jacobabad, where the principles of free trade had been recently introduced, and laborers were difficult to get, even on high wages, and were ready to walk away at a moment's notice if required to work harder than they thought fit; thus Mr. Keelan reports that forty-four Belúchis took ten days to clear a line of about thirteen miles in length, and he had upwards of twenty such lines to clear under similarly unfavorable circumstances. At the close of the field season Mr. Keelan remained with his party in Camp at Mithankot, in order to supervise the operations for the completion of

the approximate series, which were carried on without intermission throughout the ensuing hot season.

During the field season of 1859-60 Major Walker continued to supervise the whole of the operations on the Indus Series; four parties were employed, two on the principal triangulation and two in executing lines of spirit levels.

Season 1859-60.

As regards the leveling, it had been found necessary that a line should be carried south-wards to Karáchi from the stations in Upper Sind at which operations had been commenced in the previous season and carried northwards to Dera Gházi Khán; for those operations having been connected with the lines of level of the Sind Canal and Railway Departments it was found that the height of the stations in Upper Sind above the mean sea level, as determined by the triangulation from Karáchi, was 28 feet greater than as given by the combined Railway and Canal levels; there was clearly therefore some gross error in one or other of the operations, and this could only be traced to its source by the extension of the Survey levels down to the sea. Colonel Waugh therefore decided that a line of levels should be carried out for this purpose, and at the same time another line from Dera Gházi Khán northwards, to the Chach base-line, near Attock.

Major Walker and Lieutenant Branfill executed the southern line. Commencing at the station of Márú Pír, in the Lárkhána District of Upper Sind, they leveled over the sides of the triangulation down to the station of Mír Khán, where the triangulation from the south may be said to have fairly entered the plains of Upper Sind, to Karáchi. At Mír Khán it was optional for them to proceed either by the route across the hills, or by the river route, *viá* Sehván, Kotri and Tatta. Both were very circuitous, but the former was the shortest by about forty miles; this advantage however would probably have been more than neutralized by the difficulties which would be met with in carrying the operations over hilly ground; on the other hand the river route presented greater facilities for the execution of the operations, and it had the additional advantage of being far more desirable for purposes of general utility, as it would afford opportunities of connecting together various existing lines of canal, levels, and also furnish valuable data for the projection of new canals. The river route was therefore chosen, and the line was carried to Sehván, and thence along the military road which runs parallel to the river as far as Tatta, and then nearly parallel to the coast line, up to Karáchi.

The levels were connected with the southern extremity of the base-line near Karáchi, and they were finally brought to a close on a bench-mark in the harbor of Manora, the height of which, relatively to the mean sea level of the Indian Ocean, had been previously determined by Lieutenant Tennant; it was also the origin of the trigonometrical determinations of the heights of the stations of the Indus Series. The length of line leveled over during the season was 301 miles. The height of Márú Pír, as deduced by the triangulation, was found to be very closely accordant with the value derived from the leveling operations; eventually the discrepancy already noticed between the trigonometrical heights and the corresponding canal levels was ascertained to have been due to an error of sign which had been made in combining several canal lines for the purpose of effecting the requisite com-

parison; after correcting this error, a circuit of upwards of 550 miles in length, formed by the Canal and the Survey levels, closed with a discrepancy of only .11 of an inch.

In the northern section, Mr. Carty and Rámchand, an intelligent Panjábí surveyor, carried a line of levels from Dera Gházi Khan, along the east flank of the triangulation, up to Sandi, the northernmost station in the plains; thence they worked along the main road, *viâ*. Mári and Fathijang, to the Chach Valley, closing on the southern extremity of the base-line near Attock. The length of line which they levelled over was 379 miles, of which fully 100 miles lay in the rugged and difficult ground of the Ráwal Pindi District.

The entire length of the line of levels connecting the Chach base-line with the sea is 989 miles.

The principal triangulation in the northern section was executed, for the most part, by Lieutenant Basevi, aided by Lieutenant H. R. Thuillier and Lieutenant J. Herschel, both of the Bengal Engineers—who had recently joined the Department and were attached to Lieutenant

## ASSISTANTS.

Mr. J. W. Armstrong.  
" G. Ryall.  
" W. F. Trotter.

Basevi's party to learn their duties—and with the assistants named in the margin. Lieutenant Basevi in the first instance selected stations for two polygonal figures at the lower extremity of this section, which were required

to effect the junction with the southern section; he then returned to Dera Gházi Khan and commenced the measurement of the principal angles, and after an arduous season's work completed one double polygon and four hexagons, comprising 30 stations, all towers, and 34 triangles, the whole extending over a distance of 100 miles. These operations terminated at the stations of Ismáil and Gapola—which form the side of junction between the two sections of the series—a few days after Mr. Keelan had taken observations at them to complete the operations of the southern section.

Lieutenants Thuillier and Herschel observed an azimuth of verification at Dájel, while Lieutenant Basevi proceeded to the summit of the Gandahári peak, the highest point at the southern end of the Sulimáni range of mountains, to endeavor to extend the secondary triangulation for fixing the peaks of the hills beyond the frontier; unfortunately the atmosphere suddenly became so thick and hazy that he was unable to reap any results from an expedition which was somewhat hazardous and venturesome.

The principal triangulation of the southern section of the series was executed by Mr.

## ASSISTANTS.

Mr. N. A. Belletty.  
" A. W. Donnelly.  
" M. C. Hickie.

Keelan with the assistants named in the margin. With a view to the early completion of these operations the party had remained in camp at the close of the previous field season, and the greater portion of it was engaged, under Mr. Belletty, throughout the summer of 1859, in

building the requisite tower stations. These operations were however much impeded by the inundations which took place during the periodic rise of the great river; in some instances the materials which had been prepared for the construction of the towers were destroyed, and the work had to be done over again when the river finally subsided. And when the towers were all built and the final observations were commenced, further difficulties were

caused by the prevailing custom of the people of the country to set fire to the dense mass of tall grass, which grows up during the summer months over the whole of the inundated lands, and has to be burnt down to permit of the growth of new grass for pasturage.

The work however was brought to a satisfactory termination, in a manner very creditable to Mr. Keelan. Observations were taken at 22 principal stations, forming 4 hexagonal figures, and extending over a distance of 75 miles, from the initial side of the season's operations up to the side of junction with the northern section of the series. Mr. Keelan, in reporting on the operations of the season, made prominent mention of the zealous and invaluable assistance he had received from Mr. Belletty, who had incurred great exposure in his effort to finish his share of the operations in time for the commencement of the final observations.

On the completion of the calculations of the triangulation it was found that the logarithm of the (true or measured) length of the Chach base-line was less than that of the trigonometrical length, expressed in terms of the Karáchi base-line, by  $\cdot 000,0214$ , or in other words that the ratio of the total error which had been generated in the course of the triangulation, to any given linear distance, was  $= 50 \mu$ ,  $\mu$  being the millionth part of the distance. This error was much larger than any that had been previously met with in the first class principal triangulation of this Survey, as will be seen by the following values\* of the errors generated in certain series of triangles directly connecting base-lines;

in the Great Arc, Dehra Dún to Sironj, length 425 miles,	the error	=	16 $\mu$
"    Sironj to Bider,	"    482    "	=	8    "
in the North-West Himalaya Series,	"    408    "	=	21    "
in the Karáchi Longitudinal Series,	"    672    "	=	23    "
			—
average	"    496    "		17    "
			—

The Indus Series is 747 miles in length, of which about 400 miles are entirely in the plains, where the sides of the triangles are necessarily short, and a much larger amount of triangulation is required, and many more stations of observation, than would suffice for the same distance in a hilly country. Thus this chain of triangles is not only longer but has more links than either of the other chains above specified; and it may therefore be expected to be liable to a larger linear error. Still however the error actually met with was considered to be too large and the work was therefore carefully scrutinized in order if possible to find the cause.

The evidence already afforded by the geometrical equations of condition of the successive polygonal figures forming the triangulation had been exceedingly satisfactory. Thus in analysing the triangular errors—or the differences between the sum of the observed angles of each triangle and  $180^\circ +$  the *spherical excess*—of which there were 228 in all, the average was found to be  $= 0''\cdot 54$ ,

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\* These values of error are taken from the then existing records of the Department; subsequently however the triangulation was reduced by the method of minimum squares, which gave results differing to a slight extent from the preceding determinations; these will be found in volume II.



in 204 cases the error was less than 1"  
 in 23 „ „ greater than 1" but less than 2"  
 in 1 case only „ „ 2", being = 2"·51.

The central and the re-entering errors of the figures were also generally small. Thus a clue was still wanting as to the cause of the closing error of the series.

The sides of the triangles had been computed after the observed angles had been given certain corrections to satisfy the geometrical conditions of the figures to which they respectively appertained, according to a method of successive approximations which was introduced by Colonel Everest. They were now re-computed with the observed angles diminished by  $\frac{1}{3}$ rd of the spherical excess, but without any corrections for geometrical errors; thus whereas in the first computations the value of the side of continuation of each figure would be the same, whether deduced from the triangles on the right or those on the left flank, in the calculations with the uncorrected angles there would be two values, obtained one from each flank; the difference between these values might therefore afford some clue to the cause and possibly to the locus of the error sought after.

Thus in the case of the simple polygon here shown, the ratio of the side of continuation to the side of origin

$$\text{is } \frac{CD}{AB} = \frac{OB}{AB} \cdot \frac{OF}{OB} \cdot \frac{OD}{OF} \cdot \frac{CD}{OD} \text{ by the right flank,}$$

$$\text{and } \frac{CD}{AB} = \frac{OA}{AB} \cdot \frac{OE}{OA} \cdot \frac{OC}{OE} \cdot \frac{CD}{OC} \text{ by the left flank;}$$

and if the right and the left hand angles at each of the external stations are respectively indicated by  $r$  and  $l$ , and the central angles opposite  $AB$  and  $CD$  by  $O_1$  and  $O_2$

$$\text{then } \frac{CD}{AB} = \frac{\sin O_2 \cdot \sin A_r \cdot \sin B_r \cdot \sin F_r}{\sin O_1 \cdot \sin F_l \cdot \sin D_l \cdot \sin C_l} \text{ by the right flank,}$$

$$\text{and } \frac{CD}{AB} = \frac{\sin O_2 \cdot \sin B_l \cdot \sin A_l \cdot \sin E_l}{\sin O_1 \cdot \sin E_r \cdot \sin C_r \cdot \sin D_r} \text{ by the left flank;}$$

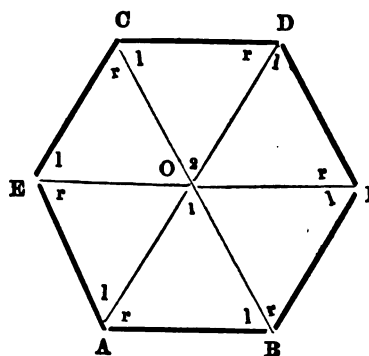
thus two values of the ratio are obtained for comparison, in the first of which right hand angles form the numerator and left hand angles the denominator of the ratio, while in the second the converse takes place.

Similarly in a quadrilateral figure  $ABDC$  we have

$$\frac{CD}{AB} = \frac{CD}{BD} \cdot \frac{BD}{AB} = \frac{\sin A_r \cdot \sin B_r}{\sin D_l \cdot \sin C_l} \text{ by the right flank,}$$

$$\text{and } \frac{CD}{AB} = \frac{CD}{AC} \cdot \frac{AC}{AB} = \frac{\sin B_l \cdot \sin A_l}{\sin C_r \cdot \sin D_r} \text{ by the left flank.}$$

From such calculations the ratios of the linear differences to the linear magnitudes, as obtained from the triangles respectively on the right and the left flank of the series, have been computed for the side of continuation of each figure in succession, from the Karáchi base-line upwards. They are given in the following table, and also the corresponding ratios of the differences between the results by the right flank and those by either flank, after correcting all the



angles for the geometrical errors of the figures to which they appertain; the table also specifies the theodolite employed for each figure, the minimum number of measures of an angle taken with it, and the names of the successive figures; the nature of each figure is indicated by the symbol Q for quadrilaterals—figures with four triangles, P for simple polygons—with five or six triangles, 2 P for polygons of two centres and eight to ten triangles, and 3 P for two polygons of three centres and fourteen triangles.

FIGURE.		Theodolite employed.	Minimum number of measures of any angle.	RIGHT—LEFT		RIGHT—CORRECTED	
Names.	Nature			For each figure.	Cumulative.	For each figure.	Cumulative.
Karachi base-line ... ..	...			+ 12.2μ	+ 12.2μ	+ 8.1μ	+ 8.1μ
Ghati-Maihar ... ..	...			- 3.0	9.2	- 3.7	4.4
Khato-Tikka ... ..	...			- 0.9	8.3	- 0.5	3.9
Andar-Bhit ... ..	...			- 0.5	7.8	- 0.7	3.2
Bulimani-Mir Khan ... ..	...			+ 5.8	13.6	+ 1.8	5.0
Lali-Hairo ... ..	...			- 1.6	12.0	- 0.7	4.3
Chathe-Mir-ka-Kuba ... ..	...			+ 0.5	12.5	- 0.5	3.8
Kharbi-Sabar Khan ... ..	...			+ 1.8	14.3	+ 0.2	4.0
Mojahar-Maru Pir ... ..	...			+ 1.2	15.5	+ 0.9	4.9
Karoahar ... ..	...			+ 4.1	19.6	+ 1.8	6.7
Lakha ... ..	...			+ 3.0	22.6	+ 1.4	8.1
Damraba-Mangi ... ..	...			+ 5.5	28.1	+ 3.5	11.6
Mari-Hatidara-Jangal pahora ... ..	...			+ 13.8	41.9	+ 8.5	20.1
Kandkot-Khaf-Mula Amad ... ..	...			+ 16.3	58.2	+ 10.4	30.5
Shawalf ... ..	...			+ 32.0	90.2	+ 17.0	47.5
Biwari ... ..	...			+ 5.1	95.3	+ 1.4	48.9
Kahiri ... ..	...			+ 9.7	105.0	+ 5.3	54.2
Dago ... ..	...			+ 3.0	108.0	+ 1.8	56.0
Gangah ... ..	...			- 2.8	105.2	- 0.9	55.1
Kambar Shah ... ..	...			+ 5.5	110.7	+ 3.5	58.6
Jhakar ... ..	...			- 4.6	106.1	- 2.8	55.8
Dalura ... ..	...			- 5.5	100.6	- 3.2	52.6
Mohana-Nasichand ... ..	...			+ 4.8	105.4	+ 1.2	53.8
Turi ... ..	...			- 1.8	103.6	+ 0.5	54.3
Aliani ... ..	...			+ 5.1	108.7	+ 2.3	56.6
Rakwa ... ..	...			+ 10.1	118.8	+ 5.1	61.7
Barmi ... ..	...			+ 5.8	124.6	+ 4.6	66.3
Rhoda-Sagra ... ..	...			- 8.3	116.3	- 5.5	60.8
Muriali-Ahmad Sindi ... ..	...			- 1.6	114.7	- 0.5	60.3
Sandi-Umarkhel* ... ..	...			+ 6.4	121.1	+ 1.4	61.7
Pari-Taman ... ..	...			+ 32.2	153.3	+ 12.7	74.4
Chach base-line ... ..	...			+ 3.9	157.2	+ 0.2	74.6

It will be seen from the preceding table that there is a remarkable tendency for a continuous divergence between the results on the right and those on the left flank, amounting eventually to 157.2 μ; and it will be further noticed that this divergence is very much more marked in the polygonal figures measured with Colonel Waugh's 24-inch Theodolite No. 2, than in those with Troughton and Simm's 36-inch Theodolite, though the amount of triangulation done with the former instrument was only about two thirds of that by the latter; thus for the work with the 36-inch Theodolite, at 95 stations, R—L=35.7 μ. while for that with the 24-inch Theodolite, at 63 stations, R—L=121.5 μ. Moreover in two figures done with the 24 inch instrument the divergence was 32 μ and 32.2 μ,

\* A few angles in this figure were measured with a 24-inch Theodolite by Troughton and Simms, the same number of measures being taken as with the 36-inch.

or nearly equal, in each instance, to the whole amount of the divergency generated in the operations with the 36-inch instrument.

The two figures in question were the double polygon of Pari-Taman in the northern section and the Sháwálí polygon in the southern. On Major Walker's recommendation Colonel Waugh decided that they should be revised with the 36-inch theodolite. The revision was

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carried out in the following field season by Lieutenants Herschel and Thuillier, who commenced at the northern figure—which they completed very speedily—and then proceeded to the southern figure; this however gave more trouble; the station of Kúndri, on the side of junction with the Riwárí polygon, had been washed away by the river, and it was necessary to build a new station and also to take the observations which were required to connect it with the contiguous stations of both polygons.

On the completion of these operations Lieutenant Thuillier proceeded to join the Kashmir Survey, while Lieutenant Herschel commenced the chain of triangles which is known as the Sutlej Series. The new triangulation emanated from the side Sháhpúr-Lanjiwár of the Gola polygon of the Indus Series, and was afterwards connected with the side Lanjiwár-Tárú of the same polygon; in consequence of this circumstance the first four triangles of the Sutlej Series and the Kahírí, Gola and Dago polygons of the Indus were converted into a composite net-work of triangles, forming a polygonal figure with four centres; as it would be ultimately necessary to reduce the whole of this triangulation simultaneously, the details of the observations and reductions of the portion which was originally intended for the Sutlej Series only have been treated as appertaining to the Indus Series and are given in the records thereof. These operations completed the triangulation of the Indus Series.

As regards the linear errors which were generated in the course of the triangulation, it is necessary to examine, first, the cumulative differences between the results of the triangles on the right and the left flanks of the series, and secondly the absolute error, which is shown by the excess of the computed over the measured length of the verificatory base-line at the northern extremity of the series.

On referring to the geometrical equations at page XIII—D it will be immediately seen that the cumulative excess by the right flank, as compared with the left, points to a preponderance of *positive* errors in the right hand angles at the several stations of observation (on *both* flanks) and of *negative* errors in the left hand angles. Now it happens to have been an invariable custom of the observers, when operating at the flank stations of this series, to adjust the microscopes to the successive zero or setting readings of the azimuthal circle when the telescope was pointing to the left hand object. Thus all the observations to the reference station are liable to constant errors of two kinds; first the mean graduation error of the fifty equidistant divisions of the circle, commencing at  $0^{\circ}$ ; and secondly the errors arising from the presence of irregularities in the bearing surfaces of the vertical axis and its socket, which would have a tendency to be constant, as the same points are always opposed to each other when the circle settings are the same. On an average about one-half the left hand

angles at the stations on each flank are what may be called zero-angles, and they would contain these constant errors, and it may be readily supposed that the constant recurrence of even very minute errors would produce a divergence of the nature in question.

In the triangulation with Colonel Waugh's 24-inch theodolite there are twenty-three zero-angles on the left and twenty-seven on the right flank, or fifty in all, and if to obtain a rough approximation to the magnitude of the zero error, we assume that the divergency of  $121.5 \mu$  is due to it only, all other errors having cancelled each other, and if we put  $d\theta$  for this error, we obtain the following equation,

$$\begin{aligned} d\theta \times \text{sum of cotangents of zero-angles} &= - 121,5 \mu \\ \text{whence } 32.7 d\theta &= - .000,121,5 \\ \text{and } d\theta &= - 0''.77. \end{aligned}$$

Additional evidence may be brought to bear on this subject by comparing the values of the angles originally measured with the 24-inch theodolite, as zero-angles, with the values which were afterwards obtained with the 36-inch theodolite, when the zero was generally set to the right hand object and never to the same object as in the first measurement. There are fourteen cases in which the 24-inch theodolite gives a value less on an average by  $1''.22$  than the 36-inch, and four cases, averaging  $0''.63$ , in which the value is greater; hence therefore as the mean of the angles by the larger instrument probably does not contain constant errors, the mean algebraical difference between the results by the two instruments may be taken as a fair measure of the zero error of the smaller instrument;

$$\text{whence } d\theta = - 0''.81.$$

On making a comparison of the results by the right and the left hand flanks of the Rahún Series—the whole of which was also done with Colonel Waugh's 24-inch theodolite No. 1—it has been found that the values of R—L accumulate to  $68.4 \mu$ , and are positive in fifteen out of the nineteen figures forming the series; there are seventy-four zero-angles in this triangulation, and as it is exceedingly symmetrical, the sum of the cotangents may be considered =  $74 \times \cotangent 60^\circ$ ; hence assuming the cancelment of all other errors than those of the zero-angles, as in the previous instance,

$$\frac{74}{\sqrt{3}} d\theta = - 000,068,4$$

$$\text{whence } d\theta = - 0''.33.$$

Though the value of  $d\theta$  thus obtained is materially less than in the previous instance, it has the same sign. On the whole there seems much probability that there is a sensible constant error in all angles measured from the usually adopted zero points of this instrument, and that the sign of this error is negative for measures from the zero points to the right, and positive in the opposite direction.

With the 36-inch theodolite there is a trace of a similar error, but one of far smaller magnitude; thus we have from the table at page XIV—D and from a corresponding calculation for the Karáchi Longitudinal Series, an accumulative value of R—L =  $35.7 \mu + 16.2 \mu = 51.9 \mu$ , obtained from fifty-one figures in all, in twenty-two of which R—L has a negative

sign. As there are in all 180 zero-angles, we may put

$$\frac{180}{\sqrt{3}} d\theta = - \cdot 000,051,9$$

whence  $d\theta = - 0''\cdot 10$ .

Thus there is not only an *a priori* possibility of the presence of constant errors—the influence of which would become accumulative, because of the custom which had been almost invariably adopted of setting the instruments to their zero-points on the left hand objects, at the stations of observation—but there is the evidence of facts, collected from a very large number of observations, that such errors are actually present. Consequently Colonel Waugh issued a Departmental Order, on the 29th October 1860, directing the following modifications of the then existing procedure ;

*First.* In order to produce a larger amount of change in the position of the vertical axis relatively to its socket, the zero-settings were to be determined in future by adding the arc between the microscopes, to the arc ( $= 360^\circ \div$  the product of the number of microscopes by the number of changes of zero) which defines the equidistant points on the circle to which readings are taken in the course of the observations. Thus in a theodolite with five microscopes, when the measures are made with ten zero-settings, the arc between the circle-readings is  $7^\circ 12'$ , and the zero-settings originally were  $0^\circ$  and  $180^\circ$ ,  $7^\circ 12'$  and  $187^\circ 12'$  and so on up to  $28^\circ 48'$  and  $208^\circ 48'$ ; adding  $72^\circ$ —the arc between the microscopes—to the second,  $2 \times 72^\circ$  to the third pair of settings, and so on, the new settings become  $0^\circ$  and  $180^\circ$ ,  $79^\circ 12'$  and  $259^\circ 12'$ , and so on up to  $316^\circ 48'$  and  $136^\circ 48'$ : thus the same graduations of the circle are read as formerly, but the order in which they are brought under the microscopes is altered, and the position of the axis of the instrument in its socket is materially varied.

*Secondly.* To prevent the accumulation of constant errors in the graduations brought under the microscopes at the zero-settings, it was directed that the telescope should be set to zero alternately on the left and the right hand objects, at the successive stations of observation, whereby the influence of such errors would be eliminated.

It is now necessary to examine the linear error which was generated in the triangulation, and is exhibited by the excess of  $50 \mu$  in the trigonometrical length of the Chach base—computed from the Karáchi base—over the measured length of the Chach base. The trigonometrical length was obtained, as already stated, after the observed angles had been corrected for the geometrical errors of the figures to which they respectively appertain; this length will therefore be the same whether computed through the right or the left flank, and it may be called the *corrected* length, in contra-distinction to the lengths which are indicated by the two flanks when the *uncorrected* angles are used. In the table at page XIV—D the single and the cumulative values of “Right—Corrected” are given in succession, as well as those of “Right—Left.” For the final results at the Chach base-line we have

$$\begin{aligned} \text{Right—Corrected} &= 74\cdot 6 \mu \\ \text{Right—Left} &= 157\cdot 2 \mu \\ \text{but Corrected} &= \text{Measured} + 50 \mu \\ \text{therefore Right} &= \text{Measured} + 124\cdot 6 \mu \\ \text{and Left} &= \text{Measured} - 32\cdot 6 \mu \end{aligned}$$

It is thus clear that a much smaller amount of *linear*\* error was generated in the triangles on the left or west flank of the series than in those on the right or east flank; and this may be accounted for by the constant errors of the zero-angles tending to cancel other errors on the left and to augment them on the right flank. But though these constant errors may materially affect chains of single triangles, they cannot sensibly influence polygonal figures, for the effect on one flank tends to cancel that on the other, as is evident from the geometrical equations at page XIII—D.

By the revisionary operations with the 36-inch theodolite the length of the northern side of the Pari-Taman polygon, as deduced from the southern side, was  $10\cdot1 \mu$  less than the corresponding value by the 24-inch theodolite. No comparison could be made at the Sháwálí polygon, as the Kúndrí station on its northern side had been carried away; the revised values of the common sides of this and the Riwárí polygon range from  $7\cdot8 \mu$  to  $4\cdot6 \mu$  in excess of the original values, the eventual effect on the northern side of the latter figure being  $1\cdot2 \mu$  in excess. That the largest difference was met with in the Pari-Taman polygon may be in some measure due to the circumstance that Mr. Logan had only made twenty measures of each angle, whereas Mr. Keelan, using the same instrument in the southern section, had made thirty measures; but this is questionable, for it will be seen presently that the theoretical errors of the angles are the same in both sections.

It may be here added that after the recomputation of the triangulation of the Indus Series by the method of minimum squares, the results of which are given in this volume, and the final reduction of the Karáchi and the Chach base-lines, as given in Volume I, the linear error generated in the triangulation was found to be reduced from  $50\mu$  to  $37\mu$ . For a comparison of this error with the theoretical probable error of the triangulation, and for further remarks on the practical errors of the operations, the chapter which will be devoted to this subject in Volume II should be consulted.

As instances of revision in any of the principal operations of this Survey are very rare, a table showing the two sets of results which were obtained, and their differences, is here given. Eventually it was decided to retain both the original and the revised values, combining them with their respective weights, which are also shown in the accompanying table, as they were inadvertently omitted from the printed record of the Observed Angles, which only gives the weights of the combined—or, as they have been called, the Concluded—Angles. The differences between the concluded results and the individual results by each instrument are evidently a fair measure of the theoretical errors of the observations, so that if we put

$$\text{the } e. m. s. = \sqrt{\frac{\text{sum of squares of differences}}{\text{their number}}}$$

we shall find the value of the *e. m. s.* of an angle, measured according to the system of procedure which has been adopted, to be

$$\begin{aligned} &\pm 0''\cdot44 \text{ for the 36-inch theodolite,} \\ &\text{and } \pm 0''\cdot66 \text{ for the 24-inch theodolite,} \end{aligned}$$

\* No attempt has been made to ascertain the amount of the *Azimuthal* errors which have been generated on the two flanks, for such an investigation would rest on the accuracy of azimuths determined from astronomical observations, but these are liable to be so largely influenced by local attractions that they could not be depended on for the purpose.

as deduced in each instance from the whole of the observations. If those by the 24-inch instrument are divided into two groups, one for the southern and the other for the northern section, the respective results,  $\pm 0''\cdot67$  and  $0''\cdot65$ , are practically identical with each other, which shows that with only twenty measures of an angle at the hill stations on the north, as good results appear to have been obtained as with thirty measures in the plains to the south, as is very possible, for observations are usually taken under much more favorable circumstances on hills than in the plains.

*TABULAR Statement of the seconds and the weights of certain angles measured independently with Troughton and Simms' 36-inch Theodolite, and with Colonel Waugh's 24-inch No. 1, showing also the Concluded Results, and the differences of the original values from them.*

Stations			36-inch		24-inch		Concluded Results = C	Differences	
			Seconds	Weight	Seconds	Weight		C-36-inch.	C-24-inch.
			"		"		"	"	"
LVIII,	LIV,	LVI.	44'36	9'46	43'01	10'00	43'67	- '69	+ '66
LVI,	LV,	LVII.	50'77	7'30	50'29	6'72	50'54	- '23	+ '25
LIX,	LVI,	LVII.	39'54	11'94	39'85	3'74	39'61	+ '07	- '24
LVII,	LVI,	LV.	13'56	9'17	14'28	7'40	13'88	+ '32	- '40
LIV,	LVI,	LVIII.	2'40	7'42	3'31	9'82	2'92	+ '52	- '39
LVIII,	LVI,	LIX.	2'29	13'13	1'11	4'13	2'01	- '28	+ '90
LV,	LVII,	LVI.	56'53	11'04	56'47	13'53	56'50	- '03	+ '03
LVI,	LVII,	LIX.	2'61	5'34	2'69	4'00	2'64	+ '03	- '05
LXI,	LVIII,	LX.	54'01	11'58	51'95	9'55	53'08	- '93	+ 1'13
LX,	LVIII,	LIX.	35'86	5'31	36'20	17'50	36'12	+ '26	- '08
LIX,	LVIII,	LVI.	41'87	7'63	41'46	16'32	41'59	- '28	+ '13
LVI,	LVIII,	LIV.	13'53	7'70	14'84	8'35	14'21	+ '68	- '63
LVII,	LIX,	LVI.	18'79	5'72	17'38	6'26	18'05	- '74	+ '67
LVIII,	LIX,	LX.	43'09	10'04	42'67	13'70	42'85	- '24	+ '18
LX,	LIX,	LXII.	24'36	5'26	25'72	4'73	25'00	+ '64	- '72
LXI,	LX,	LXIII.	60'04	10'05	58'66	21'14	59'10	- '94	+ '44
LXII,	LX,	LIX.	41'12	5'86	40'10	10'62	40'46	- '66	+ '36
LIX,	LX,	LVIII.	41'08	5'90	41'19	6'98	41'14	+ '06	- '05
LVIII,	LX,	LXI.	15'55	11'09	16'80	10'16	16'14	+ '59	- '66
LXIII,	LXI,	LX.	54'79	16'10	52'73	5'98	54'23	- '56	+ 1'50
LX,	LXI,	LVIII.	51'39	13'90	51'38	14'42	51'38	- '01	'00
LIX,	LXII	LX.	55'28	7'24	54'87	6'56	55'09	- '19	+ '22
LX,	LXIII	LXI.	5'51	10'56	7'83	4'14	6'16	+ '65	- 1'67
CXLV,	CXLIII,	CXLIV.	27'26	16'48	28'71	4'00	27'54	+ '28	- 1'17
CXLIII,	CXLIV,	CXLV.	14'79	13'56	13'55	9'07	14'29	- '50	+ '74
CXLV,	CXLIV,	CXLVII.	55'79	18'08	56'32	10'05	55'94	+ '15	- '38
CXLVIII,	CXLV,	CXLVII.	23'09	10'58	22'29	4'30	22'86	- '23	+ '57
CXLVI,	CXLV,	CXLVIII.	22'72	10'08	22'78	3'00	22'73	+ '01	- '05
(XVII),	CXLVI,	CXLVIII.	38'88	21'91	39'41	13'20	39'08	+ '20	- '33
CXLV,	CXLVI,	CXLIII.	37'03	8'86	36'95	8'02	36'99	- '04	+ '04
CXLIV,	CXLVII,	CXLV.	27'24	17'40	25'25	7'30	26'65	- '59	+ 1'40
CXLVIII,	CXLVII,	CXLIX.	35'53	20'00	35'93	13'20	35'68	+ '15	- '25
(XIX),	CXLVIII,	CXLIX.	27'64	21'16	28'09	4'02	27'71	+ '07	- '38
CXLVI,	CXLVIII,	(XVII).	38'58	10'34	38'32	7'60	38'47	- '11	+ '15
(XVII),	CXLVIII,	(XIX).	52'18	14'96	53'08	6'50	52'45	+ '27	- '63

## SECONDARY TRIANGULATION.

It has been found convenient to incorporate with the records of the Great Indus Series the details of all the secondary triangulation which has been executed by this Department to the west of the River Indus, whether done as a part of the operations of this Series or not; on the other hand a portion of the secondary triangulation of this Series will be incorporated with the details of the Sutlej Series. These arrangements will also be more convenient for future reference than if the results of the several operations, which are sometimes much interlaced, were published separately.

1. *The Northern Trans-Indus Frontier Survey.*

On the termination of the Panjáb Campaign, in 1848-49, Brigadier-General Dundas, now Lord Melville, authorized Lieutenant J. T. Walker, of the Bombay Engineers, to undertake a Military Survey of the country in the vicinity of the City of Pesháwar. It was commenced in April 1849, by the measurement of a base-line with a common chain, and triangulation therefrom; for as yet the operations of the Great Trigonometrical Survey—which are so valuable in furnishing initial elements for new surveys—had not reached the frontier of territories which had only been recently acquired by the British Government.

The country first surveyed was that lying to the west of the road running from the Fort of Shabkadr, through Pesháwar, to the mouth of the Kohát Pass, which is of much importance from a military point of view, because it commands all the passes leading from the Pesháwar Valley into Afghanistan, and is contiguous to the most troublesome hill tribes on the frontier.

With the aid and escort of some friendly chieftains, the Arbábs of Thákál, Lieutenant Walker succeeded in ascending to the summit of the Tártarra Mountain,\* which overlooks the famous Khyber Pass; but unfortunately the weather was hazy, and but a small portion was visible of the wide extent of country which can be seen from this mountain when the atmosphere is favorable. This however was the only point on the hill ranges west of Pesháwar which Lieutenant Walker was ever able to ascend; nowhere else could he even reach the foot of the hills, being opposed at all points by men of the hill tribes, who, whenever met with, were always found armed to the teeth, even when ploughing their fields or cutting their crops. In those days his escort merely consisted of a couple of sowars, one of whom usually carried a small theodolite and the other a folding tripod-stand; all he could do was to go on until shot at, and then return; and this he did on several occasions, until advised by Colonel G. St. Patrick Lawrence, the Commissioner of Pesháwar, that it was not desirable. A dotted line on his original map shows the line beyond which "further proceedings were stopped by the hostility of the natives."

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\* Lieutenant Walker was accompanied on this occasion by Lieutenant—now Colonel Sir William—Merewether, Lieutenant—now Major-General Sir Henry—Green, Lieutenant—now Colonel—Conybeare, and other officers whose names he cannot now recall.



In those days too Lieutenant Walker was a young and inexperienced surveyor, not long arrived from the Royal Engineer School at Chatham, where the little that was taught on surveying had little bearing on such a survey as the one he was now called on to execute. The hills which he was not able to visit he sketched as best he could from the nearest points to which he had access. He had not then learnt the advantages of the system which he afterwards adopted—and which is practised with great success in operations of a similar nature by the officers of the Great Trigonometrical Survey—of fixing *all* the principal features of an inaccessible range of hills by observations, with theodolites, from a series of stations so close to each other as to enable the several points of observation to be easily identified from at least three stations, whereby, though the subtended angles may be very small, the results are self-verify and fairly accurate, and any error of identification or measurement is immediately shown up. His stations were so far apart that only some of the most striking features could be identified from them; and thus it came to pass that many points of importance—the fixing of which would have greatly added to the accuracy of his sketches—were omitted altogether; twenty years afterwards however these omissions were rectified, when Captain Carter executed the triangulation of which an account will be given further on.

In the operations of his first field season Lieutenant Walker was assisted by Lieut. H. Garnett of the Bengal Engineers, an officer of much ability, who was shortly afterwards removed to other duties, to the great loss of the survey on which he had been employed. He was succeeded by Lieutenant Allom, of the Bombay Artillery, who had only been a few days at work when he died very suddenly, and the Government lost the services of a deserving young officer, whose intelligence and zeal had given much promise of future success. No other officer was appointed to the survey.

In December 1849 Lieutenant Walker served as Field Engineer with the force under Colonel Bradshaw, which was sent to subdue certain villages in the Lúndkhwar valley, on the northern border of Yúsofzai; he was present in the attacks on the villages of Sagow, Palli and Zormandi, after which he commenced a survey of the Lúndkhwar valley, measuring a chain-base-line for the purpose, which eventually served as a base of verification for the triangulation from Pesháwar. While thus engaged he was suddenly recalled to accompany the column under Sir Charles Napier which was proceeding against the tribes in the Kohát Pass, and he made a route-survey of the pass, which he eventually connected with the general survey of the Frontier. And subsequently he accompanied the expeditions under Sir Colin Campbell against Prángzai and Ránízai, and Colonel Boileau's expedition against Bori, each of which afforded opportunities of acquiring additional information of the topography of the country beyond the Frontier.

All accessible points on the line of hills which forms the boundary between the British territories and the countries held by independent tribes were visited, and thus much geographical information was acquired of regions which no European has even yet entered, unless when accompanying a military expedition. In these operations Lieutenant Walker was much aided by the inhabitants of the border villages subject to the British Government; they turned out in force to guard him whenever required to do so, they knew the points he could

visit without much risk, and his safety was always ensured by their presence. On one occasion he was materially assisted by the Khan of Mír-Alli, who—finding that he had been baffled in his attempts to get on the hill range commanding the valleys of Búnér and Chamla, by the vigilance of the inhabitants, who were much excited and had placed guards on the principal passes leading into the range—recommended him to move away to a distance until the excitement should subside and the guards be withdrawn, and promised that he would then escort him to the summit of a peak from which he would obtain a good view of both those valleys. The Khan was as good as his word; a month afterwards he collected together a number of his armed followers, and escorted Lieutenant Walker to the summit of a peak above the village of Lálú, which ten years afterwards was the scene of severe and long protracted fighting between the British Troops under Sir Neville Chamberlain and the Independent Hill Tribes, during the Ambeyla Campaign. Lieutenant Walker started at night fall from Mír-Alli with his escort, and marching *viá* Sherdarra and Khánpúr reached the village of Lálú a little before the following dawn; he proceeded to the summit of the peak above, while his escort guarded all the roads leading out of the village and prevented any one from issuing out of it. The surprise was complete and most successful. Eventually however an alarm was raised in the contiguous villages of the valley of Chamla, but before the hill men could collect in sufficient force to be dangerous, the necessary observations and sketches had been taken, and Lieutenant Walker returned with his escort to Khánpúr without molestation. The results of this expedition, when combined with Lieutenant Walker's observations on the Paja peak of the Sináwar mountain to the west, and with observations by a native surveyor on the Sarpatti mountain to the east, afforded the means of making a very respectable map of Búnér and Chamla. This was the most successful of any of Lieutenant Walker's expeditions on the border. Shortly afterwards he was planning a similar expedition to the summit of the Máhában mountain—the supposed site of the ancient Aornos—when he was officially informed that if he got into any trouble he would be tried by Court-Martial, and consequently he had to abstain from doing what might have got him into trouble.

By the end of the year 1851, Lieutenant Walker had completed the survey of the Pesháwar Valley, including the country of Yúsofzai; the operations embraced an area of 3,100 square miles of which a fair first survey had been made on a trigonometrical basis; the theodolite was used at 111 stations, of which 90 appertained to the general net-work, and the remainder were subsidiary, for the topography; whenever practicable the stations were marked by cairns of stones or by earthen pillars, but sometimes trees and the centres of elevated mounds had to be used instead. A third chain-base was measured for the verification of the triangulation; it is situated to the west of the River Indus, and is nearly parallel to the Chach base-line of the Great Survey, which was measured subsequently in 1853-54; the ends of the two bases being mutually visible were eventually connected together by triangulation. In 1852, several of the stations were connected with the Great Triangulation, and Lieutenant Walker never had occasion to measure any more verificatory bases, for as his work proceeded he was able to combine his operations with those of the Great Indus Series.

On the completion of the Pesháwar Valley it was the wish of Sir Henry Lawrence, the President of the Panjáb Board of Administration, that Lieutenant Walker's operations

should be extended southwards, through as much of the Khattak hills and the districts of Kohát and Bannú as the District Officers might consider safe and practicable. But on referring the matter for the orders of the Governor General, Lord Dalhousie, a reply was received from which the following passage is extracted ;

“His Lordship deprecates the extension of the survey into the Khattak country, or at all events into the northern portion of it. He doubts the possibility of the Local Officers being able to judge correctly of the safety of the survey duty. It is one obviously likely to create unreasonable suspicion among the mountaineers, and to lead to violence which must embroil us with the whole of the mountain tribes.”

Eventually His Lordship, admitting the importance of a survey of the Khattak hills to be unquestionable, assented to it, though with much reluctance; and subsequently when solicited to give Lieutenant Walker some assistants, he declined, on the grounds that he did not think minute details were necessary, nor did he “wish to increase the risks of the task by multiplying the duties.”

In 1852, Lieutenant Walker was placed under the orders of the Surveyor General, Colonel Waugh, in order the better to ensure the combination of his work with the Topographical Survey of India. From this time his observations were made and reduced as closely in accordance with the system of the regular survey as the peculiar nature and difficulties of the operations would permit of. The latitudes and longitudes of all the stations were calculated on the basis of initial elements supplied by the Great Indus Series, and meridians and parallels of latitudes were duly projected on the maps. The quality of the triangulation was much improved; for hitherto Lieutenant Walker had only been furnished with a 3½ inch theodolite with two verniers, and he had rarely made more than two measures of each angle; now he was supplied by Colonel Waugh with a 7-inch theodolite, with three verniers, better graduated and of higher telescopic power, and he adopted the rigorous system of measures at a number of equidistant points of the circle, observing all the principal angles on four pairs of zeros. Substantial cairns of stones were erected, whenever practicable, to preserve the trigonometrical stations for future reference. The field-sketching was done on drawing paper in rolls four feet long by nearly three in breadth, mounted on brown holland cloth; they were set up for work on a light board, only a foot square, which was supported by a folding tripod-stand; the portion of the paper required at each sketching station was pinned over the board and the rest was allowed to hang down; thus the inconvenience of using small sheets of paper was avoided, and great portability was secured with a surface of paper, more than double that of the plane tables of the regular survey. The details of the ground were almost invariably inked in, shaded and colored on the spot. A native surveyor, Mirza Sújah—who was afterwards employed as a Trans-Himalayan explorer—traversed the principal roads and rivers, starting from and closing on the stations of the survey; but, with this exception, all topographical details were laid down by Lieutenant Walker, by eye-sketching from the trigonometrical stations and from points interpolated between them.

The course of the British Boundary-line to the south of the Pesháwar Valley is so tortuous and winding, stretching sometimes far to the west and then retrogressing eastwards,

that many places were connected by a length of triangulation far exceeding their direct distances. Thus between the valleys of Pesháwar and Kohát there is a belt of hills, occupied by an independent tribe of Affrídís, which stretches eastwards to within a few miles of the Indus, and though the towns after which the valleys are named are only 30 miles apart, the length of the triangulation connecting them was 150 miles. Again Kohát and Bannú are only 64 miles apart, but they are separated by hills of which portions appertain to an independent tribe of the Wazírís, and the connecting triangulation was 180 miles in length.

From the four westernmost stations of the triangulation—which are situated to the north of the Fort of Bahádúr-Khel—a large amount of triangulation was executed, which fixed the most conspicuous peaks of the Safed Koh—the range of mountains which forms the southern boundary of the Jelálabád Valley—and all the prominent points on the hills beyond the Frontier. These four stations formed a quadrilateral figure which gave always two and sometimes as many as six bases for the determination of the hill peaks; as the distances ranged from 20 to 100 miles the subtended angles were sometimes very small, and the differences between the values of common sides was usually 100 to 1,000 feet; but in three or four instances, when the points observed were very indistinct and difficult to recognise, the differences were as much as a mile.

By the end of the field season of 1852-53, Lieutenant Walker had completed his

<i>Pesháwar proper.</i>	<i>Square Miles.</i>
Hashtnagar ... ..	396
Doaba ... ..	96
Lower Momand ... ..	195
Khalíl ... ..	108
Dá-údzai ... ..	89
Khálsa ... ..	181
	1,015
Yúsofzai ... ..	960
Akora Khattak ... ..	685
Tírí Khattak ... ..	1,657
Bangash ... ..	719
Ságrí ... ..	140
Bangí-Khel ... ..	185
Bannú ... ..	308
Marwat ... ..	1,195
Kálabágh and Isa-Khel ... ..	415
Khasor ... ..	173
Deraját, north of the latitude of Dera Ismáíl Khan	1,309
Total Area in square miles	8,761

survey of the whole of the British territories west of the Indus, from Pesháwar down to the parallel of Dera Ismáíl Khan, covering an area of upwards of 8,700 square miles, the sub-divisions of which are approximately shewn in the margin; he had also acquired a fair amount of geographical information of 11,000 square miles of border-country, occupied by Yághi, or Independent, Hill Tribes. Some of the triangulation on which his survey was based has become obsolete and is now of no further value, but the data of 63 of his principal and 74 of his secondary stations, as well as of 74 intersected points—mostly hill peaks beyond the frontier—have been incorporated with the secondary results of the Great Indus Series, as they may be of future use.

Further details of Lieutenant Walker's operations will be found in his paper entitled "*Some Account of the Survey of the Northern Trans-Indus Frontier, from Peshawar to Dehra Ismail Khan,*" which is published in volume 11 of "*Selections from the Public Correspondence of the Punjab Administration, 1855.*" This paper indicates the nature of the work performed in the successive stages of the operations, from the commencement to the close of the survey, and it shews what amount of accuracy may be expected in different parts, some portions having been performed under far greater difficulties—political as well as physical—and much more hurriedly, than other portions.

This account of the operations may fitly close with the following extract from Lieutenant Walker's paper, which is on the subject of the general accuracy of the topography.

“ With regard to general correctness, the map must not be supposed to be perfect ; the means available did not warrant an attempt to achieve that accurate delineation of subordinate features, which can only be attained by elaborate and systematic operations, requiring large establishments and ample resources of every kind. Any individual attempting, single handed, to execute a survey of ten thousand square miles of country, must either give little detail and work quickly, or if accurate topography be his object, he must be prepared to spend a whole life-time on his task. By a law of mechanical science what is gained in time is lost in power ; and so it is in surveying, the relation between intrinsic value and rapid execution is comprised within narrow limits, and the ablest of men are physically incompetent to achieve much more than those who to moderate ability join moderate perseverance. The present operations have occupied only four and a half years, giving an average of upwards of two thousand square miles per annum, inclusive of every thing, from the first measurements in the field, to the completion of the fair copy Maps for the Surveyor General. All therefore that could be done, after the villages and chief points had been determined with accuracy, was to sketch minor features from the summits of commanding positions. Very rarely indeed, perhaps not once in twenty cases, was a ravine followed throughout its whole course ; all that could be done in a country, whose intricacy is perhaps rarely surpassed, was to fix ravines in different parts of their course, without attempting to follow each in detail, which would have been a never-ending undertaking. But to distinguish either one of these after having lost sight of it for some time, from another, was no easy matter. To do so it was necessary either to resort to native information, which might be erroneous, or to decide personally from a bird's-eye view, which might be deceptive. Consequently it is to be expected, that there may be instances in which the course of minor ravines has, by mistake, been shewn inaccurately ; certainty could only be ensured by following each in detail from end to end, which was impossible. \* \* \* \* \*

“ Herein will be found an additional value of the triangulation on which these operations have been based, that it will enable all new information, collected in the course of special surveys, to be easily incorporated into new editions of the general map.”

## 2. *The secondary triangulation to Pesháwar, in continuation of the North-West Himalaya Series.*

It was originally the intention of Colonel Waugh that the base-line at the upper corner of the North-West Quadrilateral should be measured in the Pesháwar Valley, and in the year 1852 Mr. Logan designed a sketch of triangulation in continuation of the North-West Himalaya Series, in conformity with this idea. But Lieutenant Walker reported that the design was impracticable, for several of the stations were on hills which were not only difficult of access for the great theodolites of this Survey, but to which access could only be obtained under the protection of a large military force, as they were beyond the frontier. Even the British territories in this region did not then present a suitable locality for operations liable to be protracted over a long period, for they were in close vicinity to lawless predatory tribes, who would be readily excited by a prospect of plunder, and to whom the valuable base-line apparatus would probably offer an irresistible temptation unless it was protected by a strong detachment from the garrison of Pesháwar. For these reasons the project of measuring a base-line across the Indus, with the apparatus of compensation bars and microscopes, was abandoned, and a line was eventually adopted in the plains of Chach, east of the great river.

The proposed triangulation through the Pesháwar Valley was therefore modified into a branch secondary series, keeping entirely within British territory, and connecting with some of the stations of Lieutenant Walker's survey. This operation was performed by Mr. W. R. N. James, with a 14-inch vernier theodolite of Colonel Waugh's pattern. As the observations necessitated a much longer residence at each of the stations than Lieut. Walker had needed to make, Mr. James was strongly guarded. At the station of Takht-i-Bahi, on an isolated hill a few miles from the entrance to the passes leading to Swát, the escort was

strengthened by a troop of the Cavalry of Lumsden's Guide Corps, commanded by Rasaldár Fathi-Khan, which remained there for the protection of the signallers after Mr. James had completed his observations and proceeded to the next station. But a rumour had got about among the hill tribes that a European Officer, engaged on important duty, was at the place, and a party of Swát horsemen, conjectured to be about 120 strong, made a night attack on the camp. Approaching quietly in the darkness they tried to pass themselves off as British troops, when challenged by the sentries. The Rasaldár, thinking Mr. James had returned, went out to meet him, but he was quickly undeceived by noticing some lighted matchlocks in the hands of the new arrivals, which showed at once what they were; he shouted out to warn his men and succeeded in preventing them from being taken altogether by surprise; the enemy hesitated for a few minutes and then fired a volley and rode into the camp, where the affray lasted until day break; but owing to the darkness there were few casualties among the men of the Guide Corps, and those of the enemy were never ascertained. This episode is an apposite illustration of the difficulties with which survey operations on the frontier were attended in those early days, immediately after the annexation of the Panjáb.

Mr. James's operations were satisfactorily completed without further let or hindrance, fortunately a few days before orders were received directing them to be stopped.

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### 3. *Secondary triangulation to fix additional hill peaks beyond the Pesháwar Frontier.*

Though Lieutenant Walker had made a point of taking observations to all the hill peaks which were visible from his stations at the time when he visited them, there were many peaks at great distances to the north—on the spurs of the Hindú Kúsh range of mountains—which could only be seen when the atmosphere was exceptionally clear and transparent. To have waited for such favorable opportunities would have greatly retarded his operations and interfered with their main object, which was the making of a survey of the newly acquired and little known British Territory as speedily as possible, rather than getting information about the regions beyond. But of late years it has been necessary to take steps to obtain this information, and during the field season of 1868-69 Captain Carter, R.E., was sent to Pesháwar to fix additional peaks in the region situated between the basins of the Kábul and the Oxus rivers, and more particularly if possible on the range which is so prominently indicated as the Hindú Kúsh on all the maps of that region.

The hills which border the Pesháwar Valley shut out all view of these distant ranges from points on the northern frontier line; but at a few points on the Khattak hills to the south they are over-looked, and views of the distant ranges are occasionally obtained, when the atmosphere is very clear and favorable. Captain Carter visited these points, which had been stations of Lieutenant Walker's survey, and—by observations with a 12-inch theodolite,—he determined the positions of fifty peaks of which the heights are over 15,000 feet, forty peaks ranging between 12,000 and 15,000, and eighteen between 9,000 and 12,000 feet; it was found however that they all appertain to groups of ranges which have hitherto been shewn on the maps as offshoots of the Hindú Kúsh range; and Captain Carter's observations and enquiries

have led him to doubt whether there is any well defined single range of hills to the north, such as the maps show, and to conjecture that instead thereof there is a net-work of hills of no great altitude, the Núksán and other passes between Káshgár and Badakshán being known to be probably not over 16,000 feet in height. The results of Captain Carter's operations have been of much use in rectifying the geography of Swát, Panjkora, Chitrál, Kaffiristan, &c., and the great number of points fixed should much facilitate the operation of persons who may be hereafter employed in exploring those regions.

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4. *The triangulation to hill peaks, in connection with the operations of the Great Indus Series.*

The operations on the Indus Series afforded admirable opportunities for fixing a number of the most prominent points on the Safed Koh and the Súlímáni ranges, to which the sides of some of the principal triangles are very nearly parallel. A few peaks on the eastern end of the Safed Koh had been previously fixed from the Pesháwar Valley, but under very unfavorable circumstances, as they were seen end on, and it was difficult to identify the same peak at different stations of observation. South of the Safed Koh the highest points fixed were, first the contiguous mountains Pírghar and Shúweghar at the northern prolongation of the Súlímáni Range, and then the two summits of the Takht-i-Súlímán. Of these peaks, which range from 11,000 to 11,600 feet in height, either pair would make an admirable base from which to fix a number of points in the *terra incognita* to the west which is bounded by the hill ranges of Kábul, Ghazni and Khilát-i-Ghilzi, and it was often hoped that an opportunity would be afforded of visiting them for this purpose. The Takht-i-Súlímán was the nearest to the frontier and the most accessible, but the natives of the country were so unreliable that the Deputy Commissioner of Dera Ismáil Khan would not sanction any arrangements being made with them for a safe-conduct.

In 1860 an expedition, under Major General Sir Neville Chamberlain, was sent against the Mahsúd Wazírís, in whose country the mountains of Pírghar and Shúweghar are situated, and Major Walker and Lieutenants Basevi and Branfill accompanied the expedition; but unfortunately the Wazírís, when defeated and driven out of their valleys, took refuge on the summits of the very hills which, for geographical purposes, it was most desirable to visit; and as they could not be dislodged without a loss of life which the object would not have justified, the long cherished project of taking observations from the summits of those hills was necessarily abandoned. The only geographical result of the expedition was a survey of the country between the mountains in question and the British Frontier. The principal water-courses in this region are also the main lines of communication, and as the troops marched through them, they were traversed by Lieutenants Basevi and Branfill, with a perambulator and compass, while Major Walker ascended the neighboring hills, interpolated his position from the surrounding trigonometrical points, and made a sketch of the country.

All the most prominent points on the Súlímáni range were fixed in the course of the operations of the Indus Series, and also a few points on the southern hills of Belúchistan, but none on the northern hills, near Khilát, as they were too far off to be seen from the principal stations of the triangulation.

The observations to the whole of the hill peaks referred to in this section were made with the great theodolites, at the principal stations, in the intervals between the observations of the principal angles.

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5. *Secondary triangulation in connection with the operations of the Great Indus Series.*

In the field season of 1856-57, Mr. C. J. Carty conducted a series of secondary triangles along the course of the Indus, from Bani H.S. to Sándi T.S., a distance of about eighty miles; the stations—of which there were nineteen—were mostly situated on the left bank of the river and were well marked, in order to furnish points for the Revenue Survey of the Sind Ságar Doáb; thirty-six additional points were fixed by intersection; the angles were all measured with a 12-inch theodolite.

In 1857-58 Mr. N. A. Belletty conducted a chain of triangles, about thirty-eight miles in length, from the neighbourhood of Dera Ismáil Khan westwards to the frontier towns of Koláchi and Dráband, with a 12-inch theodolite.

In 1859-60 Mr. J. W. Armstrong carried a chain of triangles from the east flank of the Indus Series, opposite Dera Gházi Khan, eastwards, to fix the positions of the towns of Múzaffargarh, Múltán, Shújabád, Khángarh and other points of importance; the length of this triangulation is about seventy miles and the angles were all measured with a 14-inch theodolite. Two years afterwards, this chain of triangles was connected by Mr. George Ryall with the side Jhok-Godri of the Sutlej Series, by a chain of triangles about thirty miles in length, measured with a 12-inch theodolite. The errors generated in these operations, as exhibited by the discrepancies on the side of junction, have been duly dispersed. The results have been divided into two portions, all on the right bank of the River Chenáb being allotted to the Indus Series, and all on the left bank to the Sutlej Series; and they will be published in the corresponding Abstracts of the Results of the Operations of this Survey.

In 1859-60 Mr. George Ryall—after having completed a large amount of work in the preliminary operations of the principal triangulation, building ten stations and clearing four hundred and fifty seven miles of lines—conducted a secondary series with a 12-inch theodolite, from the east flank of the principal triangulation, in latitude  $29^{\circ} 18'$ , up to the town of Baháwalpúr—a distance of about ninety miles—fixing the positions of the towns of Sitpúr, Khyrpúr, Úch and Ahmadpúr, and other points *en route*; subsequently four of these points were fixed in the course of the operations of the Sutlej Series; the discrepancies between the results have been duly dispersed. The details of the secondary triangulation which lies to the west of the Chenáb and the Sutlej Rivers will be incorporated with the Indus Series, and those of the portion to the east of the rivers with the Sutlej Series, and they will be published in the corresponding Abstracts of the Results.

In 1859-60 Lieutenant H. R. Thuillier, R.E., carried a minor triangulation from the east flank of the series, in latitude  $29^{\circ} 30'$ , to connect the Fort of Harrand, a small military outpost on the frontier; this triangulation was executed with a 7-inch theodolite, and its length is about twenty miles.



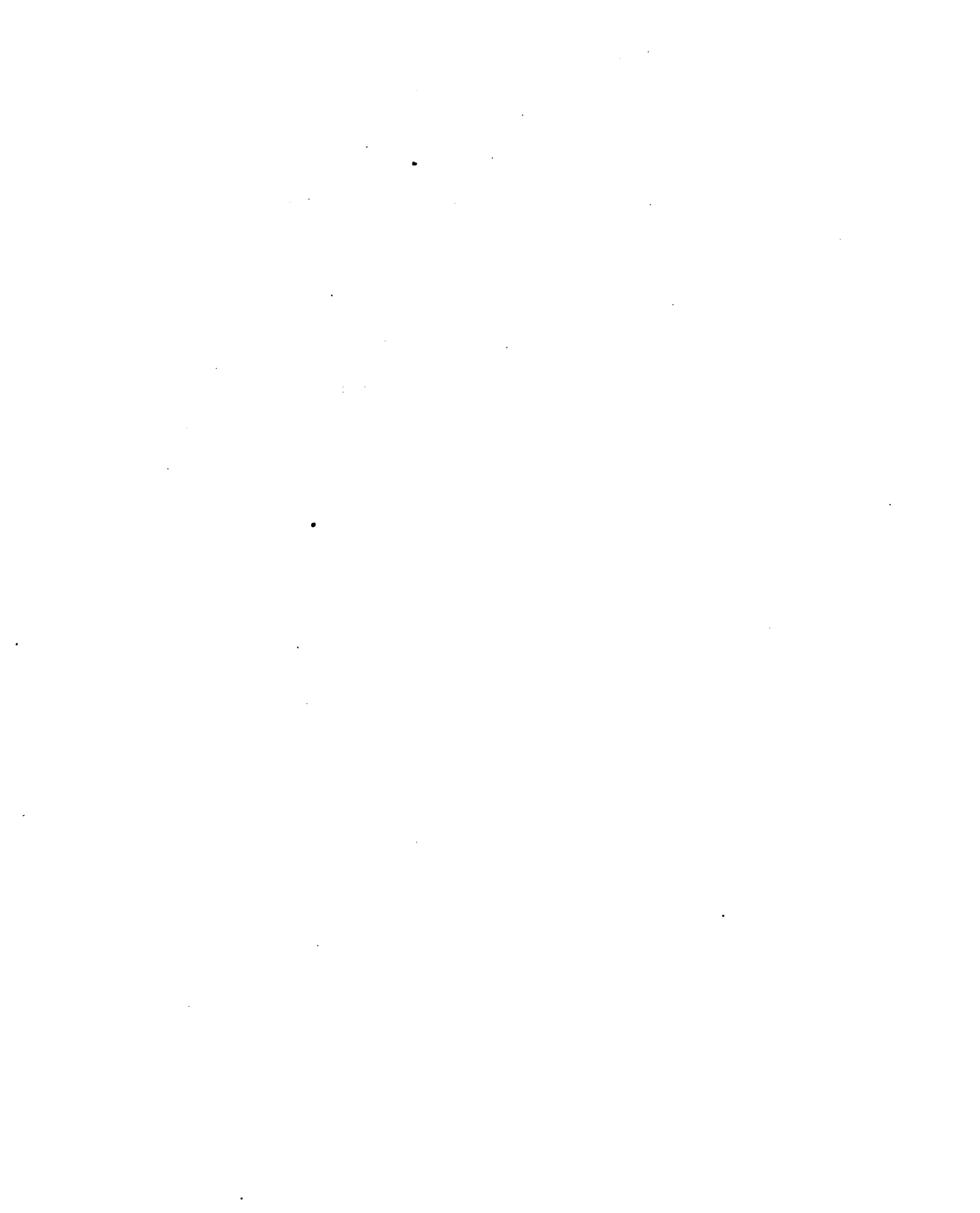
In the field season of 1859-60 Mr. N. A. Belletty conducted a series with a 12-inch theodolite from the east flank of the principal triangulation in lat.  $28^{\circ} 56'$  to the town of Khánpúr, twenty four miles. At the same time Mr. A. W. Donnelly connected the positions of some of the stone bench-marks on the line of spirit levels near Mithankot with the principal stations of the Indus Series.

In 1852-53, Mr. C. Lane executed a secondary series of triangles, with a 14-inch theodolite, which was carried from Karáchi westwards along the coast of the Indian Ocean, to Cape Monze and the Bay of Sonmiání.

The above comprise the whole of the secondary chains of triangles which were executed in order to fix towns and points of importance at a distance from the principal series ; all other such points, which were visible from two or more of the principal stations, were fixed by observations taken at them with the great theodolites.

J. T. WALKER.

*August 1873.*



## ALPHABETICAL LIST OF STATIONS.

Abbáswálá . . . . .	CVIII.	Goghári . . . . .	XXVIII.
Abrín . . . . .	XCVII.	Golá . . . . .	LXXV.
Adúshá . . . . .	XLIV.	Guhman . . . . .	CVI.
Ahmad Sindí . . . . .	CXXXVI.	Gulsherá . . . . .	LXXVII.
Aliáni . . . . .	CXVIII.	Hairo . . . . .	XIV.
Andar . . . . .	VII.	Hájícháchar . . . . .	XLVI.
Bairám . . . . .	XXVII.	Hájípúr . . . . .	LXXXVI.
Bakar . . . . .	CXXXII.	Hámidpúr . . . . .	LXXIV.
Baní . . . . .	CXLIH.	Hátidará . . . . .	XLII.
Barmí . . . . .	CXXVIII.	Heto . . . . .	CXL.
Belá . . . . .	LII.	Hotwálá . . . . .	CIH.
Bhanar . . . . .	LI.	Husainkhán . . . . .	XXXVII.
Bhít . . . . .	X.	Ilwálá . . . . .	CL.
Bhurá . . . . .	XXXIV.	Islámpúr . . . . .	LXXXVIII.
Bhútewálá . . . . .	XCIX.	Ismáil . . . . .	LXXIX.
Bolálio . . . . .	(XXV).	Jalbáni . . . . .	XXXII.
Chakarwálí . . . . .	LXX.	Jálwálá . . . . .	LXXXIX.
Chándiá Khán . . . . .	XXIX.	Jálwálá . . . . .	CXXVI.
Cháthe . . . . .	XIII.	Jangal-pahora . . . . .	XLV.
Chíl . . . . .	L.	Játlá . . . . .	CXLVII.
Chuharlár . . . . .	LXXXIII.	Jhakar . . . . .	XC.
Chúní . . . . .	CXXIV.	Jhamat . . . . .	CXLVI.
Dago . . . . .	LXXVI.	Jharkil . . . . .	CXXVII.
Dájil . . . . .	XCI.	Júkar . . . . .	XXX.
Dalurá . . . . .	XCIII.	Kahírí . . . . .	LXXI.
Dambár . . . . .	VI.	Kalhora . . . . .	XLIII.
Dámráhá . . . . .	XXXI.	Kambar Sháh . . . . .	XC.
Dáowálá . . . . .	LXII.	Kandkot . . . . .	XLIX.
Derá Dín Panáh . . . . .	CXII.	Károhar . . . . .	XXI.
Dín-ká-Kotlá . . . . .	XCIV.	Kasain . . . . .	CXXX.
Doratá . . . . .	C.	Kasmor . . . . .	LVIII.
Farowálá . . . . .	CXVII.	Khái . . . . .	LIII.
Fatte Khán . . . . .	CXXI.	Khandí Kot . . . . .	CX.
Gádí . . . . .	CXL.	Kharbí . . . . .	XV.
Gandpahár . . . . .	XIX.	Khárko . . . . .	XXII.
Gangáh . . . . .	LXXXV.	Kháto . . . . .	V.
Gapolá . . . . .	LXXX.	Khemwálá . . . . .	CIV.
Ghátí . . . . .	I.	Kundrí (old) . . . . .	LXIV.
Ghází Kuháwar . . . . .	XXIII.	Kundrí (new) . . . . .	LXV.

## ALPHABETICAL LIST OF STATIONS.

Kutub-u-dín . . . . .	LV.	Rahúja . . . . .	III.
Lakhá . . . . .	XXVI.	Rákwá . . . . .	CXXIII.
Lakhí . . . . .	XL.	Rhodá . . . . .	CXXXI.
Lálgarh . . . . .	LXXXII.	Riwári . . . . .	LXVI.
Lálgoshí . . . . .	LXXII.	Routí . . . . .	LVII.
Láli . . . . .	XL.	Sabar Khán . . . . .	XVIII.
Lálúwáli . . . . .	LXXXIV.	Sakesar . . . . .	CXLIV.
Langáwála . . . . .	CXVI.	Sakwála . . . . .	CXV.
Lanjiwár . . . . .	LXXXI.	Salár . . . . .	XXXIX.
Lení . . . . .	LIV.	Sándí . . . . .	CXXXVII.
Litan . . . . .	XLVII.	Sarhín . . . . .	LXVIII.
Máchká . . . . .	LIX.	Segrá . . . . .	CXXXIV.
Madádalári . . . . .	LXVII.	Sháhpúr . . . . .	LXXIII.
Máhiwála . . . . .	CVII.	Sháhpúr . . . . .	CXXII.
Maidán . . . . .	CXLII.	Sháwáli . . . . .	LX.
Maihar . . . . .	IV.	Shekh Budín . . . . .	CXXXVIII.
Maio . . . . .	(XXIV).	Sher Jatof . . . . .	XCII.
Mandrá . . . . .	CXXXV.	Sidhr . . . . .	CXLIX.
Mangí . . . . .	XXXV.	Sojra . . . . .	XXIV.
Mará . . . . .	CII.	Sukhíwála . . . . .	CXX.
Mári . . . . .	XXXVIII.	Súlimání . . . . .	IX.
Márú Pír . . . . .	XX.	Súltán-ká-got . . . . .	XLI.
Miání . . . . .	LXIII.	Surlá . . . . .	(XIX).
Miání . . . . .	CXXXIX.	Taman . . . . .	CXLV.
Mirápúr . . . . .	LXIX.	Tambár . . . . .	II.
Mír-ká-kúba . . . . .	XVI.	Tárú . . . . .	LXXVIII.
Mír Khán . . . . .	XII.	Thal Megráj . . . . .	LXXXVII.
Mohammad Sháh . . . . .	CXXV.	Thebá . . . . .	XXV.
Mohána . . . . .	CV.	Tibbí . . . . .	CXIX.
Mojahar . . . . .	XVII.	Tikka . . . . .	VIII.
Mulá Amad . . . . .	LVI.	Tobwála . . . . .	XCVI.
Muriáli . . . . .	CXXXIII.	Tounsá . . . . .	CXIV.
Naharwála . . . . .	XCVIII.	Tunía . . . . .	XXXIII.
Názichand . . . . .	CIX.	Túrí . . . . .	CXIII.
Názír-da-posht . . . . .	LXI.	Umarkhel . . . . .	CXLI.
Pari . . . . .	CXLVIII.	Wásand . . . . .	XLVIII.
Parwá . . . . .	CXXIX.	Yúsuf . . . . .	XXXVI.
Pathrijálá . . . . .	(XVII).		

## NUMERICAL LIST OF STATIONS.

(XXIV)	Maio.	XXXVII	Husainkhán.
(XXV)	(of base-line figures). Bolálio.	XXXVIII	Mári.
I	(of base-line figures). Ghátí.	XXXIX	Salár.
II	Tambár.	XL	Lakhí.
III	Rahúja.	XLI	Súltán-ká-got.
IV	Maihar.	XLII	Hátídará.
V	Kháto.	XLIII	Kalhora.
VI	Dambár.	XLIV	Adúshá.
VII	Andar.	XLV	Jangal-pahora.
VIII	Tikka.	XLVI	Hájicháchar.
IX	Súlimání.	XLVII	Lítan.
X	Bhít.	XLVIII	Wásand.
XI	Láli.	XLIX	Kandkot.
XII	Mír Khán.	L	Chíl.
XIII	Cháthe.	LI	Bhanar.
XIV	Hairo.	LII	Belá.
XV	Kharbí.	LIII	Khái.
XVI	Mír-ká-kúba.	LIV	Lení.
XVII	Mojahar.	LV	Kutub-u-dín.
XVIII	Sabar Khán.	LVI	Mulá Amad.
XIX	Gandpahár.	LVII	Routí.
XX	Márú Pír.	LVIII	Kasmor.
XXI	Károhar.	LIX	Máchká.
XXII	Khárko.	LX	Sháwáli.
XXIII	Ghází Kuháwar.	LXI	Názír-da-posht.
XXIV	Sojra.	LXII	Dáowálá.
XXV	Thebá.	LXIII	Míání.
XXVI	Lakhá.	LXIV	Kundrí (old).
XXVII	Bairám.	LXV	Kundrí (new).
XXVIII	Goghárá.	LXVI	Riwárá.
XXIX	Chándiá Khán.	LXVII	Madádalárá.
XXX	Júkar.	LXVIII	Sarhín.
XXXI	Dámrahá.	LXIX	Mirápúr.
XXXII	Jalbání.	LXX	Chakarwáli.
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## GREAT INDUS SERIES.

## DESCRIPTION OF STATIONS.



(XXIV). Maio Hill Station (*for description, see base-line figures*).

(XXV). Bolálio Hill Station (*for description, see base-line figures*).

I. Ghátí Hill Station, lat.  $25^{\circ} 20'$ , long.  $67^{\circ} 17'$ , is situated in the Karáchí collectorate of Sind, on the most northern of the three peaks of the hill Ghátí. The latter is separated from the Maihar hill merely by a ravine cutting the upper part of the ridge. The only ascent to the station is by a steep road on the eastern side of the hill.

The pillar is solid, and 3 feet high. It carries a mark-stone on its upper surface, one at the level of the ground, and a third at half its height.

II. Tambár Hill Station, lat.  $25^{\circ} 28'$ , long.  $67^{\circ} 3'$ , is situated in the Khelat territory, on the highest point of the Pubb range. The road approaches the station from the N. E. side of the hill.

The pillar is solid, and 3 feet 1 inch high. It has a mark-stone at top, and another at bottom.

III. Rahúja Hill Station, lat.  $25^{\circ} 24'$ , long.  $67^{\circ} 33'$ , is situated in the Karáchí collectorate of Sind, on a peak near the S.E. point of Rahúja hill.

The pillar is solid, and 3 feet high. Mark-stones were placed at top, bottom, and mid-height.

IV. Maihar Hill Station, lat.  $25^{\circ} 32'$ , long.  $67^{\circ} 21'$ , is situated in the Karáchí collectorate of Sind, near the edge of the steep fall from Maihar hill to the Hubb river. There is a road from Tambár H. S. to the station, which crosses the hill at a pass about 6 miles from the latter. No villages exist in this vicinity.

The pillar is solid, and 3 feet high. It has a mark-stone at top, another at bottom, and a third at mid-height.

V. Kháto Hill Station, lat.  $25^{\circ} 47'$ , long.  $67^{\circ} 11'$ , is situated on the highest point of the hill of the same name. The ascent to it is on the western side of the hill.

The pillar is solid, and 3 feet high. A mark-stone was placed at top, another at bottom, and a third half way between.

VI. Dambár Hill Station, lat.  $25^{\circ} 43'$ , long.  $67^{\circ} 33'$ , is situated in the Karáchí collectorate of Sind, near the large village of Tong. The highest peak of the hill is about  $\frac{1}{4}$  of a mile to the E.

The pillar is solid, and 3 feet high.

VII. Andar Hill Station, lat.  $26^{\circ} 1'$ , long.  $67^{\circ} 15'$ , is situated in the Khelat territory, at about 5 miles S.W. of the village owned by Omed Alí, chief of the Chutta tribe. It is approached on the eastern side of the hill.

The pillar is solid, and 3 feet high.

VIII. Tikka Hill Station, lat.  $26^{\circ} 3'$ , long.  $67^{\circ} 32'$ , is situated in zilla Sehwan of the Karáchí collectorate, on a point of the Khirtal range, and about a mile S.E. of the southern most boundary pillar on Tikka hill.

The pillar is solid, and 3 feet high. A mark-stone was placed at its upper surface, another at bottom, and a third at mid-height.

IX. Súlímání Hill Station, lat.  $26^{\circ} 28'$ , long.  $67^{\circ} 15'$ , is situated on the most north-easterly rise of a hill called Sham, on the Khirtal range. The crest of the hill is about 4 miles distant from Tikka H. S.

The pillar is solid, and 3 feet high. Mark-stones were placed at top, bottom, and mid-height.

X. Bhít Hill Station, lat.  $26^{\circ} 21'$ , long.  $67^{\circ} 29'$ , is situated on the highest point of the hill so named which projects northwards from the Khirtal range, and is separated from it by a narrow cleft. The station is approached from the eastern side of the hill.

The pillar is solid, and 4 feet high. Three mark-stones were placed in it, one at top, another at bottom, and a third half-way between.

XI. Lálí Hill Station, lat.  $26^{\circ} 42'$ , long.  $67^{\circ} 18'$ , is situated in the Kukkur kardari of the Shikárpúr collectorate, on the summit of a hill of that name standing between the plain and the Changa Dung range. The station is approached from Bukkur-ka-got, distant about 7 miles.

The pillar is solid, and 3 feet high, having a mark-stone at top, and another at bottom.

XII. Mír Khán Tower Station, lat.  $26^{\circ} 36'$ , long.  $67^{\circ} 31'$ , is situated in the Johí kardari, Karáchí collectorate, on one of the two small rocky hills nearly due west of Gowar Khán's tomb, and separated from it by an extensive chain of low hills.

The tower is solid, and 30.75 feet in height.

XIII. Cháthe Hill Station, lat.  $26^{\circ} 55'$ , long.  $67^{\circ} 18'$ , is situated in the Shikárpúr



collectorate, on a peak standing between the Khirtal range and the low hills skirting the plain. It is approached on the one side by Kasba in the Kukkur kardari, Shikárpúr collectorate, and on the other by Rájádera which is towards Mír-ká-kúba, the road in both cases lying in the bed of the Gaj river.

The pillar is solid, and 3 feet high. It has three mark-stones, one at top, another at bottom, and a third at mid-height.

XIV. Hairo Tower Station, lat.  $26^{\circ} 50'$ , long.  $67^{\circ} 31'$ , is situated in the Júi kardari, Karáchí collectorate, near the well in the village after which it is named. The old village is situated hard by that of Hairo-ka-shahar. The tower about  $\frac{1}{2}$  a mile eastward of the above station was not adopted.

The pillar is perforated, and 30.75 feet in height.

XV. Kharbí Hill Station, lat.  $27^{\circ} 4'$ , long.  $67^{\circ} 22'$ , is situated on a peak of the lowest range of hills bordering the plains of that name. The ascent to it is from the plain, and though not long, it is very steep.

The platform is 2 feet in height.

XVI. Mír-ká-kúba Tower Station, lat.  $27^{\circ} 0'$ , long.  $67^{\circ} 32'$ , is situated in the Mehar kardari, Shikárpúr collectorate, on a sandhill to the N. W. of a number of tombs. These are the tombs of the Amirs of the Kalhorá dynasty, and the station is named after them.

The tower is solid, and 10 feet in height. The lower mark-stones are not trustworthy.

XVII. Mojahar Hill Station, lat.  $27^{\circ} 16'$ , long.  $67^{\circ} 30'$ , is situated on a range of hills running nearly east and west, and forming the southern limit of a basin, which extends as far as the secondary station of Guaria Pír. The hills are table-topped, and the range is the most southerly of those having this direction.

The pillar is solid, and 3 feet high. It contains three mark-stones.

XVIII. Sabar Khán Tower Station, lat.  $27^{\circ} 9'$ , long.  $67^{\circ} 37'$ , is situated a slight distance to the east of the frontier road, in talooka Kukkur, about 2 miles S.W. of Kumber, and  $3\frac{1}{2}$  miles from Mado.

The tower is 15 feet high.

XIX. Gandpahár Hill Station, lat.  $27^{\circ} 25'$ , long.  $67^{\circ} 33'$ , is situated in the Mehar district.

The pillar is solid, and 3 feet in height. It contains three mark-stones placed at top, bottom, and mid-way between them.

XX. Márú Pír Tower Station, lat.  $27^{\circ} 19'$ , long.  $67^{\circ} 41'$ , is situated in the Mehar district of the Shikárpúr collectorate, on a mound about 50 yards to the north-east of the tomb of Márú Pír. The village of Farídábád lies in the direction of Sabar Khán T. S.

The tower is 21 feet in height.

XXI. Károhar Tower Station, lat.  $27^{\circ} 30'$ , long.  $67^{\circ} 44'$ , is situated in the tuppa of Wará, kardari of Nasirábád, collectorate Shikárpúr, on a high mound near the village of the same name.

The tower is about 18 feet in height.

XXII. Khárko Hill Station, lat.  $27^{\circ} 35'$ , long.  $67^{\circ} 36'$ , is situated in the jaghir of the Chandia chief Gaibí Khán, on a hill of that name, with a peculiar cleft appearance. The station is north of the cleft.

The pillar is 8 feet high. It contains the usual mark-stones.

XXIII. Ghází Kuháwar Tower Station, lat.  $27^{\circ} 22'$ , long.  $67^{\circ} 51'$ , is situated in the Ghází Kuháwar tuppa, Nasirábád kardari, Shikárpúr collectorate, immediately to the north of the village from which it takes its name.

The pillar is perforated, and 25 feet in height.

XXIV. Sojra Tower Station, lat.  $27^{\circ} 38'$ , long.  $67^{\circ} 50'$  is situated in the jaghir of the Chandia chieftain Gaibí Khán, on a mound, after which it is named. The hamlet of Burha is about  $\frac{1}{4}$  of a mile to the S.E., the large village of Dost Alí being about 5·2 miles E.N.E., and that of Gaibí-Dera as far in the opposite direction.

The pillar is solid, and 25 feet in height.

XXV. Thebá Tower Station, lat.  $27^{\circ} 29'$ , long.  $67^{\circ} 57'$ , is situated in the tuppa of Wará, kardari Nasirábád, Larkhana division, and zilla Shikárpúr, on the boundary between the lands of Thebá and Lala Ráon, the former of which villages is about a quarter of a mile to the N.W., and the latter about a mile to the N.

The pillar is perforated, and 31·08 feet in height.

XXVI. Lakhá Tower Station, lat.  $27^{\circ} 37'$ , long.  $68^{\circ} 1'$ , is situated in the Kambar kardari, Larkhana division, zilla Shikárpúr. The small village after which it is named is about 200 yards S. of the station, that of Jehjra being 1·2 miles to the S.E., and Kambar 2 miles S.

The pillar is perforated, and 30·58 feet in height.

XXVII. Bairám Tower Station, lat.  $27^{\circ} 45'$ , long.  $67^{\circ} 56'$ , is situated in the Káro tuppa, Kambar kardari. The village from which it takes its name is about 3 miles W., and that of Langí about the same distance away.

The tower is 20 feet in height.

XXVIII. Goghárá Tower Station, lat.  $27^{\circ} 29'$ , long.  $68^{\circ} 4'$ , is situated in the tuppa of Khairpúr, kardari Larkhana, zilla Shikárpúr, on a mound about 0·15 miles north-east of the village from which it takes its name.

The pillar is perforated, and 20·56 feet in height above the mark-stone at ground level.

**XXIX.** Chándiá-Khán Tower Station, lat.  $27^{\circ} 42'$ , long.  $68^{\circ} 8'$ , is situated in the tuppa of Mahin, kardari Kambar. The small village of Chándiá-Khán Doib is about 300 yards to the N.E.

The pillar is perforated, and 30·08 feet in height above the mark-stone at ground level.

**XXX.** Júkar Platform Station, lat.  $27^{\circ} 34'$ , long.  $68^{\circ} 10'$ , is situated in the tuppa of Khairpúr, kardari Larkhana, zilla Shikárpúr, on a high mound, reported to be the remains of an ancient town, about a mile and a-half S. of the road from Larkhana to Kambar. The village of Míthá Derá lies at the foot of the mound in the direction of the ray to Lakhá T. S.

The platform is 4 feet high. It has two mark-stones, one at top, another 1 foot 10 inches below.

**XXXI.** Dámráhá Tower Station, lat.  $27^{\circ} 39'$ , long.  $68^{\circ} 18'$ , is situated in the Larkhana kardari, district Shikárpúr, Upper Sind, about half a mile S.E. by E. of the small village of Dámráhá.

The pillar is perforated, and 40 feet in height above the mark-stone at ground level.

**XXXII.** Jalbání Tower Station, lat.  $27^{\circ} 49'$ , long.  $68^{\circ} 16'$ , is situated in the Rathe Dera kardari, district Shikárpúr, Upper Sind. The small village of Mahomed Khan, inhabited by a sect called Jalbání, is distant only about 300 yards N.

The pillar is perforated, and 40·36 feet in height above the mark-stone at ground level.

**XXXIII.** Tuniá Tower Station, lat.  $27^{\circ} 31'$ , long.  $68^{\circ} 19'$ , is situated in the Larkhana kardari, district Shikárpúr, Upper Sind. The village from which it takes its name is about 100 yards to the N.W., and the town of Larkhana about 5 miles in the same direction. The river Indus flows about a mile to the north of the station.

The pillar is perforated, and 30·21 feet in height above the mark-stone at ground level.

**XXXIV.** Bhurá Tower Station, lat.  $27^{\circ} 38'$ , long.  $68^{\circ} 27'$ , is situated in the Rathe Dera kardari, district Shikárpúr, Upper Sind, on the south side of the deserted village of Bhurá. The large canal called Nara flows about 100 yards S. of the station.

The pillar is perforated, and 30·2 feet in height above the mark-stone at ground level.

**XXXV.** Mangí Tower Station, lat.  $27^{\circ} 45'$ , long.  $68^{\circ} 26'$ , is situated in the Derkan kardari, district Shikárpúr, Upper Sind. The village from which it derives its name is about 300 yards to the N.W.

The pillar is perforated, and 31 feet in height above the mark-stone at ground level.

**XXXVI.** Yúsuf Platform Station, lat.  $27^{\circ} 51'$ , long.  $68^{\circ} 29'$ , is situated in the Derkan kardari, Shikárpúr district, Upper Sind, on the ruins of an ancient village called Yúsuf. The circumjacent villages are as follows :—Wasil, distant  $\frac{1}{2}$  a mile to the S.W. by W.; Udha,  $\frac{1}{4}$  of a mile S., and Fakír-ká-got, 1 mile N. The small mud fort of Yúsuf is about a mile and a-half to the N.E.

The platform is 8·71 feet high. It bears a mark-stone on its surface.

**XXXVII.** Husainkhán Tower Station, lat.  $27^{\circ} 45'$ , long.  $68^{\circ} 35'$ , is situated in the Derkan kardari, district Shikárpúr, Upper Sind. The village from which it derives its name is about half a mile to the W.

The pillar is solid, and 35 feet high. It has a mark-stone on its surface.

**XXXVIII.** Mári Tower Station, lat.  $27^{\circ} 55'$ , long.  $68^{\circ} 38'$ , is situated on the side of a canal, in the kardari and district of Shikárpúr, Upper Sind. The village from which it takes its name is about  $\frac{1}{4}$  of a mile to the S.W., and the town of Shikárpúr about 3 miles N.

The pillar is solid, and 36 feet high. It carries a mark-stone on its upper surface.

**XXXIX.** Salár Tower Station, lat.  $27^{\circ} 59'$ , long.  $68^{\circ} 31'$ , is situated in the Derkan kardari, district Shikárpúr, Upper Sind. The hamlet after which it is named lies about  $1\frac{1}{2}$  miles to the N.W., and the fort of Yásín-ka-garhí is about 3 or 4 miles S.

The pillar is perforated, and 25.4 feet high. It has a mark-stone on the ground floor.

**XL.** Lakhí Tower Station, lat.  $27^{\circ} 51'$ , long.  $68^{\circ} 44'$ , is situated in the Sukkur kardari, district Shikárpúr, Upper Sind, on a small mound raised about 10 feet above the surrounding ground. The village from which the station takes its name is about 100 yards to the S., and the trunk road from Sukkur to Shikárpúr passes at about 100 yards N.

The pillar is solid, and 27.6 feet high. It has a mark-stone at its surface.

**XLI.** Súltán-ká-got Tower Station, lat.  $28^{\circ} 4'$ , long.  $68^{\circ} 39'$ , is situated in the kardari and district of Shikárpúr, Upper Sind. The village so called is about 0.6 of a mile W.

The pillar is perforated, and 25 feet high. It has a mark-stone on the ground floor.

**XLII.** Hátídará Tower Station, lat.  $27^{\circ} 59'$ , long.  $68^{\circ} 47'$ , is situated in the kardari and district of Shikárpúr, Upper Sind, on a sand-hill of that name, elevated about 15 or 16 feet above the level of the surrounding ground. The village of Khánpúr is about  $1\frac{1}{2}$  miles N.W.

The pillar is solid, and 19.3 feet high. It has a mark-stone on its upper surface.

**XLIII.** Kalhora Tower Station, lat.  $28^{\circ} 8'$ , long.  $68^{\circ} 50'$ , is situated on the bank of a large canal in the Mírpúr kardari, district Jacobábád, Upper Sind. The village from which it takes its name is about  $2\frac{1}{4}$  miles to the S.S.W., that of Ahmad Bhúra is about the same distance W., and the large village of Mírpúr about 4 miles N.W.

The pillar is perforated, and 27.3 feet high. It has a mark-stone on a level with the surface of the ground.

**XLIV.** Adúshá Tower Station, lat.  $27^{\circ} 53'$ , long.  $68^{\circ} 56'$ , is situated in the Sukkur kardari, district Shikárpúr, Upper Sind, on one of the bastions of a small dilapidated mud redoubt. The village of Adúshá is distant about  $\frac{1}{4}$  a mile to the N.E.

The pillar is perforated, and 20.92 feet high. It has a mark-stone on the ground floor.

**XLV.** Jangal-pahora Tower Station, lat.  $28^{\circ} 2'$ , long.  $68^{\circ} 57'$ , is situated in the Sukkur

kardari, district Shikárpúr, Upper Sind. The hamlet from which it takes its name is about a mile to the N.E. by E.

The pillar is perforated, and 25·21 feet high. It has a mark-stone on the ground floor.

XLVI. Hájícháchar Tower Station, lat. 27° 56', long. 69° 7', is situated in the Rorí kardari, district Shikárpúr, Upper Sind. The village after which it is named is about 4 miles to the south. The river Indus flows about 1½ miles to the west of the station.

The pillar is perforated, and 25·05 feet high. It has a mark-stone on a level with the surface of the ground.

XLVII. Litan Tower Station, lat. 28° 11', long. 69° 1', is situated in the Shergarh kardari, district Jacobábád, Upper Sind. The hamlet from which the name is derived is about 2½ miles to the S.S.W.

The pillar is perforated, and 29·71 feet high. It has a mark-stone on the ground level.

XLVIII. Wásand Tower Station, lat. 28° 6', long. 69° 8', is situated in the Mírpúr kardari, district Jacobábád, Upper Sind. The hamlet from which it takes its name is close by, and the large village of Gáospúr about 2½ miles to the N.W.

The pillar is perforated, and 25·17 feet high. It has a mark-stone on the ground floor.

XLIX. Kandkot Tower Station, lat. 28° 15', long. 69° 13', is situated on a slight swell of ground, in the Mírpúr kardari, district Jacobábád, Upper Sind. The village from which it takes its name is about 100 yards to the south.

The pillar is perforated, and 35·63 feet high. It has a mark-stone on the ground floor.

L. Chíl Tower Station, lat. 28° 21', long. 69° 6', is situated on a slight swell of ground in the Mírpúr kardari, district Jacobábád, Upper Sind. It takes its name from the locality which is known as Chíl-kúá, from the wells sunk there by Belúchís for watering their camels. The nearest village is Tangwani, distant about 5 miles to the S.W.

The pillar is perforated, and 30·31 feet high. It has a mark-stone on the ground floor.

LI. Bhanar Tower Station, lat. 28° 9', long. 69° 20', is situated in the Mírpúr kardari, district Jacobábád, Upper Sind. The village from which the name is taken is about 150 yards to the south.

The pillar is perforated, and 31 feet high. It has a mark-stone on the ground floor.

LII. Belá Tower Station, lat. 28° 24', long. 69° 16', is situated in the Mírpúr kardari, district Jacobábád, Upper Sind. It takes its name from the locality which is so called by the Belúchís.

The pillar is perforated, and 30·61 feet high, having a mark-stone on a level with the surface of the ground.

LIII. Khái Tower Station, lat. 28° 17', long. 69° 23', is situated in the Kasmor kardari, district Jacobábád, Upper Sind. The village so called is about 5 miles S.

The pillar is perforated, and 30·27 feet high. It has a mark-stone on the ground floor.

LIV. Lení Tower Station, lat.  $28^{\circ} 25'$ , long.  $69^{\circ} 26'$ , is situated in the Kasmor kardari, district Jacobábád, Upper Sind. It takes its name from the locality which is so called by the Belúchís. The village of Kimbí, or Kumbí, is about 5 miles to the S.S.W.

The pillar is perforated, and 30 feet high. It has a mark-stone on the ground floor.

LV. Kutub-u-dín Tower Station, lat.  $28^{\circ} 8'$ , long.  $69^{\circ} 30'$ , is situated on the left bank of the Indus, in the Gotkí kardari, Rorí collectorate, district Shikárpúr, Upper Sind. The village from which it takes its name is about  $\frac{1}{4}$  of a mile S., that of Kotlá being about  $2\frac{1}{4}$  miles E., and Tandrá about 3 miles N.E.

The pillar is perforated, and 29.63 feet high. It has a mark-stone on the ground floor.

LVI. Mulá Amad Tower Station, lat.  $28^{\circ} 18'$ , long.  $69^{\circ} 33'$ , is situated in the Kasmor kardari, district Jacobábád, Upper Sind. The village so called is about 250 yards to the south.

The pillar is perforated, and 26.82 feet high. It has a mark-stone on the ground floor.

LVII. Routí Tower Station, lat.  $28^{\circ} 11'$ , long.  $69^{\circ} 39'$ , is built on the left bank of the Indus, in the kardari of Ubáorá, collectorate Rorí, district Shikárpúr, Upper Sind.

The pillar is 29.75 feet high. It has a mark-stone on the ground floor.

LVIII. Kasmor Tower Station, lat.  $28^{\circ} 26'$ , long.  $69^{\circ} 36'$ , is situated in the Kasmor kardari, district Jacobábád, Upper Sind. The small town from which it takes its name is about 1 mile to the E.S.E.

The pillar is 29.44 feet high. It has a mark-stone on the ground floor.

LIX. Máchká Tower Station, lat.  $28^{\circ} 20'$ , long.  $69^{\circ} 42'$ , is built on an island on the left bank of the Indus, in the Bháwalpúr territory. The village from which it takes its name is about  $\frac{1}{4}$  of a mile W., and that of Daolatpúr is about  $1\frac{1}{2}$  miles N.

The pillar is perforated, and 24.58 feet in height above the mark-stone at ground level.

LX. Sháwálí Tower Station, lat.  $28^{\circ} 27'$ , long.  $69^{\circ} 47'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán, and removed only 20 yards from the right bank of the Indus. The village from which it takes its name is about 0.8 of a mile to the N.N.E.

The pillar is 29.86 feet high. It has a mark-stone on the ground floor.

LXI. Názír-da-posht Hill Station, lat.  $28^{\circ} 34'$ , long.  $69^{\circ} 42'$ , is built on the highest point of an irregular mass of low lime-stone hills, detached from the higher range; sub-division Mithankot, district Dera-Ghází-Khán. There are no habitations within some miles of the station, the nearest being Kasmor and Sháwálí

The pillar is solid, and  $4\frac{1}{2}$  feet high. It has one mark-stone at top, and another at bottom.

LXII. Dáowálá Tower Station, lat.  $28^{\circ} 20'$ , long.  $69^{\circ} 53'$ , is situated in the Bháwalpúr territory on low flat marshy ground, subject to the inundations of the Indus. The village from which its name is derived is about 1 mile to the S.S.W., and that of Mobárák Bareh about 2 miles to the S.S.E. A basement 8 feet in height was constructed, on which the tower was built.

The pillar is perforated, and 22.38 feet high. It has a mark-stone on the ground floor.

LXIII. Míání Tower Station, lat.  $28^{\circ} 34'$ , long.  $69^{\circ} 53'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán. The hamlet after which it is named is about  $1\frac{1}{2}$  miles to the N.E.

The pillar is perforated, and 28 feet high. It has a mark-stone on the ground floor.

LXIV. Kundrí Tower Station (old), lat.  $28^{\circ} 28'$ , long.  $70^{\circ} 1'$ , was built in the Bháwalpúr territory, at a distance of 100 yards from the left bank of the Indus. The village from which its name was derived is 0.48 of a mile to the S.S.W., and that of Saidpúr is distant about 1.6 miles to the N.E. The tower was subsequently swept away by the Indus.

The pillar is perforated, and 30 feet high. It has a mark-stone on the ground floor.

LXV. Kundrí Tower Station (new), lat.  $28^{\circ} 28'$ , long.  $70^{\circ} 1'$ , is built within the village of that name, and distant about 200 yards from the left bank of the river Indus.

The pillar is perforated, and 28.67 feet high. It has a mark-stone on the ground floor.

LXVI. Riwári Tower Station, lat.  $28^{\circ} 38'$ , long.  $70^{\circ} 2'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán. The small village after which it is named is about  $\frac{1}{4}$  of a mile to the west, and the town of Rojhan about 4 miles to the N.N.E.

The pillar is perforated, and 30.27 feet high. It has a mark-stone on the ground floor.

LXVII. Madádalári Tower Station, lat.  $28^{\circ} 42'$ , long.  $69^{\circ} 55'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán. The out-post of Bandowáli is about 4 miles to the N.W.

The pillar is perforated, and 27 feet high. It has a mark-stone on the ground floor.

LXVIII. Sarhín Tower Station, lat.  $28^{\circ} 34'$ , long.  $70^{\circ} 8'$ , is situated in the Bháwalpúr territory, on the left bank of the Indus. The village so called is about  $\frac{1}{2}$  of a mile E., and that of Thúl about a mile to the S.W.

The pillar is perforated, and 26.9 feet high. It has a mark-stone on the ground floor.

LXIX. Mirápúr Tower Station, lat.  $28^{\circ} 45'$ , long.  $70^{\circ} 3'$ , is situated in the Mithankot sub-division, district Dera-Ghází-Khán. The village from which the name is derived is about 3 miles to the S.S.E., and an out-post lies about 300 yards off to the east.

The pillar is perforated, and 25 feet high. It has a mark-stone on the ground floor.

LXX. Chakarwáli Tower Station, lat.  $28^{\circ} 41'$ , long.  $70^{\circ} 11'$ , is built on an extensive island formed by the river Indus, in the sub-division of Mithankot, district Dera-Ghází-Khán. The village so called is about  $3\frac{1}{4}$  miles to the N.W. by W. A basement 5.38 feet in height was constructed, on which was built the tower.

The pillar is perforated, and 21.69 feet in height. It has a mark-stone on the ground floor.

LXXI. Kahírí Tower Station, lat.  $28^{\circ} 49'$ , long.  $70^{\circ} 14'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán. It takes its name from a small village 0.36 miles to the N.N.E., the town of Omarkot being about 3 miles W.

The pillar is perforated, and 31 feet high. It has a mark-stone on the ground floor.

LXXII. Lálgoshí Tower Station, lat.  $28^{\circ} 53'$ , long.  $70^{\circ} 5'$ , is built on a mound so called, in the sub-division of Mithankot, district Dera-Ghází-Khán. The town of Omarkot is about 6 miles E.

The pillar is perforated, and 22·92 feet high. It has a mark-stone on the ground floor.

LXXIII. Sháh-púr Tower Station, lat.  $28^{\circ} 43'$ , long.  $70^{\circ} 22'$ , is built on the left bank of the Indus, in the Bháwalpúr territory. The village so called is 0·63 miles to the S.S.E., that of Rangpúr being about 2 miles E., and Hassan-ka-thul about 2·2 miles to the N.N.E. A basement 5 feet in height was constructed, on which was built the tower.

The pillar is perforated, and 31 feet high. It has a mark-stone on the floor of the basement.

LXXIV. Hámidpúr Tower Station, lat.  $28^{\circ} 57'$ , long.  $70^{\circ} 14'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán. Its name is derived from an out-post so called; the village of Murghai is about 4 miles to the east, and the cantonment of Asni about 5 miles to the N.N.E.

The pillar is perforated, and 30 feet high. It has a mark-stone on the ground floor.

LXXV. Golá Tower Station, lat.  $28^{\circ} 54'$ , long.  $70^{\circ} 23'$ , is situated on the left bank of a branch of the Indus called Kanchani-ka-nalla, and about  $\frac{1}{4}$  of a mile from the right bank of the river, in the sub-division of Mithankot, district Dera-Ghází-Khán. It takes its name from a village distant about 0·4 miles to the S.W., that of Banka being about a mile to the N.N.W., and the town of Mithankot about 3 miles to the N.E.

The pillar is perforated, and 34·79 feet high. It has a mark-stone on the ground floor.

LXXVI. Dago Tower Station, lat.  $29^{\circ} 2'$ , long.  $70^{\circ} 24'$ , is situated on a low mound in the sub-division of Mithankot, district Dera-Ghází-Khán. The village from which it takes its name is about a mile and a-half to the S.W., that of Násir-kotla being about 2 miles to the N.W. of the station.

The pillar is perforated, and 33·50 feet high. It has a mark-stone on the ground floor.

LXXVII. Gulsherá Tower Station, lat.  $29^{\circ} 5'$ , long.  $70^{\circ} 16'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán. The name is derived from the locality which is known as Gulsherá-ka-thul. The town of Rajanpúr lies about 5 miles to the N.E., and the cantonment of Asni about 4 miles to the S.S.E.

The pillar is perforated, and 26·18 feet high. It has a mark-stone on the ground floor.

LXXVIII. Tárú Tower Station, lat.  $28^{\circ} 58'$ , long.  $70^{\circ} 33'$ , is situated in the Bháwalpúr territory, on an island formed by a branch of the Panjnad at its junction with the Indus. The hamlet from which it takes its name is about 0·8 of a mile to the N.E. The tower was raised on a basement of solid masonry 4 feet in height.

The pillar is perforated, and 28·08 feet high. It has a mark-stone on a level with the surface of the basement.



LXXIX. Ismáil Tower Station, lat.  $29^{\circ} 11'$ , long.  $70^{\circ} 22'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán. The small village so called is about 0·2 of a mile to the N.N.W., and that of Isan-ka-kotla is about 4 miles to the E.S.E.

The pillar is perforated, and 32·05 feet high. It has a mark-stone on the ground floor.

LXXX. Gapolá Tower Station, lat.  $29^{\circ} 8'$ , long.  $70^{\circ} 32'$ , is situated in the sub-division of Mithankot, district Dera-Ghází-Khán. The village so called is about 0·6 of a mile to the west, and that of Shikárpúr about 4 miles to the N.W.

The pillar is perforated, and 31·92 feet high. It has a mark-stone on the ground floor.

LXXXI. Lanjiwár Tower Station, lat.  $28^{\circ} 48'$ , long.  $70^{\circ} 32'$ , is situated in the kardari of Gaospúr, of the Bháwalpúr territory. The village of Lanjiwár is 0·4 miles S.E., and that of Koreihi 0·6 miles W.S.W.

The pillar is perforated, and 30·13 feet high. It has a mark-stone on the ground floor.

LXXXII. Lálgarh Tower Station, lat.  $28^{\circ} 39'$ , long.  $70^{\circ} 32'$ , is situated in the Bháwalpúr territory. The large town of Garhí is about  $1\frac{1}{2}$  miles to the N.E.

The pillar is perforated, and 26·23 feet high. It has a mark-stone on the ground floor.

LXXXIII. Chuharlár Tower Station, lat.  $28^{\circ} 53'$ , long.  $70^{\circ} 41'$ , is situated about  $\frac{1}{4}$  a mile east of a hamlet so called. The town of Fattehpúr lies about 2 miles to the S.W., and that of Kádírúp about the same distance to the N.W.

The pillar is perforated, and 24 feet high. It has a mark-stone on the ground floor.

LXXXIV. Lálúwálí Tower Station, lat.  $28^{\circ} 43'$ , long.  $70^{\circ} 42'$ , is situated in the Bháwalpúr territory, within the small village from which it takes its name. The town of Khánpúr is about 5 miles to the south.

The pillar is perforated, and 30·96 feet high. It has a mark-stone on the ground floor.

LXXXV. Gangáh Tower Station, lat.  $29^{\circ} 17'$ , long.  $70^{\circ} 30'$ , is situated in thana Fázalpúr, tahsil Mithankot, district Dera-Ghází-Khán, at a distance of about  $\frac{1}{4}$  of a mile to the S.E. of the town of Fázalpúr.

The pillar is perforated, and 28·16 feet high. It has a mark-stone on the ground floor.

LXXXVI. Hájpúr Tower Station, lat.  $29^{\circ} 21'$ , long.  $70^{\circ} 22'$ , is situated about 200 yards S. of the town so called, in thana and tahsil Dájil, district Dera-Ghází-Khán. The domed tomb of Núr Mahomed is about 100 yards W.

The pillar is perforated, and 25·62 feet high. It has a mark-stone on the ground floor.

LXXXVII. Thal Megráj Tower Station, lat.  $29^{\circ} 16'$ , long.  $70^{\circ} 41'$ , is situated close to and north of the village so called, thana and tahsil Sítpúr, district Mozaffargarh.

The pillar is perforated, and 30·15 feet high. It has a mark-stone on the ground floor.

LXXXVIII. Islámpúr Tower Station, lat.  $29^{\circ} 26'$ , long.  $70^{\circ} 29'$ , is situated on the east

side of the village after which it is named, in thana Jámpúr, tahsil Dájil, district Dera-Ghází-Khán. The town of Mahomedpúr lies about 5 miles to the N.E., and the village of Bokhárá about 3 miles in the same direction.

The pillar is perforated, and 25·21 feet high. It has a mark-stone on the ground floor.

LXXXIX. Jálwálá Tower Station, lat. 29° 24', long. 70° 37', is situated in thana Fázal-púr, tahsil Mithankot, district Dera-Ghází-Khán. It derives its name from a well which is distant about half a mile to the S.W. The town of Rekh lies about 1½ miles E., and Bághwálákú about 1 mile S.

The pillar is perforated, and 25·16 feet high. It has a mark-stone on the ground floor.

XC. Kambar Sháh Tower Station, lat. 29° 32', long. 70° 36', is situated 0·2 of a mile to the S.E. of the village so called, thana Jámpúr, tahsil Dájil, district Dera-Ghází-Khán.

The pillar is perforated, and 24·58 feet high. It has a mark-stone on the ground floor.

XCI. Dájil Platform Station, lat. 29° 33', long. 70° 25', is built on the embankment of the tank close to a paka shiwala to the east of the city after which it is named, thana and tahsil Dájil, district Dera-Ghází-Khán.

The platform is solid, and 3 feet high. It has a mark-stone at its upper surface.

XCII. Sher Jatof Tower Station, lat. 29° 29', long. 70° 43', is built on the left or northern bank of a small branch of the Indus, at about a mile above the junction of the two; thana Jámpúr, tahsil Dájil, district Dera-Ghází-Khán. The following are circumjacent villages:— Sher Gabra, about half a mile to the E.S.E; Kalrú, about 1½ miles to the north; Hairú, about 2½ miles to the east.

The pillar is perforated, and 24·64 feet high. It has a mark-stone on the ground level.

XCIII. Dalurá Tower Station, lat. 29° 39', long. 70° 36', is built on the north-west extremity of a large mound, supposed to be the site of an ancient city, in thana Jámpúr, tahsil Dájil, district Dera-Ghází-Khán. The city of Jámpúr is about 2½ miles to the east, and the village of Fatteh Khán about half a mile to the E.S.E.

The pillar is perforated, and 16·08 feet high. It has a mark-stone on the ground floor.

XCIV. Dín-ká-Kotlá Tower Station, lat. 29° 38', long. 70° 46', is situated in thana Chotákot, tahsil and district Dera-Ghází-Khán. The village from which it derives its name is also known as Dín-Sháh-Kotlá, and is distant ¼ of a mile E., that of Lundí being 0·4 of a mile to the S.S.E.

The pillar is perforated, and 27·33 feet high. It has a mark-stone on the ground floor.

XCV. Jhakar Tower Station, lat. 29° 47', long. 70° 46', is built about 0·1 of a mile S.W. of the village so called, and close to the road from Dera-Ghází-Khán to Sherú; thana Chotákot, tahsil and district Dera-Ghází-Khán.

The pillar is perforated, and 32 feet high. It has a mark-stone on the ground floor.

**XCVI.** Tobwálá Tower Station, lat.  $29^{\circ} 50'$ , long.  $70^{\circ} 37'$ , is built near a well so called, in thana Chotákot, tahsil and district Dera-Ghází-Khán. The circumjacent villages are as follows:—Maná, about 3 miles to the E.S.E.; Khánpúr, 3 miles to the S.; Jhám,  $1\frac{1}{2}$  miles to the N.; Mochíwálá, 1 mile to the N.; Saháran-kí-bastí,  $\frac{1}{4}$  of a mile to the S.W.

The pillar is perforated, and 30·08 feet high. It has a mark-stone on the ground floor.

**XCVII.** Abrín Tower Station, lat.  $29^{\circ} 43'$ , long.  $70^{\circ} 55'$ , is situated in thana Kinjar, tahsil and district Mozaffargarh. The small village of Shekh Mahomed Baksh Abrín lies about  $\frac{1}{2}$  mile to the N.W., that of Durgáhwálá being about 200 yards to the west, and the large village of Khajar about 2 miles to the north.

The pillar is perforated, and 30·73 feet high. It has a mark-stone on the ground floor.

**XCVIII.** Naharwálá Tower Station, lat.  $29^{\circ} 56'$ , long.  $70^{\circ} 43'$ , is built close to a well so called, in kotwali, tahsil, and district Dera-Ghází-Khán. The village of Alíwálá, or Alláh-ká-kot, is 0·3 of a mile to the S.W.

The pillar is perforated, and 29·56 feet high. It has a mark-stone on the ground floor.

**XCIX.** Bhútewálá Tower Station, lat.  $29^{\circ} 54'$ , long.  $70^{\circ} 53'$ , is built close to a well of that name, in kotwali, tahsil, and district Dera-Ghází-Khán. The village of Kahírí is situated 0·3 of a mile to the N.N.W.

The pillar is perforated, and 24·29 feet high. It has a mark-stone on the ground floor.

**C.** Doratá Tower Station, lat.  $30^{\circ} 3'$ , long.  $70^{\circ} 50'$ , is built close to the hamlet so called; kotwali, tahsil, and district Dera-Ghází-Khán. The city of Dera-Ghází-Khán is distant about 1 mile to the N.W.

The pillar is perforated, and 29·16 feet high. It has a mark-stone on the ground level.

**CI.** Ilwálá Tower Station, lat.  $30^{\circ} 4'$ , long.  $70^{\circ} 41'$ , is built on the side of the road leading from Dera-Ghází-Khán to Vidor, and takes its name from the well near which it stands; thana Yáru, tahsil and district Dera-Ghází-Khán. The village of Chaoratta is 0·2 of a mile to the S.E.

The pillar is perforated, and 28·70 feet high. It has a mark-stone on the ground floor.

**CII.** Mára Tower Station, lat.  $30^{\circ} 2'$ , long.  $71^{\circ} 0'$ , is built on a sand-hill close to the road between Kinjar and Goojerat; thana Kinjar, tahsil and district Mozaffargarh. The circumjacent villages are—Mára, about  $\frac{1}{4}$  of a mile to the south; Koreishí, about 3 miles to the north, and Ajjabwálá about a mile to the N.N.W.

The pillar is perforated, and 20·6 feet high. It has a mark-stone on the ground floor.

**CIII.** Hotwálá Tower Station, lat.  $30^{\circ} 11'$ , long.  $70^{\circ} 47'$ , is built close to a well so called in thana Yáru, tahsil and district Dera-Ghází-Khán. The town of Pír Adal is distant about half a mile to the S.W.

The pillar is perforated, and 29·83 feet high. It has a mark-stone on the ground floor.

CIV. Khemwálá Tower Station, lat.  $30^{\circ} 10'$ , long.  $70^{\circ} 59'$ , is built close to a well so called, in thana Mahomed-kot, tahsil Adúkot, district Mozaffargarh. The village of Goojerat is about 0·6 of a mile to the E.N.E.

The pillar is perforated, and 27·35 feet high. It has a mark-stone on the ground floor.

CV. Moháná Tower Station, lat.  $30^{\circ} 18'$ , long.  $70^{\circ} 57'$ , is situated in the small village of that name, in thana Sanawa, tahsil Adúkot, district Mozaffargarh. The village of Tatta-Gumání, is about 3 miles to the east.

The pillar is perforated, and 26·14 feet high. It has a mark-stone on the ground floor.

CVI. Guhman Tower Station, lat.  $30^{\circ} 21'$ , long.  $70^{\circ} 45'$ , is situated close to the small village of Guhmanwálá-ká-kú, in thana Yárú, tahsil and district Dera-Ghází-Khán. The village of Kálá lies about 3 miles to the east, and Rahman about the same distance to the north, the village tower of Gujani being about  $\frac{1}{4}$  of a mile to the N.E.

The pillar is perforated, and 28 feet high. It has a mark-stone on the ground floor.

CVII. Máhíwálá Tower Station, lat.  $30^{\circ} 16'$ , long.  $71^{\circ} 5'$ , is situated in thana Sanawa, tahsil Adúkot, district Mozaffargarh, on a sand-ridge in the boundary of the village of Bhukhi, and separating the hamlets of Máhíwálá and Mahowálá, the former of which is distant 0·22 miles to the S.S.E., and the latter 0·19 miles to the E.N.E. of the station.

The pillar is perforated, and 25·70 feet high. It has a mark-stone on the ground floor.

CVIII. Abbáswálá Tower Station, lat.  $30^{\circ} 24'$ , long.  $71^{\circ} 5'$ , is situated on a high sand-hill 0·5 of a mile S.E. of the well from which the name is derived; thana Sanawa, tahsil Adúkot, district Mozaffargarh. The city of Adúkot is about 5 miles to the N.N.W.

The pillar is perforated, and 25·27 feet high. It has a mark-stone on the ground floor.

CIX. Názichand Tower Station, lat.  $30^{\circ} 26'$ , long.  $70^{\circ} 55'$ , is situated within the boundary of the village of Paríhar, distant from it to the E. about 3 or 4 miles; thana Derá Dín Panáh, tahsil Adúkot, district Mozaffargarh. The village of Názichand is 0·2 of a mile to the S.S.E., and a triple-junction pillar about  $1\frac{1}{2}$  miles to the N.N.E.

The pillar is perforated, and 28·79 feet high. It has a mark-stone on the ground floor.

CX. Khandí Kot Tower Station, lat.  $30^{\circ} 27'$ , long.  $70^{\circ} 44'$ , is situated near the fort of Khandíwálá, in thana Yárú, tahsil and district Dera-Ghází-Khán

The pillar is perforated, and 15·07 feet high. It has a mark-stone on the ground floor.

CXI. Gádí Tower Station, lat.  $30^{\circ} 35'$ , long.  $70^{\circ} 48'$ , is situated in thana Tounsa, tahsil Sungur, district Dera-Ghází-Khán. The village from which it derives its name is distant about 0·7 of a mile to the E.S.E., and Makwal much about the same distance in the opposite direction.

The pillar is perforated, and 25·5 feet high. It has a mark-stone on the ground floor.

CXII. Derá Dín Panáh Platform Station, lat.  $30^{\circ} 34'$ , long.  $70^{\circ} 59'$ , is situated on the top of the N.W. bastion of the old kacha fort so called; thana Derá Dín Panáh, tahsil Adúkot, district Mozaffargarh.

The pillar, 6 feet deep, was countersunk into the bastion, and a mark-stone placed at its upper surface.

CXIII. Túrí Tower Station, lat.  $30^{\circ} 44'$ , long.  $70^{\circ} 54'$ , is situated in the village bearing that name, in the kachi or kadir land of the Indus; thana Sultánkot, tahsil and district Leia. The village of Sultánkot is distant about 5 miles, and Raojá-kí-bastí about 2 miles.

The pillar is perforated, and 18.9 feet high. It has a mark-stone on the ground floor.

CXIV. Tounsá Tower Station, lat.  $30^{\circ} 42'$ , long.  $70^{\circ} 41'$ , is situated at the south-eastern extremity of the town of that name; thana Tounsá, tahsil Sungur, district Dera-Ghází-Khán.

The pillar is perforated, and 21 feet high. It has a mark-stone on the ground floor.

CXV. Sakwálá Tower Station, lat.  $30^{\circ} 42'$ , long.  $71^{\circ} 4'$ , is situated on the elevated sandy tract which forms, as it were, the coast line of the desert; thana Sultánkot, tahsil and district Leia. The village of Paharpúr is about  $3\frac{1}{2}$  miles to the west, and the well of Sakwálá about 0.3 of a mile to the north.

The pillar is perforated, and 25.6 feet high. It has a mark-stone on the ground floor.

CXVI. Langáwálá Tower Station, lat.  $30^{\circ} 51'$ , long.  $70^{\circ} 46'$ , is situated about 0.2 of a mile to the S.S.W. of the small village so called; thana Tounsá, tahsil Sungur, district Dera-Ghází-Khán. The village of Nasir-kí-bastí is a mile and a-half to the E.N.E.

The pillar is perforated, and 24.38 feet high. It has a mark-stone on the ground floor.

CXVII. Farowálá Tower Station, lat.  $30^{\circ} 50'$ , long.  $70^{\circ} 58'$ , is built near the village of that name, on the edge of an elevated sand-ridge; thana Sultánkot, tahsil and district Leia. The village of Jaisul is 0.7 of a mile to the E.S.E.

The pillar is perforated, and 29.8 feet high. It has a mark-stone on the ground floor.

CXVIII. Aliání Tower Station, lat.  $30^{\circ} 59'$ , long.  $70^{\circ} 52'$ , is situated in the kachi, at a distance of half a mile from the villages of Aliání and Thorí, the former of these bearing due east, and the latter north; thana, tahsil, and district Leia

The pillar is perforated, and 23.3 feet high. It has a mark-stone on the ground floor.

CXIX. Tibbí Platform Station, lat.  $31^{\circ} 0'$ , long.  $70^{\circ} 42'$ , stands on the central and highest of three mounds, on the edge of a ridge about 40 feet high, thana Fatte Khán, tahsil Kolachí, district Dera-Ismáil-Khán. The village from which it derives its name is about a mile to the E.N.E.

The pillar is solid, and  $4\frac{1}{2}$  feet high. It has a mark-stone on the surface.

CXX. Sukhíwálá Tower Station, lat.  $30^{\circ} 58'$ , long.  $71^{\circ} 1'$ , is situated close to the well of that name; kotwali, tahsil, and district Leia. The city of Leia is about  $1\frac{1}{4}$  miles W.

The pillar is perforated, and 22 feet high. It has a mark-stone on the ground floor.

CXXI. Fatte Khán Tower Station, lat.  $31^{\circ} 7'$ , long.  $70^{\circ} 47'$ , is built at the southern extremity of the town of Dera-Fatte Khán, and near the round tower known as "Nicholson-ká-burj;" thana Dera-Fatte Khán, tahsil Kolachí, district Dera-Ismáil-Khán.

The pillar is perforated, and 27.75 feet high. It has a mark-stone on the ground floor.

CXXII. Sháhpúr Tower Station, lat.  $31^{\circ} 6'$ , long.  $70^{\circ} 59'$ , is built on a sand-ridge close to the village of that name, and about 200 yards N.N.E. of the salt-patrol bungalow; thana, tahsil, and district Leia.

The pillar is perforated, and 28 feet high. It has a mark-stone on the ground floor.

CXXIII. Rákwá Tower Station, lat.  $31^{\circ} 15'$ , long.  $70^{\circ} 52'$ , is built on a small mound called Atar-sing-ká-burj, the site of an ancient house or tower; thana Karor, tahsil and district Leia. The village of Rákwá is about 0.4 of a mile to the E.

The pillar is perforated, and 30 feet high. It has a mark-stone on the ground floor.

CXXIV. Chúní Tower Station, lat.  $31^{\circ} 16'$ , long.  $70^{\circ} 43'$ , is built on the same mound on which stands the village of that name; thana Dera-Fatte Khán, tahsil and district Dera-Ismáil-Khán.

The pillar is perforated, and  $13\frac{1}{2}$  feet high. It has a mark-stone on the ground floor.

CXXV. Mohammad Sháh Tower Station, lat.  $31^{\circ} 13'$ , long.  $71^{\circ} 3'$ , is situated 0.2 of a mile to the S.E. of the small village of that name; thana Karor, tahsil and district Leia.

The pillar is perforated, and 20.33 feet high. It has a mark-stone on the ground floor.

CXXVI. Jálwálá Tower Station, lat.  $31^{\circ} 25'$ , long.  $70^{\circ} 49'$ , is built on the road between Míran and Kahírí; thana Míran, tahsil and district Dera-Ismáil-Khán. The village from which the station takes its name is 0.2 of a mile to the west.

The pillar is perforated, and 25 feet high. It has a mark-stone on the ground floor.

CXXVII. Jharkil Tower Station, lat.  $31^{\circ} 21'$ , long.  $71^{\circ} 2'$ , is built on a sand-ridge, distant about 250 yards to the S.W. of the village of that name; thana Karor, tahsil and district Leia.

The pillar is perforated, and 25.5 feet high. It has a mark-stone on the ground floor.

CXXVIII. Barmí Tower Station, lat.  $31^{\circ} 31'$ , long.  $70^{\circ} 57'$ , is situated in the Kachi 0.9 of a mile to the S.E. of the village of Barmí; thana and tahsil Bukkur, district Leia.

The pillar is perforated, and 21 feet high. It has a mark-stone on the ground floor.

CXXIX. Parwá Tower Station, lat.  $31^{\circ} 33'$ , long.  $70^{\circ} 48'$ , is built close to the paka well at the eastern extremity of the village after which it is named; thana Míran, tahsil and district Dera-Ismáil-Khán.

The pillar is perforated, and 21.88 feet high. It has a mark-stone on the ground floor.

CXXX. Kasain Tower Station, lat.  $31^{\circ} 28'$ , long.  $71^{\circ} 6'$ , is situated 0.3 of a mile to the N. of the well of that name; thana and tahsil Bukkur, district Leia. The village of Noutok is about  $2\frac{1}{2}$  miles to the N.W.

The pillar is perforated, and 16.13 feet high. It has a mark-stone on the ground floor.

CXXXI. Rhodá Tower Station, lat.  $31^{\circ} 41'$ , long.  $70^{\circ} 53'$ , is situated on the banks of the river, about a mile to the N.E. of the village of that name; thana and tahsil Dera-Ismáil-Khán. The station is adjacent to the site of an old khangah which was destroyed in the severe flood of 1858.

The pillar is perforated, and 20·96 feet high. It has a mark-stone on the ground floor.

CXXXII. Bakar Tower Station, lat.  $31^{\circ} 38'$ , long.  $71^{\circ} 6'$ , is built on an elevation, the site of an old house, in the northern extremity of the city so called; tahsil Bakar, district Leia.

The pillar is perforated, and 22·9 feet high. It has a mark-stone on the ground floor.

CXXXIII. Muríálí Tower Station, lat.  $31^{\circ} 48'$ , long.  $70^{\circ} 57'$ , is built on the edge of the river, on the site of an ancient village of that name. The cantonment of Dera-Ismáil-Khán is about  $1\frac{1}{2}$  miles to the N.W., and the jail about  $\frac{1}{4}$  of a mile to the W.

The pillar is perforated, and 23·9 feet high. It has a mark-stone on the ground floor.

CXXXIV. Segrá Tower Station, lat.  $31^{\circ} 45'$ , long.  $71^{\circ} 8'$ , is built on a high sand-hill, distant 0·3 of a mile N.E. of the village of that name; thana Daria-Khán, tahsil Bakar. The village of Khwar is 1·1 miles to the S.

The pillar is perforated, and 16 feet high. It has a mark-stone on the ground floor.

CXXXV. Mandrá Tower Station, lat.  $31^{\circ} 56'$ , long.  $71^{\circ} 0'$ , is situated 0·5 of a mile N.N.E. of the village so called; thana, tahsil and zilla Dera-Ismáil-Khán.

The pillar is perforated, and 25·5 feet high. It has a mark-stone on the ground floor.

CXXXVI. Ahmad Sindí Tower Station, lat.  $31^{\circ} 53'$ , long.  $71^{\circ} 10'$ , is built on the edge of a sand-ridge, and in the neighbourhood of a place of pilgrimage so called; thana Daria-Khán, tahsil Bakar, zilla Leia. The village of Pansgroun lies to the N., and Daria-Khán to the S., that of Thalletan being 1·6 miles to the W.N.W.

The pillar is perforated, and 26·5 feet high. It has a mark-stone on the ground floor.

CXXXVII. Sándí Tower Station, lat.  $32^{\circ} 1'$ , long.  $71^{\circ} 13'$ , is built on the edge of an elevated sandy tract, in thana Kullur, tahsil Bakar, district Leia. The village of Chap Sándí is 0·8 of a mile to the west, and the tomb of Pír Bakhtiár 0·8 of a mile to the S.

The pillar is perforated, and 21 feet high. It has a mark-stone on the ground floor.

CXXXVIII. Shekh Budín Hill Station, lat.  $32^{\circ} 18'$ , long.  $70^{\circ} 51'$ , is built on the well-known hill of that name, otherwise called Sháh Budín and Makdúm-ka-gund, which is the highest point of the range separating Bunnoo and Marwat from the Deraját, thana Paharpúr, district Dera-Ismáil-Khán. The station is approached on the east by a road from Punniala, and on the north by one from Ughzur-khel in Marwat.

The pillar is solid, and  $2\frac{1}{2}$  feet high. It has a mark-stone on the surface.

CXXXIX. Miáni Tower Station, lat.  $31^{\circ} 54'$ , long.  $71^{\circ} 21'$ , is built on a high mound, in

the elevated sandy tract of the Sind-Ságar-Doáb, to the south-east of the hamlet of Pakí Miání, thana Kullur, tahsil Bakar, district Leia. The road from Dera-Ismáil-Khan to Sháhpúr passes about 2 miles to the W. of the station.

The pillar is perforated, and 28 feet high. It has a mark-stone on the ground floor.

**CXL.** Heto Tower Station, lat.  $32^{\circ} 3'$ , long.  $71^{\circ} 27'$ , is situated in the lands of the village of that name, on the elevated sandy tract of the Sind-Ságar-Doáb, thana Kalor, tahsil Bakar, zilla Leia. The road from Dera-Ismáil-Khán to Sháhpúr passes within a few yards of the station. The village of Kasor is in the neighbourhood, and that of Heto is about 4 miles to the W.S.W.

The pillar is perforated, and 32 feet high. It has a mark-stone on the ground floor.

**CXLI.** Umarkhel Hill Station, lat.  $32^{\circ} 26'$ , long.  $71^{\circ} 18'$ , is situated on the Khúpúr range of hills on the west bank of the Indus, and between the Koorum river and the Deraját, choki Kírí, thana Paharpúr, district Dera-Ismáil-Khán. The village from which it derives its name is 2 miles away to the E., and from it the station is approached by an easy but circuitous road.

The pillar is solid, and 2 feet high. It has a mark-stone on the surface.

**CXLII.** Maidán Hill Station, lat.  $32^{\circ} 51'$ , long.  $71^{\circ} 11'$ , is built on one of the highest peaks of the eastern of two ranges of hills which separate the valley of Bunnoo from that of the Indus, between Kálábágh and the Koorum river. It is under the authority of the Deputy Commissioner of Kohát, and is distant about a mile to the S.E. of the village whose name it bears. The station is approached by the village of Míthá on the S.E.

The pillar is solid, and 1 foot high. It has a mark-stone on the surface.

**CXLIII.** Baní Hill Station, lat.  $32^{\circ} 56'$ , long.  $71^{\circ} 42'$ , is situated on the S.E. peak of a low range of hills, in mouza Baní, pargana and tappa Bagí, tahsil Talagang, thana Chakrala, district Jhelum. The town of Kálábágh is distant, in a direct line, about 5 miles.

The pillar is solid, and 2 feet high. It has a mark-stone on the surface.

**CXLIV.** Sakesar Hill Station, lat.  $32^{\circ} 33'$ , long.  $71^{\circ} 59'$ , is built on the highest point of the well-known hill of that name; thana Kubakí, mouza Uchalí, tahsil Talagang, district Jhelum. The station is approached by the village of Chitta, situated on the lake in the Sun valley.

The pillar is solid, and 2 feet high. It has two mark-stones, one at top, the other on the surface of the rock *in situ*.

**CXLV.** Taman Station, lat.  $32^{\circ} 57'$ , long.  $72^{\circ} 8'$ , is built on a slightly-elevated piece of ground; thana Taman, tahsil Talagang, district Jhelum. The village after which it is named is about 3 miles to the N.E.

The pillar is solid, and 2 feet high. It has a mark-stone at top, and another at bottom.

**CXLVI.** Jhamat Hill Station, lat.  $33^{\circ} 16'$ , long.  $71^{\circ} 59'$ , is situated on a low range



of hills in mouza Narí-ka-dok, thana Makad, tahsil Pindi Gheb, district Rawul Pindi. The large village from which the name of the station is taken is about 3 miles N.W., and Malewal about  $4\frac{1}{2}$  miles N.E.

The pillar is solid, and 2 feet high. It has a mark-stone on the surface.

CXLVII. Játlá Hill Station, lat.  $32^{\circ} 48'$ , long.  $72^{\circ} 25'$ , is built on a low hill about  $\frac{1}{4}$  of a mile S. of the well-known village of that name; thana and tahsil Talagang, district Jhelum.

The pillar is solid, and 2 feet high, having a mark-stone at top, and another at bottom.

CXLVIII. Pari Hill Station, lat.  $33^{\circ} 10'$ , long.  $72^{\circ} 19'$ , is on the western extremity of a range of low sand-stone hills in the mouza of Pari, tappa and tahsil of Pindi Gheb, thana Jand, district Rawul Pindi. The village which gives its name to the station is about 1 mile to the E., and Pindi Gheb about 6 miles N.

The pillar is solid, and 2 feet high. It has a mark-stone on the surface.

CXLIX. Sidhr Station, lat.  $33^{\circ} 0'$ , long.  $72^{\circ} 42'$ , is built on the site of the deserted village of Ajnáló in the mouza of Sidhr, tappa, tahsil and thana of Chakwál, district Jhelum. The large and well-known village of Munda is about 3 miles S., and that of Kharsar about the same distance N.

The pillar is solid, and 2 feet high. It has a mark-stone on the surface.

(XVII.) Pathrijálá Hill Station (*for description, see base-line figures*).

(XIX.) Surlá Hill Station (*for description, see base-line figures*).





ADDENDUM TO DESCRIPTION OF STATIONS.

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NOTE.—Consequent on modern alterations of district and other boundaries, the sites occupied by the stations are now included in civil divisions of territory which differ frequently from the district, pargana or village, recorded in the preceding descriptions of stations: a suitably modified statement of the sub-divisions in question is accordingly given in the following table and is derived chiefly from the annual reports, up to 1873, made by the Civil Officials to whose care the stations have been committed.

It has become customary in modern times to erect a square protecting pillar at Principal Station over the circular pillar on which the large theodolite stood and which carries the true mark-stone; the square pillar bears a sufficiently accurate mark for Topographical and Revenue Survey purposes, so that it is generally unnecessary to refer to the true mark-stone which thus remains concealed and protected. The only stations which are protected in the manner described are CXII and CXXIV.

No.	Local name	District	Pargana &c.	Village	REMARKS
(XXIV)	Sagio	Karáchi	Táluka Karáchi	Hubb Makán Maio & Gudap	
(XXV)	Bolári	"	"	Hubb Makán Thudo	
I	Ghating Thul	"	Kohistán	Karchát	
II	...	Khelát			
III	Thulo Rahúja	Karáchi	Kohistán	Rahúja	
IV	" Maihar	"	"	Maihar	
V	...	Khelát			
VI	Thulo Dambár	Karáchi	Kohistán	Taung	
VII	...	Khelát			
VIII	Thulo Khír Thur	Karáchi	Kohistán	Tiko Barun	
IX	...	Khelát			
X	Thulo Phaduk Lukwáro	Karáchi	Sihwán	Phaduk	
XI	...	Khelát			
XII	Got Mír Khán	Sihwán (Karáchi Collectorate)	Táluka Dádu, Thá. Rahím Khán's Than- da	Got Mír Khán	
XIII	...	Khelát			
XIV	Hairo Khán's Got	Sihwán (Karáchi Collectorate)	Táluka Dádu, Thá. Johi	Hairo Khán's Got	
XV	Kund Jabelwáro	Shikárpur	Kakkar	Khúbi	
XVI	Mír-ka-Kúba	"	"	Makám Nasír Mu- hammad	The tower fell down in 1872.
XVII	...	"			
XVIII	Kur Husain	"	Kakkar	Sabar Khán	
XIX	...	"			
XX	Máru Pír	"	Mehar	Furrub Dera	
XXI	Daro Karohar	"	Táluka Kambar	Karohar	Has no tower.
XXII	...	"			
XXIII	Ghází Kuháwar	"	Nasirabad	Ghází Kuháwar	
XXIV	...	"			
XXV	Kutab	"	Nasirabad	Pechuba	
XXVI	Lákha	"	Táluka Lár- khána	Pír Muhammad Lákho	Has no tower, platform damaged.
XXVII	Bahrám (upper)	"	" Kambar	Chágri and Bah- rám	
XXVIII	Ghagháro	"	" Lárkhána	Ghagháro and Sultán Virak	

NOTE.—Thá. stands for Thánah.

No.	Local name	District	Pargana &c.	Village	Remarks
XXIX	Drib Chándia Khán	Shikárpur	Táluka Lár- khána	Drib Chándia	
XXX	Jhukar	"	" "	Mitho dero	
XXXI	Dhámráha	"	" "	Dara Gad	
XXXII	Jalbáni	"	" Rata	Muhammad Khán Jalbáni	Has no tower.
XXXIII	Tunia	"	Dera Lár- khána	Ilias	
XXXIV	...	"			
XXXV	Chutto Mangi	"	Táluka Nau- shahra	Chutto Mangi	A huge branch of a tree has been thrust down the shaft and apparently can- not be extracted.
XXXVI	Ali Khán	"	" "	Ali Khán	
XXXVII	Adamji	"	" "	Adamji	
XXXVIII	Garhi Yásín	"	" "	Garhi Yásín	
XXXIX	"	"	" "	Salár	
XL	Lakhi	"	" Sakkhar	Lakhi	
XLI	Kot Sultán	"	" Shikárpur	Kot Sultán	The paka perforated pillar is quite unprotected above and the shaft down the centre is full of earth
XLII	Borri	"	" Sakkhar	Borri	
XLIII	...	Jacobabad	Tappa Mírpur	Mírpur	
XLIV	Garhi Adúsháh	Shikárpur	Táluka Sakkhar	Garhi Adúsháh	
XLV	...	"	...	Jangal-Pahora	
XLVI	Phúlyáni	"	Division Rohri Táluka Azád- pur	Shikárgáh	
XLVII	Lithan	Jacobabad	Tappa Shergarh	Kurrampur	
XLVIII	Wasand	"	" Gauspur	Gauspur	
XLIX	Kandkot	"	" Kandkot	Kandkot	
L	Chíl	"	" Tung- wánu	Chíl	
LI	Bhanar	"	" Kandkot	Bhanar	
LII	Táj	"	" "	Táj	
LIII	Pipli	"	" Gobla	Khái	
LIV	Leni	"	" Kasmor	Drakkhan	
LV	Kutabdí	Shikárpur	Divn. Rohri, Tá- luka Ghotiki	Wusti Kutab- dí	
LVI	...	Jacobabad	...	Mulla Ahmad	
LVII	Maharowah	Shikárpur	Divn. Rohri, Táluka Ubaura	Got Abdu Su- mejo	
LVIII	Kasmor	Jacobabad	Tappa Kasmor	Kasmor	
LIX	Máchko	Shikárpur	Divn. Rohri, Táluka Ubaura	In jungle	
LX	Sháhwáli	Jacobabad	On the border between Pan- jáb & Sind	Sháhwáli	Washed away by the river Indus in 1871.
LXI	Yara	Dera Gházi Khán	Teh. Rájanpur, P. Sháhwáli	Sháhwáli	Carried away by river, July 1871.

P. stands for Pargana and Teh. for Tehsil.

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ADDENDUM TO DESCRIPTION OF STATIONS.

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No.	Local name	District	Pargana &c.	Village	Remarks
LXII	...	Bháwalpur	P. Kot Sheral	Dauwála	*
LXIII	Míáni Angál	Dera Gházi Khán	Teh. Rájanpur, P. Sháhwalí	Míáni	*
LXIV	...	Bháwalpur	...	...	Destroyed.
LXV	...	"	"	"	"
LXVI	Rewári	Dera Gházi Khán	Teh. Rájanpur, P. Sháhwalí	Hamidka	*
LXVII	Warzi	"	"	Rojhan	*
LXVIII	...	Bháwalpur	Amenkhar	Sarhín	*
LXIX	Kohna	Dera Gházi Khán	Teh. Rájanpur, P. Sháhwalí	Mírapur	*
LXX	Chakarwáli	"	"	Kacha Chaván	*
LXXI	Kahíri	"	"	Kahíri	*
LXXII	Lálgosha	"	"	Mírapur	*
LXXIII	...	Bháwalpur	Sháhpur	Sháhpur	*
LXXIV	...	Dera Gházi Khán	Rájanpur	Hámidpur	*
LXXV	Madgola	"	Teh. Rájanpur, P. Sháhwalí	Madgola	*
LXXVI	...	"	Rájanpur	Kotla Nasír	*
LXXVII	Burj Paimáish	"	Teh. Rájanpur	"	*
LXXVIII	...	Bháwalpur	Míáni	Khera	*
LXXIX	Burj Paimáish	Dera Gházi Khán	Teh. Rájanpur, Thá. Rájan	Basti Ismáíl	*
LXXX	"	"	Teh. Rájanpur, Thá. Fázilpur	Gapola	*
LXXXI	...	Bháwalpur	...	Lanjiwár	*
LXXXII	...	"	...	...	*
LXXXIII	...	"	Shewani	Jauharwála	*
LXXXIV	...	"	Nawakot	Lálúwáli	*
LXXXV	Burj Paimáish	Dera Gházi Khán	Teh. Rájanpur, Thá. Fázilpur	Fázilpur	*
LXXXVI	Hájipur	"	Teh. Jámpur, P. Hájipur	Hájipur	*
LXXXVII	...	Muzaffargarh	Sítpur	Mírapur Bamfri	*
LXXXVIII	...	Dera Gházi Khán	Teh. Jámpur, P. Hájipur	Islámpur	*
LXXXIX	...	"	Teh. Rájanpur	Rikh	*
XC	Kambarsháh	"	Teh. and Thá. Jámpur	Kambarsháh	*
XCI	...	"	Teh. Jámpur, P. Dájál	Dájál	*
XCII	Tab Rámpur	"	Teh. and Thá. Jámpur	Tab Rámpur	Carried away by river, July 1871.
XCIII	Dher Dalura	"	Teh. & P. Jám- pur	Dhegána	*
XCIV	Dín-ka-Kotla	"	Teh. Dera Ghá- zi Khán, Thá. Chota Kot	Dín-ka-Kotla	*
XCV	Jhakar	"	"	Jhakar	*

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No.	Local name	District	Pargana &c.	Village	Remarks
XCVI	Tobwála	Dera Gházi Khán	Teh. Dera Gházi Khán, P. Doda Shakra	Kahiri	*
XCVII	...	Muzaffargarh	Shahr Sultán	Abrind	*
XCVIII	Alíwála	Dera Gházi Khán	Teh. Dera Gházi Khán	Haidarwan	*
XCIX	Phaphiwála	"	"	Kotla Ahmad Khán	*
C	Dorata Danidás-wála	"	"	Sakhera Arain	*
CI	Choratta Thul-wála	"	Teh. Dera Gházi Khán, P. Kot Haibat	Choratta	*
CII	...	Muzaffargarh	Arain	Bahádar Mára	*
CIII	Malíta Kullawála	Dera Gházi Khán	Teh. Dera Gházi Khán, P. Kot Haibat	Hot Arain	*
CIV	...	Muzaffargarh	P. Mahmúdkot	Gujrát	*
CV	...	"	P. Sanáwa	Mohána	*
CVI	Guhmanwála	Dera Gházi Khán	Teh. Dera Gházi Khán, P. Alamkhán	Kasai	*
CVII	...	Muzaffargarh	Sanáwa	Bhukhi	*
CVIII	...	"	"	Abbáswála	*
CIX	...	"	Thá. Sanáwa	Adukot	*
CX	Kot Kandi	Dera Gházi Khán	Teh. Dera Gházi Khán, P. Alamkhán	Kot Kandi	*
CXI	Gadai	"	Teh. Sangarh Thá. Tounsa	Gadi Samdila	*
CXII	...	Muzaffargarh	Thá. Dera Dín Panáh	Dera Dín Panáh	*
CXIII	Túria	Dera Ismáíl Khán	Teh. Líah, Thá. Kot Sultán	Bet Dabli	*
CXIV	Tounsa	Dera Gházi Khán	Teh. Sangarh P. Tounsa	Tounsa	*
CXV	Pahárpur	Dera Ismáíl Khán	Teh. Líah, Thá. Kot Sultán	Pahárpur	*
CXVI	Khu Langáwála	Dera Gházi Khán	Teh. Sangarh Thá. Tounsa	Nari Sangi	*
CXVII	Jaisal	Dera Ismáíl Khán	Teh. Líah, Thá. Kot Sultán	Jaisal	*
CXVIII	Aliáni	"	Teh. and Thá. Líah	Aliáni	*
CXIX	Tibbi	"	Teh. Koláchi, Thá. Jallowála	Tibbi	*
CXX	Samra	"	Teh. and Thá. Líah	Samra	*
CXXI	Fathi Khán	"	Teh. Koláchi, Thá. Jallowála	Fathi Khán	*
CXXII	Sháhpur	"	Teh. and Thá. Líah	Sháhpur	*

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ADDENDUM TO DESCRIPTION OF STATIONS.

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No.	Local name	District	Pargana &c.	Village	Remarks
CXXIII	Rákwa	Dera Ismáíl Khán	Teh. and Thá. Karor	Rákwa	*
CXXIV	Chúni	"	Teh. Koláchi, Thá. Jallowála	Chúni	*
CXXV	Karor	"	Teh. & Thá. Karor	Karor	*
CXXVI	Jál	"	Teh. Dera, Thá. Miran	Jál <i>alias</i> Músa Saháni	
CXXVII	Jharkil	"	Teh. and Thá. Karor	Jharkil	*
CXXVIII	Barmi	"	Teh. and Thá. Bhakkhar	Barmi	*
CXXIX	Parwa	"	Teh. Dera, Thá. Miran	Parwa	*
CXXX	Nautak	"	Teh. & Thá. Bhakkhar	Nautak	*
CXXXI	Rhoda	"	Teh. & Thá. Dera Ismáíl Khán	Rhoda	} Washed away by encroachments of Ban Indus, May 1871.
CXXXII	Bhakkhar	"	Teh. & Thá. Bhakkhar	Bhakkhar	
CXXXIII	Muriáli	"	Teh. & Thá. Dera Ismáíl Khán	Muriáli	
CXXXIV	Khoawar	"	Teh. & Thá. Bhakkhar	Khoawar	*
CXXXV	Mandra	"	Teh. & Thá. Dera Ismáíl Khán	Mandra	*
CXXXVI	Bogah Sháh	"	Teh. Bhakkhar, Thá. Angra	Bogah Sháh	
CXXXVII	Chap Sandi	"	"	Janda Kalval	The station is a few yards to the east of the Club House erected by the Officers of the Panjáb Force. As the Club House shuts a number of hills out of view from the station, it was necessary to have a subsidiary station from whence to observe the hills in question. This was chosen on the slope of the ridge, a little below and on the north side of the summit which is occupied by the shrine of Shaikh Búdín. A paka pillar and chabútra were erected for the subsidiary station, which was fixed by observations taken thereat, at the principal station, and at Maidán H.S.
CXXXVIII	Shaikhubudin	"	Teh. Dera, Thá. Pahárpur	Shaikhubudin	

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No.	Local name	District	Pargana &c.	Village	Remarks
CXXXIX	Jandwála	Dera Ismáíl Khán	Teh. Bhakkhar, Thá. Jandwála	Jandwála	
CXL	Hetu	"	"	Hetu	
CXLI	Umar Khail	"	Teh. Dera, Thá. Pahárpur	Umar Khail	
CXLII	...	Kohát	...	Maidán	
CXLIII	Bani	Bannu	Isákhail, Kálá- bágh	Bani	
CXLIV	Sakesar	Sháhpur	Thá. Naushahra	Rakh Sakesar	
CXLV	...	Jhílam	Thá. Taman	Taman	
CXLVI	Burj Kampás	Ráwal Pindi	Teh. PindiGhaib	Jhamat	
CXLVII	...	Jhílam	Thá. Talagang	Jatla	
CXLVIII	Buti	Ráwal Pindi	Teh. PindiGhaib	Pari	
CXLIX	...	Jhílam	Thá. Chakwal	Sidhur	
(XVII)	Burj Kampás	Ráwal Pindi	Teh. PindiGhaib	Káli Dilli	
(XIX)	Burj Pir Kandia	"	Kahuta	Dhok Muri	

P. stands for Pargana, Teh. for Tehsil and Thá. for Thánah.



## GREAT INDUS SERIES.

## OBSERVED ANGLES.

At (XXIV)

November 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch  
Theodolite.

Angle between	Circle readings, telescope being set on II										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
II & I	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 28" 63 <i>w</i> = 6.87 $\frac{1}{w}$ = 0.15 <i>C</i> = 53° 43' 28" 63
	h28°04	h27°74	h32°02	l30°26	l29°16	l27°32	h28°44	h28°22	h27°04	l28°36	
	h28°08	h28°26	h30°00	l27°48	l31°00	l28°60	h27°44	h26°62	h27°88	l28°12	
	h28°88	h26°74	h29°98	l29°20	l30°32	l28°08	h28°32	h26°84	h26°82	l28°66	
			l29°76		l28°94				l29°38		
			l31°22								
	28°33	27°58	30°67	29°58	30°16	28°24	28°07	27°23	28°01	28°38	
I & (XXV)	h41°20	h42°48	h41°46	l40°38	l45°90	l41°44	h45°66	h43°42	h44°12	l44°80	<i>M</i> = 43" 19 <i>w</i> = 3.73 $\frac{1}{w}$ = 0.27 <i>C</i> = 57° 27' 43" 19
	h43°34	h41°34	h40°84	l42°50	l44°16	l42°02	h45°26	h43°54	h44°76	l44°98	
	h41°64	h42°68	h40°70	l42°14	l43°02	l41°56	h44°20	h44°02	h45°94	l44°76	
	h43°06		l41°58	l44°80	l45°04						
	42°31	42°17	41°00	41°65	44°58	41°67	45°04	43°66	44°94	44°85	

NOTE.—(XXIV) and (XXV) appertain to base-line figures.

At (XXV) .											
<i>November 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XXIV)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
(XXIV) & I	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 11''72 <i>w</i> = 9.73 $\frac{1}{w}$ = 0.10 <i>C</i> = 51° 46' 11''71
	<i>h</i> 11'96	<i>h</i> 12'18	<i>l</i> 11'70	<i>l</i> 9'30	<i>l</i> 11'36	<i>h</i> 13'78	<i>l</i> 11'28	<i>l</i> 13'26	<i>h</i> 11'20	<i>h</i> 13'30	
	<i>h</i> 11'82	<i>h</i> 11'94	<i>l</i> 10'74	<i>l</i> 10'28	<i>l</i> 10'32	<i>h</i> 13'14	<i>l</i> 13'26	<i>l</i> 10'64	<i>h</i> 12'92	<i>h</i> 11'54	
	<i>h</i> 11'26	<i>l</i> 12'78	<i>l</i> 9'56	<i>l</i> 10'86	<i>l</i> 11'82	<i>h</i> 12'22	<i>l</i> 12'18	<i>l</i> 11'74	<i>h</i> 12'96	<i>h</i> 12'16	
			<i>l</i> 10'10					<i>l</i> 9'48			
								<i>l</i> 11'56			
	11'68	12'30	10'53	10'15	11'17	13'05	12'24	11'34	12'36	12'33	
I & III	<i>h</i> 35'16	<i>h</i> 34'90	<i>l</i> 35'70	<i>l</i> 37'10	<i>l</i> 40'00	<i>h</i> 37'12	<i>l</i> 35'94	<i>l</i> 35'22	<i>h</i> 37'16	<i>h</i> 36'98	<i>M</i> = 36''54 <i>w</i> = 7.90 $\frac{1}{w}$ = 0.13 <i>C</i> = 57° 49' 36''55
	<i>h</i> 36'42	<i>l</i> 35'34	<i>l</i> 36'82	<i>l</i> 36'24	<i>l</i> 39'12	<i>h</i> 37'94	<i>l</i> 36'62	<i>l</i> 35'88	<i>h</i> 34'96	<i>h</i> 37'16	
	<i>h</i> 36'02	<i>l</i> 33'94	<i>l</i> 37'68	<i>l</i> 36'68	<i>l</i> 37'34	<i>h</i> 37'22	<i>l</i> 37'24	<i>l</i> 36'00	<i>h</i> 35'60	<i>h</i> 38'22	
			<i>l</i> 35'86		<i>l</i> 38'20				<i>h</i> 35'76		
					<i>l</i> 39'24				<i>h</i> 36'28		
					<i>h</i> 38'00						
					<i>h</i> 37'54						
	35'87	34'73	36'52	36'67	38'49	37'43	36'60	35'70	35'95	37'45	
At I											
<i>December 1853, observed by Lieutenant J. F. Tennant and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on II										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 14'	187° 14'	14° 26'	194° 26'	21° 38'	201° 38'	28° 50'	208° 50'	
II & IV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 38''05 <i>w</i> = 11.45 $\frac{1}{w}$ = 0.09 <i>C</i> = 78° 30' 38''05
	<i>h</i> 37'32	<i>l</i> 37'04	<i>l</i> 37'28	<i>l</i> 38'20	<i>l</i> 37'12	<i>h</i> 39'26	<i>h</i> 38'22	<i>l</i> 38'82	<i>l</i> 38'94	<i>l</i> 39'64	
	<i>h</i> 39'24	<i>l</i> 36'88	<i>l</i> 37'78	<i>l</i> 38'72	<i>l</i> 37'50	<i>h</i> 38'82	<i>l</i> 37'08	<i>l</i> 36'78	<i>l</i> 39'10	<i>l</i> 40'42	
	<i>h</i> 36'46	<i>l</i> 37'02	<i>l</i> 38'04	<i>l</i> 39'02	<i>l</i> 36'82	<i>h</i> 38'86	<i>l</i> 36'88	<i>l</i> 37'46	<i>l</i> 38'32	<i>l</i> 38'68	
	<i>h</i> 37'88										
	<i>h</i> 37'04										
	37'59	36'98	37'70	38'65	37'15	38'98	37'39	37'69	38'79	39'58	

NOTE.—(XXIV) and (XXV) appertain to base-line figures.

At I—(Continued.)

December 1853, observed by Lieutenant J. F. Tennant and Mr. C. Lane with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on II										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 14'	187° 14'	14° 26'	194° 26'	21° 37'	201° 38'	28° 50'	208° 50'	
IV & III	"	"	"	"	"	"	"	"	"	"	M = 46''·10 w = 17·28 $\frac{1}{w}$ = 0·06 C = 52° 59' 46''·09
	h 46° 36	l 46° 88	l 45° 70	l 44° 42	l 45° 44	h 46° 70	h 46° 18	l 45° 52	l 46° 30	l 44° 42	
III & (XXV)	h 44° 80	l 46° 16	l 44° 62	l 45° 36	l 46° 84	h 45° 44	l 46° 76	l 47° 10	l 47° 32	l 43° 36	M = 36''·44 w = 15·40 $\frac{1}{w}$ = 0·06 C = 75° 33' 36''·44
	h 46° 36	l 46° 48	l 45° 58	l 45° 30	l 46° 58	h 45° 82	l 47° 32	l 46° 52	l 47° 22	l 46° 42	
(XXV) & (XXIV)	h 45° 30									l 47° 68	M = 4''·42 w = 26·76 $\frac{1}{w}$ = 0·04 C = 70° 46' 4''·42
	h 47° 00									l 47° 22	
(XXIV) & II	45° 96	46° 51	45° 30	45° 03	46° 29	45° 99	46° 75	46° 38	46° 95	45° 82	M = 54''·90 w = 9·10 $\frac{1}{w}$ = 0·11 C = 82° 9' 54''·90
	h 35° 58	l 34° 88	l 37° 60	l 37° 44	l 36° 88	h 35° 22	h 36° 74	l 36° 48	l 36° 88	l 37° 68	
(XXV) & (XXIV)	h 36° 16	l 35° 82	l 37° 94	l 37° 44	l 35° 18	h 35° 54	l 37° 38	l 36° 58	l 35° 72	l 37° 28	M = 4''·42 w = 26·76 $\frac{1}{w}$ = 0·04 C = 70° 46' 4''·42
	h 36° 68	l 36° 48	l 37° 32	l 36° 86	l 35° 48	h 35° 36	l 37° 28	l 35° 66	l 35° 76	l 35° 86	
(XXV) & (XXIV)	36° 14	35° 73	37° 62	37° 25	35° 85	35° 37	37° 13	36° 24	36° 12	36° 94	M = 4''·42 w = 26·76 $\frac{1}{w}$ = 0·04 C = 70° 46' 4''·42
	h 3° 16	l 6° 24	l 4° 84	l 4° 54	l 4° 24	h 4° 58	h 4° 96	l 4° 26	l 3° 32	l 4° 14	
(XXIV) & II	h 3° 96	l 4° 50	l 4° 72	l 3° 06	l 5° 02	h 4° 22	l 5° 08	l 2° 96	l 3° 40	l 4° 50	M = 54''·90 w = 9·10 $\frac{1}{w}$ = 0·11 C = 82° 9' 54''·90
	h 3° 74	l 4° 08	l 4° 26	l 4° 66	l 5° 62	h 4° 80	l 5° 14	l 4° 54	l 4° 56	l 5° 90	
(XXIV) & II	3° 62	4° 77	4° 61	4° 15	4° 96	4° 53	5° 06	3° 92	3° 76	4° 85	M = 54''·90 w = 9·10 $\frac{1}{w}$ = 0·11 C = 82° 9' 54''·90
	h 56° 62	l 54° 58	l 53° 22	l 54° 06	l 56° 42	h 54° 66	h 54° 16	l 55° 14	l 55° 90	l 53° 74	
(XXIV) & II	h 55° 62	l 55° 88	l 54° 60	l 54° 90	l 56° 88	h 55° 40	l 54° 34	l 55° 96	l 55° 50	l 53° 34	M = 54''·90 w = 9·10 $\frac{1}{w}$ = 0·11 C = 82° 9' 54''·90
	h 56° 56	l 55° 66	l 55° 08	l 54° 56	l 55° 06	h 54° 38	l 53° 08	l 55° 40	l 54° 04	l 52° 24	
(XXIV) & II	56° 27	55° 37	54° 30	54° 51	56° 12	54° 81	53° 86	55° 50	55° 15	53° 11	M = 54''·90 w = 9·10 $\frac{1}{w}$ = 0·11 C = 82° 9' 54''·90

NOTE.—(XXIV) and (XXV) appertain to base-line figures.

At II											
<i>November 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on V										M = Mean of Groups w = Relative Weight C = Concluded Angle
	213° 53'	33° 53'	221° 5'	41° 5'	228° 17'	48° 17'	235° 28'	55° 29'	242° 40'	62° 40'	
V & IV	"	"	"	"	"	"	"	"	"	"	M = 2''·18 w = 14·36 $\frac{1}{w}$ = 0·07 C = 55° 56' 2''·18
	h 3'70	h 1'72	h 2'32	l 2'66	l 1'82	l 2'54	l 1'90	l 3'64	h 0'48	h 1'76	
	h 2'82	h 1'98	h 1'76	l 3'28	l 2'78	l 1'24	l 0'84	l 2'64	h 0'94	h 1'84	
	h 2'56	h 0'30	h 2'74	l 1'32	l 3'86	l 1'56	l 2'18	l 3'34	h 1'68	h 2'08	
	3'03	1'33	2'27	2'80	2'82	1'78	1'64	3'21	1'03	1'89	
IV & I	h 20'94	h 21'60	h 23'46	l 22'64	l 24'52	l 23'74	l 24'08	l 23'88	h 26'96	h 24'64	M = 23''·49 w = 12·96 $\frac{1}{w}$ = 0·08 C = 46° 5' 23''·49
	h 21'58	h 23'50	h 23'52	l 21'60	l 22'48	l 24'58	l 25'36	l 24'26	h 23'58	h 22'52	
	h 23'76	h 22'20	h 22'58	l 24'14	l 23'38	l 24'00	l 23'24	l 24'22	h 23'82	h 23'90	
	h 23'16			l 23'42			l 24'18		h 23'68	h 23'66	
	h 22'28								h 24'02		
	22'34	22'43	23'19	22'95	23'46	24'11	24'22	24'12	24'41	23'68	
I & (XXIV)	h 40'88	h 38'76	h 38'34	l 39'06	l 39'36	l 37'86	l 38'96	l 36'86	h 36'48	h 34'16	M = 38''·16 w = 7·33 $\frac{1}{w}$ = 0·14 C = 44° 6' 38''·15
	h 39'72	h 38'48	h 37'72	l 38'44	l 39'40	l 36'56	l 38'30	l 37'90	h 37'96	h 36'04	
	h 39'88	h 39'78	h 38'10	l 37'80	l 38'00	l 38'04	l 38'60	l 37'54	h 37'20	h 36'92	
									h 37'06	h 37'28	
	40'16	39'01	38'05	38'43	38'92	37'49	38'62	37'43	37'21	36'29	
At III											
<i>December 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XXV)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 14'	187° 14'	14° 26'	194° 26'	21° 38'	201° 38'	28° 49'	208° 50'	
(XXV) & I	"	"	"	"	"	"	"	"	"	"	M = 48''·85 w = 11·60 $\frac{1}{w}$ = 0·09 C = 46° 36' 48''·84
	h 47'52	h 47'04	h 47'62	l 48'30	l 50'76	l 50'26	h 49'12	l 49'30	l 49'52	l 49'04	
	h 47'98	l 49'34	h 48'16	l 50'16	l 49'48	l 47'70	h 49'70	l 48'92	l 50'26	l 49'42	
	h 46'80	l 47'46	h 49'38	l 48'26	l 49'78	l 48'28	h 49'80	l 48'40	l 48'74	l 49'70	
		l 46'58				l 48'98					
	47'43	47'61	48'39	48'91	50'01	48'81	49'54	48'87	49'51	49'39	

NOTE.—(XXIV) and (XXV) appertain to base-line figures.

At III—(Continued.)											
<i>December 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on (XXV)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 14'	187° 14'	14° 26'	194° 26'	21° 38'	201° 38'	28° 49'	208° 50'	
I & IV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 39''86 <i>w</i> = 23 77 $\frac{1}{w}$ = 0.04 <i>C</i> = 51° 40' 39''86
	h40°48	h40°66	h39°16	l41°50	l39°46	l38°68	h39°24	l39°78	l38°94	l40°78	
	h40°96	l40°04	h39°70	l38°68	l39°90	l41°00	h39°22	l39°28	l39°72	l40°02	
	h41°20	l40°74	h39°32	l40°24	l39°72	l39°92	h38°24	l39°94	l40°38	l39°84	
			l40°30		l39°76						
	l38°72										
	40°88	40°48	39°39	39°89	39°69	39°84	38°90	39°67	39°68	40°21	
IV & VI	l55°70	h55°58	h55°80	l55°78	l56°36	l57°68	h57°86	l57°50	l57°26	l56°64	<i>M</i> = 56''50 <i>w</i> = 9 53 $\frac{1}{w}$ = 0.10 <i>C</i> = 55° 49' 56''50
	l56°72	l53°60	h56°24	l56°52	l55°98	l57°86	h56°94	l57°74	l56°38	l56°26	
	l54°50	l55°80	h54°84	l55°82	l56°46	l58°92	l56°72	l57°16	l57°68	l56°70	
	l55°70										
	55°66	54°99	55°63	56°04	56°27	58°15	57°17	57°47	57°11	56°53	
At IV											
<i>December 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on II										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 37'	201° 37'	28° 48'	208° 48'	
II & V	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 52''50 <i>w</i> = 27 63 $\frac{1}{w}$ = 0.04 <i>C</i> = 71° 44' 52''50
	h52°86	h53°08	l52°48	l52°14	h51°98	h51°92	l53°42	l52°72	h54°58	h52°96	
	h51°16	h52°34	l53°56	l52°14	h52°56	l53°76	l51°80	l51°68	h52°46	h53°58	
	h50°96	h51°24	l53°20	l53°32	h52°54	l52°88	l52°84	h51°68	h51°50	h52°54	
								h51°90			
								h52°20			
	51°66	52°22	53°08	52°53	52°36	52°85	52°69	52°03	52°53	53°03	

NOTE.—(XXV) appertains to base-line figures.

At IV—(Continued.)

December 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on II										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 37'	201° 37'	28° 48'	206° 48'	
V & VI	"	"	"	"	"	"	"	"	"	"	M = 51''68 w = 10.47 $\frac{1}{w} = 0.10$ C = 75° 46' 51''68
	h 51'12	h 51'16	l 51'40	l 52'02	h 51'54	h 53'12	l 51'90	l 50'66	h 50'40	h 51'92	
	h 51'44	h 49'34	l 49'94	l 52'54	h 51'10	l 52'86	l 52'58	l 53'10	h 51'78	h 52'64	
	h 49'46	h 50'94	l 50'22	l 52'94	h 51'34	l 52'64	l 52'08	h 53'42	h 52'36	h 52'42	
									h 50'46	h 52'56	
	50'67	50'48	50'52	52'50	51'33	52'87	52'19	52'39	51'51	52'33	
VI & III	h 39'94	h 41'82	l 41'52	l 40'12	h 40'32	h 40'46	l 40'00	l 38'66	h 39'30	h 40'00	M = 40''17 w = 7.26 $\frac{1}{w} = 0.14$ C = 81° 44' 40''17
	h 41'14	h 42'58	l 41'58	l 38'76	h 40'28	l 39'92	l 38'86	l 38'36	h 40'04	h 37'72	
	h 42'68	h 40'86	l 41'12	l 38'04	h 41'54	l 39'76	l 40'92	h 38'70	h 39'56	h 39'08	
	h 42'40								h 40'44		
	h 40'72										
	41'38	41'75	41'41	38'97	40'71	40'05	39'93	38'57	39'63	39'31	
III & I	h 35'52	h 33'94	l 35'02	l 36'62	h 36'06	h 36'46	l 36'28	l 39'26	h 35'64	h 37'40	M = 36''33 w = 13.22 $\frac{1}{w} = 0.08$ C = 75° 19' 36''34
	h 35'38	h 37'46	l 35'28	l 36'92	h 36'98	l 35'00	l 38'44	l 37'80	h 35'32	h 38'54	
	h 35'86	h 35'50	l 35'74	l 37'00	l 35'60	l 35'64	l 36'06	h 36'38	h 36'94	h 36'60	
	h 37'40						l 37'24	h 35'80			
	h 35'92							h 36'16			
	35'59	36'04	35'35	36'85	36'21	35'70	37'01	37'08	35'97	37'51	
I & II	h 59'54	h 61'88	l 59'84	l 57'62	h 60'62	h 58'58	l 58'18	l 58'20	h 60'16	h 58'26	M = 59''48 w = 6.73 $\frac{1}{w} = 0.15$ C = 55° 23' 59''48
	h 61'42	h 59'20	l 60'58	l 57'30	h 61'40	l 60'12	l 58'14	l 57'56	h 60'40	h 58'62	
	h 61'18	h 61'50	l 60'46	l 58'42	l 59'80	l 58'86	l 58'30	h 58'96	h 60'98	h 59'56	
	h 59'18										
	h 60'54										
	60'71	60'46	60'29	57'78	60'61	59'19	58'21	58'24	60'51	58'81	

At V											
<i>December 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on VII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 38'	201° 38'	23° 49'	206° 49'	
VII & VIII	"	"	"	"	"	"	"	"	"	"	
	<i>h</i> 32° 02'	<i>h</i> 32° 40'	<i>l</i> 32° 74'	<i>l</i> 35° 10'	<i>l</i> 32° 22'	<i>l</i> 33° 78'	<i>l</i> 33° 02'	<i>l</i> 34° 56'	<i>l</i> 32° 32'	<i>l</i> 34° 50'	<i>M</i> = 32'' 80
	<i>h</i> 32° 78'	<i>h</i> 31° 92'	<i>l</i> 32° 20'	<i>l</i> 33° 46'	<i>l</i> 31° 10'	<i>l</i> 32° 92'	<i>l</i> 33° 10'	<i>l</i> 32° 34'	<i>l</i> 31° 54'	<i>l</i> 32° 84'	<i>w</i> = 13 · 10
	<i>h</i> 31° 80'	<i>h</i> 32° 08'	<i>l</i> 31° 82'	<i>l</i> 33° 90'	<i>l</i> 32° 40'	<i>l</i> 32° 50'	<i>l</i> 32° 52'	<i>l</i> 33° 96'	<i>l</i> 32° 70'	<i>l</i> 35° 14'	$\frac{1}{w}$ = 0 · 08
								<i>l</i> 32° 38'		<i>l</i> 33° 26'	<i>C</i> = 37° 18' 32'' 81
	32° 20'	32° 13'	32° 25'	34° 15'	31° 91'	33° 07'	32° 88'	33° 31'	32° 19'	33° 94'	
VIII & VI	<i>h</i> 30° 12'	<i>h</i> 30° 20'	<i>l</i> 30° 02'	<i>l</i> 29° 26'	<i>l</i> 31° 12'	<i>l</i> 29° 62'	<i>l</i> 31° 04'	<i>l</i> 29° 14'	<i>l</i> 30° 72'	<i>l</i> 30° 68'	<i>M</i> = 30'' 32
	<i>h</i> 29° 94'	<i>h</i> 29° 82'	<i>l</i> 29° 52'	<i>l</i> 29° 72'	<i>l</i> 30° 64'	<i>l</i> 29° 34'	<i>l</i> 30° 58'	<i>l</i> 31° 82'	<i>l</i> 30° 00'	<i>l</i> 32° 70'	<i>w</i> = 21 · 10
	<i>h</i> 29° 80'	<i>h</i> 29° 44'	<i>l</i> 31° 42'	<i>l</i> 29° 28'	<i>l</i> 29° 04'	<i>l</i> 31° 66'	<i>l</i> 31° 44'	<i>l</i> 29° 64'	<i>l</i> 30° 76'	<i>l</i> 30° 56'	$\frac{1}{w}$ = 0 · 05
						<i>l</i> 29° 20'		<i>l</i> 31° 20'		<i>l</i> 31° 04'	<i>C</i> = 51° 14' 30'' 33
								<i>l</i> 31° 50'			
	29° 95'	29° 82'	30° 32'	29° 42'	30° 27'	29° 96'	31° 02'	30° 66'	30° 49'	31° 25'	
VI & IV	<i>h</i> 27° 34'	<i>h</i> 29° 82'	<i>l</i> 26° 30'	<i>l</i> 25° 94'	<i>l</i> 25° 94'	<i>l</i> 27° 88'	<i>l</i> 26° 68'	<i>l</i> 26° 04'	<i>h</i> 29° 56'	<i>h</i> 27° 12'	<i>M</i> = 27'' 26
	<i>h</i> 25° 78'	<i>h</i> 28° 32'	<i>l</i> 27° 18'	<i>l</i> 26° 00'	<i>l</i> 27° 66'	<i>l</i> 27° 80'	<i>l</i> 27° 12'	<i>l</i> 25° 50'	<i>h</i> 28° 86'	<i>h</i> 29° 20'	<i>w</i> = 7 · 12
	<i>h</i> 27° 30'	<i>h</i> 28° 22'	<i>l</i> 25° 04'	<i>l</i> 26° 82'	<i>l</i> 27° 12'	<i>l</i> 27° 28'	<i>l</i> 26° 84'	<i>l</i> 26° 10'	<i>h</i> 28° 86'	<i>h</i> 26° 62'	$\frac{1}{w}$ = 0 · 14
										<i>h</i> 29° 64'	<i>C</i> = 47° 17' 27'' 26
	26° 81'	28° 79'	26° 17'	26° 25'	26° 91'	27° 65'	26° 88'	25° 88'	29° 09'	28° 15'	
IV & II	<i>h</i> 9° 06'	<i>h</i> 6° 92'	<i>l</i> 9° 86'	<i>l</i> 9° 96'	<i>l</i> 9° 70'	<i>l</i> 7° 84'	<i>l</i> 10° 04'	<i>l</i> 11° 04'	<i>h</i> 7° 74'	<i>h</i> 6° 88'	<i>M</i> = 8'' 83
	<i>h</i> 10° 98'	<i>h</i> 8° 42'	<i>l</i> 9° 52'	<i>l</i> 10° 62'	<i>l</i> 8° 52'	<i>l</i> 9° 58'	<i>l</i> 8° 72'	<i>l</i> 10° 20'	<i>h</i> 5° 70'	<i>h</i> 6° 36'	<i>w</i> = 4 · 30
	<i>h</i> 9° 16'	<i>h</i> 8° 28'	<i>l</i> 10° 02'	<i>l</i> 10° 68'	<i>l</i> 10° 14'	<i>l</i> 8° 34'	<i>l</i> 9° 06'	<i>l</i> 9° 66'	<i>h</i> 6° 06'	<i>h</i> 5° 76'	$\frac{1}{w}$ = 0 · 23
	9° 73'	7° 87'	9° 80'	10° 42'	9° 45'	8° 59'	9° 27'	10° 30'	6° 50'	6° 33'	<i>C</i> = 52° 19' 8'' 83

At VI											
<i>December 1853, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on III										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 26'	194° 26'	21° 37'	201° 37'	28° 40'	208° 40'	
III & IV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 25'' 70 <i>w</i> = 14 10 $\frac{1}{w}$ = 0 07 <i>C</i> = 42° 25' 25'' 70
	h23° 86	l 24° 82	l 26° 62	h 25° 36	l 26° 36	l 26° 58	l 25° 20	h 26° 94	l 25° 44	l 26° 12	
	h24° 62	l 25° 66	l 25° 10	h 25° 58	l 25° 16	l 27° 12	l 26° 14	h 24° 86	l 25° 12	l 27° 86	
	h25° 86	l 24° 98	l 25° 26	l 26° 66	l 25° 72	l 26° 10	h 25° 04	h 24° 94	l 24° 04	l 27° 88	
	24° 78	25° 15	25° 66	25° 87	25° 75	26° 60	25° 46	25° 58	24° 87	27° 23	
IV & V	h45° 12	l 43° 36	l 43° 84	h 43° 90	l 43° 44	l 42° 34	l 44° 72	h 42° 36	l 43° 04	l 43° 38	<i>M</i> = 43'' 28 <i>w</i> = 11 95 $\frac{1}{w}$ = 0 08 <i>C</i> = 56° 55' 43'' 28
	h43° 32	l 43° 14	l 44° 90	h 41° 14	l 43° 44	l 41° 28	l 44° 22	h 42° 72	l 45° 36	l 42° 38	
	h43° 60	l 42° 74	l 43° 18	l 42° 42	l 41° 46	l 42° 28	h 44° 38	h 43° 20	l 43° 98	l 43° 40	
				l 42° 84					l 44° 58		
				l 42° 14							
	44° 01	43° 08	43° 97	42° 49	42° 78	41° 97	44° 44	42° 76	44° 24	43° 05	
V & VII	h45° 46	l 46° 90	l 44° 88	h 47° 46	l 46° 22	l 49° 06	l 46° 34	h 46° 80	l 48° 68	l 48° 06	<i>M</i> = 47'' 30 <i>w</i> = 10 23 $\frac{1}{w}$ = 0 10 <i>C</i> = 36° 18' 47'' 30
	h46° 98	l 46° 60	l 45° 86	h 48° 94	l 46° 50	l 48° 42	l 47° 52	h 46° 88	l 47° 00	l 47° 80	
	h46° 56	l 48° 58	l 46° 84	l 48° 28	l 47° 70	l 49° 08	h 46° 28	h 48° 38	l 48° 68	l 46° 50	
									l 47° 92		
	46° 33	47° 36	45° 86	48° 23	46° 81	48° 85	46° 71	47° 35	48° 07	47° 45	
VII & VIII	h48° 22	l 48° 10	l 49° 76	h 48° 48	l 48° 80	l 50° 26	l 49° 56	h 48° 48	l 47° 94	l 48° 26	<i>M</i> = 48'' 65 <i>w</i> = 16 70 $\frac{1}{w}$ = 0 06 <i>C</i> = 39° 24' 48'' 65
	h48° 74	l 48° 70	l 48° 94	h 49° 04	l 48° 52	l 49° 56	l 47° 78	h 49° 92	l 46° 72	l 48° 78	
	h47° 82	l 47° 80	l 49° 00	l 49° 12	l 49° 78	l 48° 60	h 48° 70	h 48° 94	l 46° 28	l 48° 98	
	48° 26	48° 20	49° 23	48° 88	49° 03	49° 47	48° 68	49° 11	46° 98	48° 67	



At VII											
<i>December 1853, and January 1854, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on IX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 26'	194° 26'	21° 37'	201° 37'	28° 40'	208° 40'	
IX & X	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 36''·66 <i>w</i> = 11·61 $\frac{1}{w}$ = 0·09 <i>C</i> = 31° 20' 36''·67
	h35°74	h35°80	l37°98	l35°70	l39°40	h38°52	l36°10	l37°58	l37°16	l36°16	
	h36°64	l37°30	l35°98	l36°32	l36°08	h38°22	l37°36	l34°80	l35°70	l35°86	
	h36°42	l35°08	l37°38	l34°80	l37°00	h37°66	l35°48	l35°58	l36°74	l37°62	
		l36°16			h38°60			l36°52			
					h39°26			l36°02			
				h36°96							
	36°27	36°09	37°11	35°61	37°88	38°13	36°31	36°10	36°53	36°55	
X & VIII	h25°30	h24°32	l24°70	l26°02	l25°66	h25°16	l25°52	l25°08	l25°24	l24°78	<i>M</i> = 24''·85 <i>w</i> = 22·83 $\frac{1}{w}$ = 0·04 <i>C</i> = 51° 32' 24''·84
	h23°58	h25°08	l23°12	l26°02	l24°82	h22°84	l24°60	l25°28	l25°00	l24°20	
	h24°02	l23°00	l25°72	l24°60	l25°40	h24°64	l26°40	l24°78	l25°34	l23°88	
		l24°32				l25°50					
		l25°44									
	24°30	24°13	24°66	25°55	25°29	24°54	25°51	25°05	25°19	24°29	
VIII & VI	h21°38	h21°22	l20°98	l20°18	l19°80	h20°84	l22°24	l21°84	l21°16	l22°70	<i>M</i> = 21''·28 <i>w</i> = 13·00 $\frac{1}{w}$ = 0·08 <i>C</i> = 53° 9' 21''·28
	h21°00	h21°52	l21°20	l20°60	l20°02	h21°16	l22°86	l21°06	l22°52	l22°54	
	h21°48	l21°44	l19°54	l20°06	l19°70	h21°92	l22°10	l21°52	l22°38	l21°54	
	21°29	21°39	20°57	20°28	19°84	21°31	22°40	21°47	22°02	22°26	
VI & V	h13°68	h12°86	l13°92	l13°90	l12°44	h13°60	l11°80	l9°90	l12°30	l11°38	<i>M</i> = 12''·72 <i>w</i> = 8·04 $\frac{1}{w}$ = 0·12 <i>C</i> = 55° 8' 12''·72
	h15°04	h13°48	l12°74	l13°18	l13°96	h13°06	l11°66	l11°60	l10°72	l11°10	
	h13°38	l13°02	l14°06	l13°30	l14°96	h12°56	l11°68	l12°48	l11°26	l12°76	
				l13°68			l11°24				
	14°03	13°12	13°57	13°46	13°76	13°07	11°71	11°31	11°43	11°75	

At VIII											
<i>January 1854, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on VI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 18'	14° 28'	194° 25'	21° 37'	201° 37'	28° 50'	208° 50'	
VI & V	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 56''88 <i>w</i> = 13 '00 $\frac{1}{w}$ = 0 '08 <i>C</i> = 53° 1' 56''88
	<i>h</i> 55'88	<i>l</i> 55'92	<i>l</i> 56'38	<i>l</i> 57'24	<i>h</i> 57'52	<i>l</i> 58'94	<i>l</i> 55'88	<i>l</i> 56'36	<i>l</i> 56'36	<i>l</i> 57'12	
	<i>h</i> 55'84	<i>l</i> 56'28	<i>l</i> 56'14	<i>l</i> 56'68	<i>h</i> 57'50	<i>l</i> 57'30	<i>l</i> 56'14	<i>l</i> 57'26	<i>l</i> 56'84	<i>l</i> 58'20	
	<i>h</i> 56'46	<i>l</i> 54'42	<i>l</i> 58'02	<i>l</i> 57'00	<i>h</i> 57'80	<i>l</i> 57'96	<i>l</i> 56'56	<i>l</i> 56'68	<i>l</i> 57'10	<i>l</i> 58'58	
	56'06	55'54	56'85	56'97	57'61	58'07	56'19	56'77	56'77	57'97	
V & VII	<i>h</i> 57'16	<i>l</i> 56'26	<i>l</i> 56'62	<i>l</i> 55'18	<i>h</i> 54'34	<i>l</i> 53'06	<i>l</i> 55'90	<i>l</i> 55'46	<i>l</i> 55'12	<i>l</i> 55'96	<i>M</i> = 55''42 <i>w</i> = 15 '50 $\frac{1}{w}$ = 0 '06 <i>C</i> = 34° 23' 55''42
	<i>h</i> 56'24	<i>l</i> 55'28	<i>l</i> 54'88	<i>l</i> 53'94	<i>h</i> 55'60	<i>l</i> 55'10	<i>l</i> 56'34	<i>l</i> 53'64	<i>l</i> 54'92	<i>l</i> 54'54	
	<i>h</i> 55'66	<i>l</i> 56'86	<i>l</i> 55'24	<i>l</i> 56'28	<i>h</i> 54'74	<i>l</i> 54'82	<i>l</i> 56'76	<i>l</i> 55'50	<i>l</i> 55'98	<i>l</i> 54'30	
				<i>h</i> 56'52							
	56'35	56'13	55'58	55'48	54'89	54'33	56'33	54'87	55'34	54'93	
VII & IX	<i>h</i> 27'36	<i>l</i> 28'32	<i>l</i> 27'70	<i>l</i> 28'30	<i>h</i> 28'30	<i>l</i> 28'14	<i>l</i> 28'48	<i>l</i> 30'00	<i>l</i> 26'48	<i>l</i> 27'42	<i>M</i> = 28''05 <i>w</i> = 25 '74 $\frac{1}{w}$ = 0 '04 <i>C</i> = 64° 40' 28''05
	<i>h</i> 28'32	<i>l</i> 27'30	<i>l</i> 28'86	<i>l</i> 28'98	<i>h</i> 27'02	<i>l</i> 29'40	<i>l</i> 27'96	<i>h</i> 28'28	<i>l</i> 26'72	<i>l</i> 27'68	
	<i>h</i> 28'46	<i>l</i> 27'76	<i>l</i> 28'30	<i>l</i> 26'88	<i>h</i> 28'70	<i>l</i> 28'20	<i>l</i> 27'90	<i>h</i> 28'70	<i>l</i> 27'74	<i>l</i> 28'40	
				<i>h</i> 27'34							
	28'05	27'79	28'29	27'88	28'01	28'58	28'11	28'99	26'98	27'83	
IX & X	<i>h</i> 38'64	<i>l</i> 37'22	<i>l</i> 37'66	<i>l</i> 37'40	<i>h</i> 36'74	<i>l</i> 37'20	<i>l</i> 39'10	<i>l</i> 37'22	<i>l</i> 38'50	<i>l</i> 38'58	<i>M</i> = 37''98 <i>w</i> = 22 '70 $\frac{1}{w}$ = 0 '04 <i>C</i> = 21° 22' 37''98
	<i>h</i> 37'08	<i>l</i> 38'72	<i>l</i> 38'68	<i>l</i> 39'00	<i>h</i> 37'82	<i>l</i> 36'38	<i>l</i> 38'82	<i>h</i> 38'16	<i>l</i> 39'46	<i>l</i> 38'06	
	<i>h</i> 38'96	<i>l</i> 37'24	<i>l</i> 37'86	<i>l</i> 38'46	<i>h</i> 37'26	<i>l</i> 37'00	<i>l</i> 37'38	<i>h</i> 38'60	<i>l</i> 38'38	<i>l</i> 37'72	
	38'23	37'73	38'07	38'29	37'27	36'86	38'43	37'99	38'78	38'12	
At IX											
<i>*February 1854, and †December 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 24'	21° 37'	201° 37'	28° 51'	208° 51'	
XI & XII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 40''32 <i>w</i> = 10 '44 $\frac{1}{w}$ = 0 '10 <i>C</i> = 48° 41' 40''32
	<i>h</i> 40'12	<i>l</i> 40'40	<i>l</i> 39'64	<i>l</i> 42'20	<i>l</i> 41'12	<i>l</i> 41'80	<i>l</i> 41'28	<i>l</i> 39'48	<i>l</i> 39'20	<i>l</i> 39'06	
	<i>l</i> 39'12	<i>l</i> 39'76	<i>l</i> 41'86	<i>l</i> 40'44	<i>l</i> 41'06	<i>l</i> 40'62	<i>l</i> 41'12	<i>l</i> 39'64	<i>l</i> 37'70	<i>l</i> 39'70	
	<i>l</i> 39'44	<i>l</i> 39'42	<i>l</i> 42'46	<i>l</i> 40'48	<i>l</i> 40'92	<i>l</i> 40'68	<i>l</i> 41'62	<i>l</i> 39'62	<i>l</i> 39'06	<i>l</i> 41'38	
			<i>l</i> 40'20								
	39'56	39'86	41'04	41'04	41'03	41'03	41'34	39'58	38'65	40'05	

At IX—(Continued.)											
*February 1854, and †December 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on XI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 24'	194° 24'	21° 37'	201° 37'	28° 51'	208° 51'	
† XII & X	"	"	"	"	"	"	"	"	"	"	
	h 16° 96	l 16° 58	l 17° 28	l 15° 80	l 16° 40	l 16° 22	l 18° 12	l 16° 92	l 19° 24	l 18° 88	M = 17" 11
	l 18° 60	l 17° 10	l 16° 32	l 16° 48	l 16° 18	l 15° 92	l 17° 20	l 16° 96	l 19° 78	l 17° 20	w = 7 01
	l 18° 04	l 17° 24	l 15° 84	l 15° 10	l 16° 10	l 16° 44	l 16° 20	l 15° 44	l 20° 06	l 17° 82	$\frac{1}{w} = 0 \cdot 14$
			l 17° 68								C = 59° 55' 17" 11
	17° 87	16° 97	16° 78	15° 79	16° 23	16° 19	17° 17	16° 44	19° 69	17° 97	
* X & VIII	l 24° 80	l 25° 06	l 26° 36	l 26° 42	l 25° 98	l 26° 72	l 26° 48	l 26° 46	l 27° 52	l 26° 54	M = 26" 46
	l 25° 86	l 25° 40	l 26° 78	l 27° 08	l 26° 20	l 26° 62	l 25° 70	l 24° 64	l 27° 46	l 26° 02	w = 17 30
	l 25° 96	l 25° 84	l 27° 44	l 28° 06	l 26° 58	l 26° 50	l 27° 58	l 26° 12	l 27° 00	l 28° 24	$\frac{1}{w} = 0 \cdot 06$
			l 27° 26								C = 28° 50' 26" 46
	25° 54	25° 43	26° 86	27° 19	26° 25	26° 61	26° 59	25° 74	27° 33	27° 02	
* VIII & VII	l 36° 20	l 34° 72	l 33° 92	l 33° 56	l 35° 34	l 36° 10	l 35° 80	l 35° 30	l 33° 02	l 37° 00	M = 34" 95
	l 35° 48	l 35° 90	l 34° 60	l 34° 68	l 35° 22	l 34° 44	l 37° 32	l 36° 22	l 32° 66	l 35° 78	w = 8 94
	l 34° 50	l 35° 50	l 34° 20	l 33° 36	l 34° 26	l 35° 64	l 36° 52	l 34° 74	l 33° 52	l 34° 24	$\frac{1}{w} = 0 \cdot 11$
			l 34° 04								C = 32° 26' 34" 95
	35° 39	35° 37	34° 24	33° 87	34° 94	35° 39	36° 55	35° 42	33° 07	35° 27	
At X											
January 1854, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on VIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 38'	201° 38'	28° 49'	208° 49'	
VIII & VII	"	"	"	"	"	"	"	"	"	"	
	h 32° 54	l 32° 50	l 30° 12	l 34° 04	l 30° 62	l 32° 62	l 31° 38	l 32° 80	l 31° 94	l 31° 90	M = 31" 96
	l 31° 62	l 32° 78	l 32° 34	l 32° 24	l 32° 46	l 32° 02	l 31° 36	l 31° 56	l 30° 70	l 32° 20	w = 21 44
	l 31° 48	l 32° 10	l 31° 80	l 32° 98	l 32° 60	l 32° 86	l 31° 78	l 31° 32	l 30° 64	l 30° 96	$\frac{1}{w} = 0 \cdot 05$
			l 31° 94								C = 42° 24' 31" 96
	31° 88	32° 46	31° 55	33° 09	31° 89	32° 50	31° 51	31° 89	31° 09	31° 69	

At X—(Continued.)											
<i>January 1854, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on VIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 38'	201° 38'	28° 49'	208° 49'	
VII & IX	"	"	"	"	"	"	"	"	"	"	M = 25'' 54 w = 14 '70 $\frac{1}{w}$ = 0 '07 C = 87° 22' 25'' 54
	h 24° 94	l 25° 36	l 25° 80	l 25° 12	l 27° 16	l 27° 14	l 25° 72	l 25° 96	l 26° 28	l 25° 74	
	l 25° 02	l 23° 62	l 24° 98	l 25° 64	l 25° 96	l 25° 98	l 25° 74	l 24° 64	l 27° 20	l 23° 96	
	l 24° 30	l 25° 34	l 25° 16	l 24° 64	l 24° 14	l 25° 22	l 26° 40	l 26° 24	l 27° 76	l 25° 20	
	24° 75	24° 77	25° 31	25° 13	25° 75	26° 11	25° 95	25° 61	27° 08	24° 97	
IX & XI	h 11° 68	h 12° 80	l 10° 60	h 10° 72	h 11° 52	h 13° 66	l 11° 44	l 12° 30	l 12° 24	l 14° 74	M = 12'' 41 w = 4 '92 $\frac{1}{w}$ = 0 '20 C = 35° 36' 12'' 41
	h 13° 02	h 10° 64	l 11° 30	h 8° 98	h 12° 92	h 13° 78	l 11° 28	l 11° 84	l 12° 58	l 15° 54	
	h 12° 50	h 10° 92	l 12° 48	h 11° 24	h 13° 08	h 14° 94	l 12° 64	l 12° 30	l 11° 58	l 14° 98	
				h 14° 36		l 12° 66					
	12° 40	11° 45	11° 46	10° 31	12° 97	14° 13	12° 01	12° 15	12° 13	15° 09	
XI & XII	h 3° 88	h 2° 74	l 6° 50	h 4° 52	h 5° 56	h 3° 92	l 8° 60	l 6° 04	l 6° 42	l 4° 58	M = 4'' 93 w = 7 '14 $\frac{1}{w}$ = 0 '14 C = 32° 56' 4'' 93
	h 3° 14	h 4° 54	l 5° 60	h 5° 30	h 4° 76	h 3° 62	l 6° 44	l 5° 56	l 6° 10	l 4° 54	
	h 3° 68	h 4° 28	l 5° 44	h 4° 18	h 4° 16	h 2° 80	l 5° 94	l 5° 78	l 6° 72	l 4° 44	
				h 4° 62		l 4° 46					
	3° 57	3° 85	5° 85	4° 67	4° 78	3° 45	6° 36	5° 79	6° 41	4° 52	
At XI											
<i>December 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XIII & XIV	"	"	"	"	"	"	"	"	"	"	M = 56'' 46 w = 20 '40 $\frac{1}{w}$ = 0 '05 C = 54° 6' 56'' 46
	h 56° 80	h 56° 66	l 56° 92	l 57° 34	l 56° 80	l 57° 64	l 55° 78	h 55° 88	l 56° 38	l 56° 66	
	h 56° 74	h 55° 78	l 56° 42	l 57° 56	l 56° 90	l 56° 74	l 55° 86	h 55° 32	l 55° 56	l 56° 44	
	h 56° 38	h 54° 64	l 57° 54	l 57° 42	l 56° 38	l 56° 94	l 56° 24	h 55° 86	l 55° 08	l 57° 24	
	56° 64	55° 69	56° 96	57° 44	56° 69	57° 11	55° 96	55° 69	55° 67	56° 78	

## At XI—(Continued.)

December 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on XIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XIV & XII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 7'' 90 <i>w</i> = 27 80 $\frac{1}{w}$ = 0 04 <i>C</i> = 60° 42' 7'' 90
	h 7' 28	h 7' 08	l 8' 30	l 7' 06	l 7' 08	l 6' 56	l 8' 22	h 8' 82	l 8' 06	l 8' 76	
	h 7' 42	h 6' 56	l 8' 34	l 7' 66	l 7' 44	l 7' 22	l 9' 02	h 8' 76	l 8' 04	l 8' 22	
	h 7' 84	h 8' 58	l 7' 48	l 7' 70	l 8' 18	l 6' 70	l 8' 56	h 7' 88	l 7' 76	l 8' 62	
	7' 51	7' 71	8' 04	7' 77	7' 57	6' 83	8' 60	8' 49	7' 95	8' 53	
XII & X	l 37' 28	l 38' 12	l 36' 50	l 36' 28	l 37' 78	l 38' 38	l 38' 16	l 36' 50	l 38' 20	l 37' 50	<i>M</i> = 37'' 17 <i>w</i> = 19 20 $\frac{1}{w}$ = 0 05 <i>C</i> = 40° 54' 37'' 17
	l 37' 52	l 36' 26	l 36' 48	l 36' 02	l 36' 64	l 36' 64	l 36' 32	l 36' 70	l 38' 20	l 37' 46	
	l 37' 04	l 36' 38	l 36' 52	l 35' 98	l 36' 92	l 38' 20	l 37' 44	l 36' 90	l 38' 80	l 37' 94	
	37' 28	36' 92	36' 50	36' 09	37' 11'	37' 74	37' 31	36' 70	38' 40	37' 63	
X & IX	l 51' 54	l 50' 98	l 50' 46	l 51' 20	l 51' 50	l 50' 52	l 49' 92	l 51' 94	l 50' 46	l 51' 70	<i>M</i> = 51'' 15 <i>w</i> = 31 30 $\frac{1}{w}$ = 0 03 <i>C</i> = 35° 46' 51'' 15
	l 51' 32	l 51' 90	l 51' 24	l 51' 74	l 52' 04	l 51' 24	l 50' 34	l 51' 74	l 51' 00	l 50' 96	
	l 51' 18	l 51' 94	l 51' 82	l 51' 72	l 52' 00	l 50' 24	l 50' 50	l 50' 92	l 50' 24	l 50' 12	
	51' 35	51' 61	51' 17	51' 55	51' 85	50' 67	50' 25	51' 53	50' 57	50' 93	

## At XII

December 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on X										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 38'	201° 38'	28° 50'	208° 50'	
X & IX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 26'' 76 <i>w</i> = 38 80 $\frac{1}{w}$ = 0 03 <i>C</i> = 51° 32' 26'' 76
	h 25' 74	l 25' 88	l 26' 88	l 27' 52	l 26' 86	l 26' 42	l 26' 56	l 26' 84	l 27' 38	l 26' 88	
	h 26' 28	l 28' 18	l 26' 20	l 27' 20	l 26' 00	l 26' 22	l 26' 02	l 26' 36	l 27' 86	l 26' 52	
	l 27' 28	l 26' 92	l 27' 24	l 27' 74	l 26' 44	l 26' 64	l 25' 82	l 26' 82	l 26' 54	l 26' 62	
		l 27' 60							l 27' 16		
	26' 43	27' 15	26' 77	27' 49	26' 43	26' 43	26' 13	26' 67	27' 26	26' 80	

At XII—(Continued.)											
<i>December 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on X										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 38'	201° 38'	28° 50'	208° 50'	
IX & XI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 52''·71 <i>w</i> = 6·32 $\frac{1}{w}$ = 0·16 <i>C</i> = 54° 36' 52''·71
	h 54° 12	l 51° 42	l 52° 36	l 51° 18	l 53° 66	l 52° 36	l 55° 74	l 53° 32	l 51° 96	l 52° 64	
	h 53° 42	l 51° 08	l 52° 16	l 50° 94	l 54° 24	l 52° 76	l 55° 14	l 53° 18	l 53° 00	l 52° 80	
	l 52° 86	l 52° 16	l 51° 14	l 50° 58	l 52° 94	l 52° 52	l 55° 10	l 51° 76	l 52° 38	l 52° 88	
		l 51° 42								l 52° 34	
	53° 47	51° 52	51° 89	50° 90	53° 61	52° 55	55° 33	52° 75	52° 45	52° 67	
XI & XIII	l 33° 68	h 34° 42	l 33° 34	l 34° 36	h 33° 24	h 34° 26	h 33° 84	h 33° 06	l 34° 06	l 35° 36	<i>M</i> = 33''·68 <i>w</i> = 10·40 $\frac{1}{w}$ = 0·10 <i>C</i> = 33° 27' 33''·68
	l 33° 32	h 35° 82	l 32° 34	l 34° 46	h 32° 34	h 33° 34	h 33° 20	h 33° 26	l 33° 22	l 34° 34	
	l 32° 98	h 33° 20	l 32° 14	l 35° 74	h 32° 44	l 33° 86	h 32° 04	l 32° 46	l 34° 34	l 35° 78	
	33° 33	34° 48	32° 61	34° 85	32° 67	33° 82	33° 03	32° 93	33° 87	35° 16	
XIII & XIV	l 34° 90	h 35° 54	l 35° 82	l 35° 12	h 34° 16	h 34° 06	h 35° 36	h 35° 72	l 35° 46	l 35° 96	<i>M</i> = 35''·27 <i>w</i> = 27·00 $\frac{1}{w}$ = 0·04 <i>C</i> = 29° 58' 35''·27
	h 34° 56	h 34° 12	l 35° 72	l 34° 40	h 35° 88	h 34° 96	h 34° 28	h 35° 48	l 34° 64	l 35° 96	
	l 36° 42	h 35° 38	l 35° 24	l 34° 60	h 34° 06	l 35° 62	h 36° 72	l 37° 34	l 35° 96	l 34° 54	
	35° 29	35° 01	35° 59	34° 71	34° 70	34° 88	35° 45	36° 18	35° 35	35° 49	
At XIII											
<i>January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 28'	194° 28'	21° 37'	201° 37'	28° 49'	208° 49'	
XV & XVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 3''·97 <i>w</i> = 7·22 $\frac{1}{w}$ = 0·14 <i>C</i> = 46° 8' 3''·97
	h 2° 54	l 1° 68	l 4° 42	l 5° 52	l 4° 16	l 5° 26	l 5° 02	l 4° 88	h 5° 98	l 3° 94	
	h 2° 76	l 0° 78	l 3° 62	l 3° 90	l 3° 34	l 6° 14	l 3° 60	l 4° 52	h 3° 62	l 4° 96	
	h 3° 76	l 1° 80	l 3° 96	l 3° 26	l 4° 22	l 5° 16	l 3° 76	l 5° 66	h 3° 28	l 3° 82	
				l 3° 58							
	3° 02	1° 42	4° 00	4° 23	3° 83	5° 52	4° 13	5° 02	4° 29	4° 24	

At XIII—(Continued.)											
<i>January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 28'	194° 25'	21° 37'	201° 37'	28° 48'	208° 48'	
XVI & XIV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 54'' 42 <i>w</i> = 8 '92 $\frac{1}{w}$ = 0 '11 <i>w</i> <i>C</i> = 46° 33' 54'' 42
	h 55° 88	l 54° 58	l 54° 72	l 52° 70	l 56° 42	l 53° 06	l 54° 04	l 53° 28	h 52° 48	l 55° 92	
	h 55° 50	l 54° 66	l 55° 32	l 53° 30	l 55° 50	l 53° 18	l 54° 76	l 52° 64	h 54° 66	l 55° 24	
	h 55° 64	l 54° 44	l 54° 70	l 54° 18	l 54° 26	l 53° 52	l 54° 94	l 52° 94	h 54° 38	l 55° 90	
				l 55° 20							
	55° 67	54° 56	54° 91	53° 39	55° 35	53° 25	54° 58	52° 95	53° 84	55° 69	
XIV & XII	h 32° 12	h 31° 68	l 31° 60	l 33° 64	l 30° 84	l 33° 40	l 29° 84	l 32° 22	h 32° 54	l 30° 78	<i>M</i> = 32'' 04 <i>w</i> = 9 '93 $\frac{1}{w}$ = 0 '10 <i>w</i> <i>C</i> = 32° 54' 32'' 04
	h 31° 86	l 32° 28	l 31° 80	l 34° 00	l 31° 96	l 32° 80	l 29° 82	l 32° 56	h 32° 02	l 31° 36	
	h 32° 00	l 31° 78	l 32° 56	l 32° 44	l 33° 72	l 33° 38	l 31° 36	l 32° 24	l 32° 10	l 29° 84	
				l 33° 02							
	31° 99	31° 91	31° 99	33° 36	32° 39	33° 19	30° 34	32° 34	32° 22	30° 66	
XII & XI	h 23° 16	h 22° 22	l 23° 82	l 22° 80	l 21° 60	l 22° 52	l 26° 16	l 22° 66	h 21° 62	l 24° 40	<i>M</i> = 23'' 02 <i>w</i> = 6 '91 $\frac{1}{w}$ = 0 '14 <i>w</i> <i>C</i> = 31° 43' 23'' 02
	h 22° 86	l 23° 88	l 24° 08	l 21° 92	l 21° 40	l 22° 56	l 26° 32	l 22° 46	h 21° 42	l 22° 66	
	h 23° 68	l 23° 80	l 23° 04	l 23° 48	l 21° 64	l 21° 66	l 24° 58	l 23° 40	l 22° 94	l 22° 24	
				l 21° 04							
	23° 23	23° 30	23° 65	22° 73	21° 42	22° 25	25° 69	22° 84	21° 99	23° 10	
At XIV											
<i>December 1855, and January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	242° 54'	62° 54'	250° 7'	70° 7'	257° 19'	77° 19'	264° 31'	84° 31'	271° 43'	91° 43'	
XII & XI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 44'' 54 <i>w</i> = 6 '59 $\frac{1}{w}$ = 0 '15 <i>w</i> <i>C</i> = 55° 51' 44'' 55
	l 46° 28	l 45° 22	l 43° 12	l 45° 64	l 47° 40	l 45° 16	h 44° 06	h 44° 32	h 42° 04	h 43° 36	
	l 45° 04	l 43° 86	l 45° 10	l 45° 38	l 45° 06	l 45° 38	h 43° 32	l 45° 64	h 44° 54	h 41° 54	
	l 44° 86	l 43° 66	l 46° 16	l 46° 48	l 44° 02	l 45° 72	h 44° 48	l 44° 44	h 43° 62	h 41° 64	
			l 43° 96		l 45° 18	l 46° 24					
	45° 39	44° 25	44° 59	45° 83	45° 42	45° 63	43° 95	44° 80	43° 40	42° 18	

At XIV—(Continued.)											
<i>December 1855, and January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	242° 54'	62° 54'	250° 7'	70° 7'	257° 19'	77° 19'	264° 31'	84° 31'	271° 43'	91° 43'	
XI & XIII	"	"	"	"	"	"	"	"	"	"	M = 9" 48 w = 20 52 $\frac{1}{w}$ = 0 05 C = 61° 15' 9" 48
	l 9° 42	l 10° 96	l 9° 18	l 10° 14	l 9° 46	l 8° 22	h 8° 38	h 9° 54	h 10° 38	h 8° 66	
	l 9° 24	l 10° 50	l 9° 22	l 8° 86	l 9° 20	l 8° 28	h 8° 44	l 10° 04	h 8° 58	h 9° 70	
	l 11° 20	l 10° 88	l 9° 46	l 8° 96	l 9° 46	l 8° 66	h 9° 60	l 10° 06	h 9° 88	h 9° 32	
	l 9° 34		l 9° 34		l 9° 60	l 8° 62					
	9° 95	10° 78	9° 30	9° 32	9° 43	8° 45	8° 81	9° 91	9° 61	9° 23	
XIII & XV	h 50° 60	h 49° 46	h 51° 96	l 50° 16	l 48° 14	l 49° 96	l 50° 06	l 50° 52	l 49° 94	h 50° 62	M = 49" 93 w = 11 04 $\frac{1}{w}$ = 0 09 C = 38° 22' 49" 93
	h 50° 12	h 48° 90	l 49° 92	l 51° 94	l 48° 16	l 50° 06	l 48° 80	l 48° 80	l 51° 02	l 50° 96	
	h 50° 16	l 48° 42	l 49° 76	l 51° 58	l 49° 08	l 49° 12	l 49° 04	l 48° 94	l 50° 86	l 50° 76	
			l 50° 66								
	50° 29	48° 93	50° 55	51° 23	48° 46	49° 71	49° 30	49° 42	50° 61	50° 75	
XV & XVI	h 44° 00	h 46° 96	h 46° 14	l 46° 56	l 47° 76	l 47° 62	l 46° 92	l 46° 20	l 45° 86	h 47° 18	M = 46" 43 w = 9 42 $\frac{1}{w}$ = 0 11 C = 35° 25' 46" 43
	h 43° 58	h 46° 54	l 47° 26	l 45° 06	l 47° 82	l 47° 00	l 46° 80	l 46° 24	l 46° 16	l 48° 42	
	h 44° 84	l 47° 38	l 47° 04	l 45° 70	l 46° 68	l 46° 50	l 46° 44	l 46° 92	l 45° 08	l 47° 02	
			l 46° 54								
	44° 14	46° 96	46° 81	45° 77	47° 42	47° 04	46° 72	46° 45	45° 70	47° 29	
At XV											
<i>January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 28'	194° 26'	21° 38'	201° 38'	28° 49'	206° 49'	
XVII & XVIII	"	"	"	"	"	"	"	"	"	"	M = 33" 73 w = 4 70 $\frac{1}{w}$ = 0 21 C = 41° 43' 33" 73
	l 33° 72	l 31° 00	l 33° 38	l 32° 98	l 34° 12	l 35° 42	l 34° 84	l 35° 22	l 33° 54	l 35° 72	
	l 32° 22	l 30° 62	l 31° 84	l 32° 10	l 33° 88	l 35° 28	l 36° 06	l 35° 02	l 33° 56	l 33° 94	
	l 33° 06	l 31° 28	l 31° 96	l 34° 46	l 33° 66	l 35° 46	l 34° 82	l 34° 02	l 33° 02	l 35° 66	
							l 34° 62				
	33° 00	30° 97	32° 39	33° 18	33° 89	35° 39	35° 24	34° 72	33° 37	35° 11	



## OBSERVED ANGLES.

41—D.

At XV—(Continued.)											
January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on XVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 26'	194° 26'	21° 38'	201° 38'	28° 49'	208° 49'	
XVIII & XVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 36".12 <i>w</i> = 9.94 $\frac{1}{w}$ = 0.10 <i>C</i> = 44° 25' 36".11
	l 35.52	l 37.74	l 36.42	l 36.56	l 35.80	l 35.30	l 35.92	l 32.48	l 37.08	l 35.24	
	l 37.62	l 36.56	l 36.36	l 37.84	l 34.96	l 35.72	l 35.04	l 34.58	l 37.50	l 36.68	
	l 36.92	l 36.74	l 36.84	l 35.22	l 35.10	l 35.06	l 36.72	l 35.46	l 38.00	l 35.76	
							l 35.44				
	36.69	37.01	36.54	36.54	35.29	35.36	35.89	34.49	37.53	35.89	
XVI & XIV	l 2.74	l 3.92	l 4.08	l 4.24	l 3.24	l 5.06	l 2.32	l 6.02	l 4.26	l 3.06	<i>M</i> = 3".95 <i>w</i> = 11.85 $\frac{1}{w}$ = 0.08 <i>C</i> = 37° 21' 3".95
	l 3.38	l 4.72	l 5.36	l 3.26	l 4.10	l 3.36	l 3.66	l 4.06	l 3.58	l 3.02	
	l 3.68	l 5.42	l 5.24	l 5.30	l 3.44	l 3.82	l 2.58	l 5.86	l 1.72	l 3.14	
								l 4.14			
	3.27	4.69	4.89	4.27	3.59	4.08	2.85	5.31	3.43	3.07	
XIV & XIII	l 13.08	l 12.80	l 12.82	l 12.60	l 12.82	l 11.54	l 12.66	l 12.58	l 11.34	l 13.52	<i>M</i> = 12".36 <i>w</i> = 31.62 $\frac{1}{w}$ = 0.03 <i>C</i> = 48° 55' 12".35
	l 13.26	l 13.06	l 11.92	l 12.84	l 12.58	l 12.62	l 10.70	l 12.52	l 11.32	l 11.98	
	l 13.20	l 12.38	l 11.54	l 11.24	l 12.86	l 12.14	l 11.78	l 12.02	l 13.04	l 12.54	
								l 11.32			
	13.18	12.75	12.09	12.23	12.75	12.10	11.71	12.37	11.76	12.68	
At XVI											
January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on XIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 14'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	208° 49'	
XIV & XIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 30".51 <i>w</i> = 8.60 $\frac{1}{w}$ = 0.12 <i>C</i> = 59° 37' 30".51
	l 30.20	l 28.58	l 29.96	l 28.88	l 31.94	l 30.78	l 32.08	l 29.84	l 32.06	l 30.24	
	l 31.08	l 28.48	l 31.46	l 29.62	l 30.44	l 31.26	l 31.64	l 29.36	l 31.80	l 29.58	
	l 31.78	l 29.18	l 30.94	l 28.62	l 30.18	l 30.98	l 31.16	l 30.96	l 31.92	l 30.26	
	31.02	28.75	30.79	29.04	30.85	31.01	31.63	30.05	31.93	30.03	

## GREAT INDUS SERIES.

At XVI—(Continued.)											
<i>January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle reading, telescope being set on XIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 14'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	206° 49'	
XIII & XIV	"	"	"	"	"	"	"	"	"	"	M = 40'' 89 w = 22 70 $\frac{1}{w} = 0 \cdot 04$ C = 47° 35' 40'' 89
	l 41' 10	l 40' 38	l 42' 66	l 41' 52	l 40' 30	l 41' 18	l 40' 24	l 41' 40	l 39' 72	l 41' 26	
	l 39' 68	l 39' 66	l 42' 16	l 40' 64	l 41' 00	l 40' 72	l 41' 10	l 40' 68	l 40' 80	l 41' 06	
	l 41' 24	l 39' 68	l 41' 62	l 40' 76	l 40' 92	l 39' 88	l 41' 72	l 41' 66	l 40' 40	l 41' 40	
	40' 67	39' 91	42' 15	40' 97	40' 74	40' 59	41' 02	41' 25	40' 31	41' 24	
XV & XVII	"	"	"	"	"	"	"	"	"	"	M = 46'' 10 w = 13 23 $\frac{1}{w} = 0 \cdot 08$ C = 54° 38' 46'' 10
	l 45' 76	l 46' 18	l 46' 10	l 47' 54	l 46' 44	l 45' 32	l 45' 40	l 45' 16	l 46' 72	l 47' 38	
	l 46' 34	l 47' 30	l 45' 52	l 47' 34	l 46' 64	l 46' 64	l 44' 40	l 45' 48	l 45' 32	l 46' 28	
	l 45' 10	l 47' 32	l 45' 78	l 47' 10	l 46' 68	l 46' 26	l 43' 58	l 45' 48	l 46' 18	l 45' 80	
									l 46' 92		
	45' 73	46' 93	45' 80	47' 33	46' 59	46' 07	44' 46	45' 37	46' 07	46' 60	
XVII & XVIII	"	"	"	"	"	"	"	"	"	"	M = 1'' 65 w = 25 28 $\frac{1}{w} = 0 \cdot 04$ C = 33° 38' 1'' 64
	l 62' 96	l 62' 44	l 61' 24	l 61' 40	l 60' 64	l 61' 84	l 61' 70	l 62' 18	l 61' 98	l 59' 30	
	l 61' 82	l 62' 52	l 61' 94	l 60' 10	l 61' 78	l 61' 76	l 61' 34	l 62' 70	l 62' 34	l 61' 90	
	l 60' 96	l 61' 90	l 60' 16	l 61' 94	l 61' 82	l 60' 62	l 62' 40	l 61' 84	l 62' 38	l 61' 18	
									l 61' 40		
	61' 91	62' 29	61' 11	61' 15	61' 41	61' 41	61' 81	62' 24	62' 23	60' 95	
At XVII											
<i>January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XIX & XX	"	"	"	"	"	"	"	"	"	"	M = 15'' 52 w = 20 40 $\frac{1}{w} = 0 \cdot 05$ C = 54° 17' 15'' 52
	l 14' 00	l 15' 54	l 16' 56	l 15' 18	l 15' 26	l 15' 72	l 17' 46	l 15' 18	l 14' 38	l 16' 08	
	l 14' 72	l 13' 62	l 16' 22	l 15' 20	l 15' 24	l 16' 34	l 15' 80	l 15' 00	l 15' 48	l 16' 06	
	l 15' 12	l 15' 78	l 15' 00	l 15' 54	l 14' 96	l 16' 62	l 15' 82	l 15' 02	l 16' 06	l 16' 72	
	14' 61	14' 98	15' 93	15' 31	15' 15	16' 23	16' 36	15' 07	15' 31	16' 29	

## OBSERVED ANGLES.

43—D.

## At XVII—(Continued.)

January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on XIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XX & XVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 55''·78 <i>w</i> = 31·30 $\frac{1}{w}$ = 0·03 <i>C</i> = 64° 16' 55''·78
	l 55'34	l 55'74	l 55'98	l 55'98	l 56'14	l 57'18	l 54'80	l 56'42	l 56'12	l 56'06	
	l 55'52	l 55'26	l 56'00	l 56'30	l 56'52	l 56'38	l 55'30	l 56'48	l 55'08	l 55'46	
	l 54'98	l 55'02	l 55'84	l 56'20	l 56'62	l 55'64	l 55'20	l 56'24	l 55'02	l 54'66	
	55'28	55'34	55'94	56'16	56'43	56'40	55'10	56'38	55'41	55'39	
XVIII & XVI	l 23'74	l 23'84	l 23'30	l 23'22	l 24'26	l 22'72	l 22'66	l 23'24	l 23'34	l 24'08	<i>M</i> = 23''·76 <i>w</i> = 32·30 $\frac{1}{w}$ = 0·03 <i>C</i> = 33° 53' 23''·76
	l 24'62	l 24'38	l 24'10	l 23'52	l 24'20	l 23'42	l 22'30	l 23'42	l 24'12	l 24'00	
	l 24'68	l 24'14	l 24'66	l 23'80	l 23'86	l 24'56	l 22'72	l 23'90	l 24'08	l 23'92	
	24'35	24'12	24'02	23'51	24'11	23'57	22'56	23'52	23'85	24'00	
XVI & XV	l 4'16	l 4'20	l 3'28	l 4'40	l 3'36	l 4'16	l 4'64	l 5'60	l 3'92	l 4'98	<i>M</i> = 4''·13 <i>w</i> = 10·40 $\frac{1}{w}$ = 0·10 <i>C</i> = 39° 12' 4''·13
	l 3'00	l 4'26	l 2'14	l 4'26	l 2'20	l 3'34	l 4'82	l 5'88	l 3'44	l 6'14	
	l 3'66	l 4'80	l 3'36	l 3'94	l 3'56	l 2'60	l 5'26	l 4'66	l 4'22	l 5'72	
	3'61	4'42	2'93	4'20	3'04	3'37	4'91	5'38	3'86	5'61	

## At XVIII

January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on XVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XVI & XV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 36''·18 <i>w</i> = 25·82 $\frac{1}{w}$ = 0·04 <i>C</i> = 47° 17' 36''·18
	l 37'18	l 35'26	l 36'08	l 36'34	l 36'46	l 35'96	l 37'04	l 35'78	l 36'82	l 37'38	
	l 34'66	l 35'06	l 35'88	l 35'56	l 37'04	l 36'40	l 36'88	l 35'48	l 36'16	l 36'66	
	l 35'32	l 35'26	l 35'76	l 36'60	l 36'54	l 36'42	l 37'02	l 35'88	l 36'30	l 36'50	
	l 35'72	l 35'28									
	35'63	35'19	35'91	36'17	36'68	36'26	36'98	35'71	36'43	36'85	

GREAT INDUS SERIES.

At XVIII—(Continued.)											
<i>January 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XV & XVII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 58''·78 <i>w</i> = 15 ·65 $\frac{1}{w}$ = 0 ·06 <i>C</i> = 65° 10' 58''·78
	<i>l</i> 59°02	<i>l</i> 57°30	<i>l</i> 59°46	<i>l</i> 59°94	<i>l</i> 58°40	<i>l</i> 59°28	<i>l</i> 59°70	<i>l</i> 57°96	<i>l</i> 59°72	<i>l</i> 59°06	
	<i>l</i> 59°82	<i>l</i> 57°24	<i>l</i> 59°10	<i>l</i> 59°38	<i>l</i> 57°82	<i>l</i> 58°24	<i>l</i> 58°88	<i>l</i> 57°78	<i>l</i> 58°94	<i>l</i> 59°32	
	<i>l</i> 59°40	<i>l</i> 56°98	<i>l</i> 58°04	<i>l</i> 59°56	<i>l</i> 58°80	<i>l</i> 58°26	<i>l</i> 58°84	<i>l</i> 58°82	<i>l</i> 59°76	<i>l</i> 57°90	
	<i>l</i> 60°16										
	<i>l</i> 59°66										
	59°61	57°17	58°87	59°63	58°34	58°59	59°14	58°19	59°47	58°76	
XVII & XIX	<i>l</i> 14°32	<i>l</i> 17°22	<i>l</i> 15°70	<i>l</i> 15°18	<i>l</i> 16°50	<i>l</i> 15°60	<i>l</i> 16°20	<i>l</i> 17°24	<i>l</i> 13°36	<i>l</i> 15°84	<i>M</i> = 16''·12 <i>w</i> = 9 ·24 $\frac{1}{w}$ = 0 ·11 <i>C</i> = 31° 42' 16''·12
	<i>l</i> 14°84	<i>l</i> 18°92	<i>l</i> 15°04	<i>l</i> 15°86	<i>l</i> 16°38	<i>l</i> 15°54	<i>l</i> 16°96	<i>l</i> 18°10	<i>l</i> 16°34	<i>l</i> 16°56	
	<i>l</i> 16°14	<i>l</i> 17°70	<i>l</i> 15°26	<i>l</i> 14°86	<i>l</i> 16°04	<i>l</i> 15°84	<i>l</i> 16°36	<i>l</i> 17°26	<i>l</i> 16°34	<i>l</i> 16°16	
			<i>l</i> 15°68						<i>l</i> 14°82		
	15°10	17°95	15°42	15°30	16°31	15°66	16°51	17°53	15°22	16°19	
XIX & XX	<i>l</i> 14°50	<i>l</i> 14°16	<i>l</i> 12°20	<i>l</i> 12°14	<i>l</i> 13°10	<i>l</i> 16°60	<i>l</i> 14°24	<i>l</i> 14°66	<i>l</i> 14°38	<i>l</i> 12°84	<i>M</i> = 13''·99 <i>w</i> = 9 ·48 $\frac{1}{w}$ = 0 ·11 <i>C</i> = 31° 29' 13''·99
	<i>l</i> 14°80	<i>l</i> 13°16	<i>l</i> 14°30	<i>l</i> 12°54	<i>l</i> 14°30	<i>l</i> 15°96	<i>l</i> 13°74	<i>l</i> 12°84	<i>l</i> 13°44	<i>l</i> 13°20	
	<i>l</i> 15°16	<i>l</i> 15°04	<i>l</i> 14°84	<i>l</i> 13°04	<i>l</i> 13°50	<i>l</i> 15°92	<i>l</i> 12°76	<i>l</i> 14°28	<i>l</i> 12°30	<i>l</i> 14°42	
			<i>l</i> 14°04						<i>l</i> 14°66		
	14°82	14°12	13°85	12°57	13°63	16°16	13°58	13°93	13°70	13°49	
At XIX											
<i>February 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XXII & XXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 41''·43 <i>w</i> = 27 ·33 $\frac{1}{w}$ = 0 ·04 <i>C</i> = 49° 30' 41''·42
	<i>l</i> 42°84	<i>l</i> 39°70	<i>l</i> 41°40	<i>l</i> 42°04	<i>h</i> 42°04	<i>h</i> 41°08	<i>l</i> 41°90	<i>l</i> 40°56	<i>l</i> 40°64	<i>l</i> 41°06	
	<i>l</i> 41°50	<i>l</i> 41°60	<i>l</i> 41°98	<i>l</i> 41°40	<i>h</i> 42°80	<i>h</i> 41°98	<i>l</i> 40°68	<i>l</i> 42°00	<i>l</i> 42°02	<i>l</i> 40°90	
	<i>l</i> 41°30	<i>l</i> 41°30	<i>l</i> 42°14	<i>l</i> 40°84	<i>h</i> 41°86	<i>h</i> 41°10	<i>l</i> 40°02	<i>l</i> 40°36	<i>l</i> 40°46	<i>l</i> 43°10	
						<i>l</i> 41°24					
	41°88	40°87	41°84	41°43	42°23	41°39	40°96	40°97	41°04	41°69	

OBSERVED ANGLES.

At XIX—(Continued.)											
<i>February 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XXI & XX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 37''·54 <i>w</i> = 12 ·02 $\frac{1}{w}$ = 0 ·08 <i>C</i> = 70° 34' 37''·54
	<i>l</i> 37'64	<i>l</i> 37'54	<i>l</i> 36'70	<i>l</i> 38'02	<i>h</i> 39'82	<i>h</i> 38'80	<i>l</i> 37'24	<i>l</i> 38'30	<i>l</i> 37'60	<i>l</i> 37'92	
	<i>l</i> 36'40	<i>l</i> 35'34	<i>l</i> 36'82	<i>l</i> 37'82	<i>h</i> 37'60	<i>h</i> 38'84	<i>l</i> 37'70	<i>l</i> 38'24	<i>l</i> 36'26	<i>l</i> 37'90	
	<i>l</i> 37'40	<i>l</i> 35'50	<i>l</i> 36'98	<i>l</i> 37'88	<i>h</i> 38'08	<i>h</i> 38'00	<i>l</i> 37'82	<i>l</i> 39'46	<i>l</i> 37'56	<i>l</i> 36'18	
		<i>l</i> 35'34			<i>h</i> 37'46		<i>l</i> 38'00				
	37'15	35'93	36'83	37'91	38'24	38'55	37'69	38'67	37'14	37'33	
XX & XVIII	<i>l</i> 16'86	<i>l</i> 18'04	<i>l</i> 18'02	<i>l</i> 17'22	<i>h</i> 18'02	<i>h</i> 17'64	<i>l</i> 17'26	<i>l</i> 16'68	<i>l</i> 17'68	<i>l</i> 16'82	<i>M</i> = 17''·55 <i>w</i> = 22 ·70 $\frac{1}{w}$ = 0 ·04 <i>C</i> = 36° 26' 17''·55
	<i>l</i> 17'22	<i>l</i> 17'00	<i>l</i> 19'00	<i>l</i> 16'76	<i>h</i> 17'18	<i>h</i> 17'08	<i>l</i> 17'24	<i>l</i> 16'68	<i>l</i> 17'86	<i>l</i> 17'02	
	<i>l</i> 15'30	<i>l</i> 18'40	<i>l</i> 18'42	<i>l</i> 18'70	<i>h</i> 18'42	<i>h</i> 18'70	<i>l</i> 18'78	<i>l</i> 17'38	<i>l</i> 17'04	<i>l</i> 18'16	
	16'46	17'81	18'48	17'56	17'87	17'81	17'76	16'91	17'53	17'33	
XVIII & XVII	<i>l</i> 33'96	<i>l</i> 31'82	<i>l</i> 33'40	<i>l</i> 34'02	<i>h</i> 33'36	<i>h</i> 35'56	<i>l</i> 32'60	<i>l</i> 33'20	<i>l</i> 33'28	<i>l</i> 32'76	<i>M</i> = 33''·49 <i>w</i> = 14 ·10 $\frac{1}{w}$ = 0 ·07 <i>C</i> = 29° 43' 33''·49
	<i>l</i> 35'18	<i>l</i> 33'54	<i>l</i> 33'24	<i>l</i> 34'40	<i>h</i> 35'00	<i>h</i> 34'32	<i>l</i> 33'00	<i>l</i> 32'48	<i>l</i> 34'04	<i>l</i> 34'02	
	<i>l</i> 35'54	<i>l</i> 33'06	<i>l</i> 32'08	<i>l</i> 33'00	<i>h</i> 34'08	<i>h</i> 32'78	<i>l</i> 32'50	<i>l</i> 32'44	<i>l</i> 33'20	<i>l</i> 32'92	
	34'89	32'81	32'91	33'81	34'15	34'22	32'70	32'71	33'51	33'23	
At XX											
<i>February 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XVIII & XVII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 35''·04 <i>w</i> = 14 ·01 $\frac{1}{w}$ = 0 ·07 <i>C</i> = 52° 31' 35''·04
	<i>l</i> 34'76	<i>l</i> 34'50	<i>l</i> 33'48	<i>l</i> 33'68	<i>h</i> 34'70	<i>l</i> 37'10	<i>l</i> 33'96	<i>l</i> 34'28	<i>l</i> 34'72	<i>l</i> 35'52	
	<i>l</i> 34'04	<i>l</i> 34'84	<i>l</i> 34'26	<i>l</i> 34'24	<i>l</i> 36'82	<i>l</i> 35'40	<i>l</i> 33'44	<i>l</i> 34'54	<i>l</i> 36'26	<i>l</i> 35'78	
	<i>l</i> 35'52	<i>l</i> 34'48	<i>l</i> 35'66	<i>l</i> 33'90	<i>l</i> 36'40	<i>l</i> 35'46	<i>l</i> 34'24	<i>l</i> 35'24	<i>l</i> 34'26	<i>l</i> 36'08	
			<i>l</i> 35'58	<i>l</i> 34'62	<i>l</i> 37'12	<i>l</i> 36'42					
	34'77	34'61	34'75	34'57	36'26	35'99	33'88	34'69	35'08	35'79	

At XX—(Continued.)											
<i>February 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XVII & XIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 54''·08 <i>w</i> = 15·23 $\frac{1}{w}$ = 0·07 <i>C</i> = 59° 32' 54''·08
	l 53'86	l 52'08	l 54'68	l 51'66	h 55'30	l 53'34	l 54'10	l 55'00	l 55'50	l 53'92	
	l 54'46	l 52'60	l 55'72	l 52'88	l 54'26	l 54'44	l 55'44	l 54'24	l 53'80	l 54'48	
	l 54'32	l 52'74	l 53'70	l 55'86	l 52'64	l 53'52	l 54'36	l 53'66	l 54'80	l 54'12	
			l 54'78	l 55'32	l 52'90						
			l 54'26								
	54'21	52'47	54'72	54'00	53'78	53'77	54'63	54'30	54'70	54'17	
XIX & XXI	l 25'92	l 27'54	l 24'94	l 27'60	h 24'12	h 26'40	l 26'04	l 26'98	h 25'52	h 26'70	<i>M</i> = 26''·31 <i>w</i> = 13·30 $\frac{1}{w}$ = 0·08 <i>C</i> = 62° 28' 26''·31
	l 26'14	l 25'82	l 26'32	l 27'64	h 25'56	h 26'48	l 25'80	l 27'50	h 26'42	h 27'08	
	l 24'66	l 26'48	l 25'30	l 26'24	h 25'18	h 26'40	l 26'18	l 27'70	h 26'08	h 27'92	
	25'57	26'61	25'52	27'16	24'95	26'43	26'01	27'39	26'21	27'23	
XXI & XXIII	l 23'84	l 20'62	l 21'16	l 22'26	h 21'78	h 21'04	l 21'08	l 19'68	h 22'80	h 20'84	<i>M</i> = 21''·28 <i>w</i> = 7·83 $\frac{1}{w}$ = 0·13 <i>C</i> = 55° 30' 21''·28
	l 23'02	l 21'50	l 19'88	l 22'34	h 20'62	h 19'60	l 19'84	l 19'84	h 21'74	h 22'66	
	l 23'12	l 20'84	l 20'86	l 20'54	h 19'16	h 21'60	l 21'18	l 20'14	h 23'14	h 20'42	
	23'33	20'99	20'63	21'71	20'52	20'75	20'70	19'89	22'56	21'74	
At XXI											
<i>February and March 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 14'	187° 14'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	208° 49'	
XIX & XXII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 54''·82 <i>w</i> = 9·30 $\frac{1}{w}$ = 0·11 <i>C</i> = 59° 59' 54''·82
	l 52'34	h 55'64	l 54'76	h 55'28	l 53'82	l 56'80	l 56'58	l 54'58	l 55'44	l 54'78	
	l 54'34	h 53'66	l 54'56	h 54'54	l 53'34	l 56'06	l 55'80	l 55'68	l 55'12	l 53'58	
	l 53'14	l 54'80	l 54'74	l 53'88	l 54'72	l 56'46	l 56'60	l 55'38	l 53'42	l 54'68	
	53'27	54'70	54'69	54'57	53'96	56'44	56'33	55'21	54'66	54'35	

At XXI—(Continued.)											
<i>February and March 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 14'	187° 14'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	208° 49'	
XXII & XXIV	"	"	"	"	"	"	"	"	"	"	
	l 4'10	h 2'58	l 3'40	h 3'80	l 4'96	l 3'00	l 2'28	l 3'10	l 3'88	l 4'08	M = 3''72
	l 3'72	h 4'34	l 2'50	h 3'70	l 4'50	l 2'64	l 2'40	l 2'66	l 3'44	l 5'72	w = 11'98
	l 5'78	l 3'50	l 3'32	l 2'68	l 3'80	l 6'18	l 2'06	l 3'54	l 4'32	l 4'74	$\frac{l}{w}$ = 0'08
					l 5'24						C = 93° 26' 3''72
	4'53	3'47	3'07	3'39	4'42	4'27	2'25	3'10	3'88	4'85	
XXIV & XXV	h 27'48	l 26'04	l 26'48	h 26'78	h 28'32	l 26'86	h 27'40	h 27'30	h 28'40	h 27'46	M = 27''07
	h 25'70	l 26'02	l 27'70	h 27'76	h 26'98	l 27'06	h 29'68	h 27'72	h 27'14	h 26'34	w = 16'70
	l 26'36	l 27'38	l 26'82	l 28'18	h 25'86	l 24'80	l 27'42	h 26'02	h 27'72	l 27'86	$\frac{l}{w}$ = 0'06
	l 25'44				l 27'04						C = 60° 49' 27''06
	26'25	26'48	27'00	27'57	27'05	26'24	28'17	27'01	27'75	27'22	
XXV & XXIII	h 56'28	l 56'62	l 59'98	l 58'68	h 56'42	l 57'24	h 55'88	h 58'58	h 56'92	h 59'30	M = 57''80
	h 55'94	l 56'86	l 60'08	l 58'22	h 57'52	l 55'94	h 55'82	h 58'34	h 57'16	h 59'78	w = 5'62
	l 58'42	l 55'92	l 59'22	l 61'18	h 56'92	l 57'22	l 58'12	h 58'92	h 56'92	l 57'62	$\frac{l}{w}$ = 0'18
	l 50'42										C = 50° 37' 57''80
	57'52	56'47	59'76	59'36	56'95	56'80	56'61	58'61	57'00	58'90	
XXIII & XX	l 41'24	h 39'34	l 40'76	l 39'10	l 40'72	l 39'82	l 39'56	h 39'06	h 38'88	h 39'24	M = 39''76
	l 42'26	h 39'74	l 40'60	l 38'04	l 39'48	h 38'30	l 39'46	h 38'22	h 40'30	h 39'64	w = 11'14
	l 40'32	l 39'48	l 40'18	l 37'66	h 40'60	l 39'40	l 40'52	h 38'84	h 40'70	l 39'92	$\frac{l}{w}$ = 0'09
	l 41'56										C = 48° 09' 39''76
	41'27	40'03	40'51	38'27	40'27	39'17	39'85	38'71	39'96	39'60	
XX & XIX	l 58'14	h 57'28	l 57'54	l 55'94	l 57'24	l 56'68	l 55'96	l 56'66	l 55'14	l 55'98	M = 56''52
	l 56'10	h 57'64	l 54'54	l 57'80	l 57'84	h 57'28	l 56'42	l 57'06	l 55'34	l 56'48	w = 18'13
	l 57'62	l 55'30	l 54'88	l 56'34	h 57'30	l 55'50	l 56'92	l 55'40	l 56'40	l 57'84	$\frac{l}{w}$ = 0'06
	l 54'06	l 57'76								l 56'06	C = 46° 56' 56''51
	l 56'28										
	57'29	56'11	56'18	56'69	57'46	56'49	56'43	56'37	55'63	56'59	

At XXII											
<i>February 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XXIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	206° 49'	
XXIV & XXI	"	"	"	"	"	"	"	"	"	"	M = 14".73 w = 30.30 $\frac{1}{w} = 0.03$ C = 42° 55' 14".73
	h14.68	h14.68	l14.36	l15.50	l14.88	l14.78	l14.92	l14.44	l15.08	l15.12	
	h14.94	h14.72	l15.78	l15.72	l15.08	l13.78	l15.16	l12.74	l13.50	l14.56	
	h13.46	h15.20	l15.04	l15.40	l14.06	l15.42	l15.38	l14.02	l14.92	l14.72	
	14.36	14.87	15.06	15.54	14.67	14.66	15.15	13.73	14.50	14.80	
XXI & XIX	h25.32	h23.24	l23.00	l22.46	l23.72	l24.26	l24.32	l24.04	l24.24	l24.32	M = 24".20 w = 18.20 $\frac{1}{w} = 0.05$ C = 70° 29' 24".20
	h24.42	h23.96	l23.78	l24.32	l24.36	l24.12	l24.80	l26.02	l24.38	l24.88	
	h26.02	h23.14	l23.24	l23.42	l23.42	l24.52	l23.82	l25.26	l24.28	l24.84	
	25.25	23.45	23.34	23.40	23.83	24.30	24.31	25.11	24.30	24.68	
At XXIII											
<i>February 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 38'	201° 38'	28° 50'	206° 50'	
XX & XXI	"	"	"	"	"	"	"	"	"	"	M = 58".77 w = 6.53 $\frac{1}{w} = 0.15$ C = 76° 19' 58".78
	h56.76	l58.22	l59.88	l59.06	l58.64	l59.76	l60.70	h57.50	l57.04	l61.26	
	h57.36	l57.44	l59.02	l58.62	l58.32	l60.70	l59.70	h58.80	l58.82	l57.82	
	l57.30	l56.56	l58.54	l56.18	l60.44	l58.98	l61.12	l58.34	l59.24	l59.84	
	57.14	57.41	59.15	57.95	59.13	59.81	60.51	58.21	58.37	59.97	
XXI & XXV	h39.34	l39.90	l38.46	l39.92	l39.92	l40.38	l39.88	h40.30	l42.48	l42.04	M = 40".61 w = 10.76 $\frac{1}{w} = 0.09$ C = { 68° 16' 40".62 * - 0".04
	h39.92	l41.34	l39.64	l40.96	l41.56	l40.60	l40.68	h40.02	l41.00	l43.36	
	h39.02	l41.76	l39.38	l42.40	l39.22	l41.66	l39.80	h42.74	l40.56	l40.20	
							l41.96		l40.50		
	39.43	41.00	39.16	41.09	40.23	40.88	40.12	41.26	41.35	41.53	

\* Correction for eccentricity of signal at XXV.



## A: XXIV

March and April 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on XXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XXVII & XXVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 48'' 29 <i>w</i> = 7 74 $\frac{1}{w}$ = 0 13 <i>C</i> = 56° 52' 48'' 29
	h46°72	l49°72	l46°86	h48°40	l49°60	l47°28	h46°80	l47°84	l51°44	h49°74	
	h46°46	l47°98	l46°72	h47°46	l46°82	l48°88	l48°72	l48°48	l50°32	h48°62	
	h48°60	l48°54	h47°70	l46°42	l47°86	l48°48	l48°30	l50°34	h49°34	h49°90	
	47°26	48°75	47°09	47°43	48°09	48°21	47°94	48°35	50°37	49°42	
XXVI & XXV	h49°78	l48°66	l49°28	h48°88	l47°72	l49°80	l49°66	l50°64	l46°98	h47°64	<i>M</i> = 48'' 64 <i>w</i> = 5 62 $\frac{1}{w}$ = 0 18 <i>C</i> = 53° 21' 48'' 65
	h49°04	l49°10	l50°16	h49°38	l47°34	h48°52	l48°56	l49°52	l46°58	h46°12	
	h48°62	l48°68	h48°82	l50°66	l46°12	h48°02	l49°00	l48°38	h47°54	h46°96	
	49°15	48°81	49°42	49°64	47°06	48°78	49°07	50°50	47°03	46°91	
XXV & XXI	h17°66	l17°14	l19°60	h20°02	l18°74	l18°30	l18°34	l17°30	h18°20	h18°42	<i>M</i> = 18'' 87 <i>w</i> = 9 08 $\frac{1}{w}$ = 0 11 <i>C</i> = 68° 29' 18'' 87
	h19°46	l17°38	l19°82	h18°48	l21°12	h19°32	l20°12	l18°96	h17°56	h18°24	
	h16°84	l16°98	h19°18	l21°64	l20°78	h19°70	l19°16	l18°68	h18°72	h19°24	
	18°21	17°17	19°53	20°05	20°27	19°11	19°21	18°31	18°16	18°63	
XXI & XXII	h42°24	l42°84	l43°04	h41°36	l42°56	l42°78	l42°48	l41°88	h43°98	h42°38	<i>M</i> = 42'' 56 <i>w</i> = 18 34 $\frac{1}{w}$ = 0 05 <i>C</i> = 43° 38' 42'' 56
	h41°68	l42°56	l43°26	h43°12	l41°52	h42°24	l42°00	l41°64	h43°46	h41°64	
	h43°88	l43°68	h43°94	h43°28	l43°30	h42°34	l43°96	l40°16	h42°28	h42°36	
	42°29	43°03	43°41	42°59	42°46	42°45	42°81	41°23	43°24	42°13	

At XXV											
<i>March 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 14'	14° 25'	194° 26'	21° 37'	201° 37'	28° 40'	208° 40'	
XXIII & XXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 22'' 28 <i>w</i> = 10 42 $\frac{1}{w}$ = 0 10 <i>C</i> = 61° 5' 22'' 27
	h 22° 08	l 21° 66	l 22° 50	h 22° 84	l 21° 58	h 23° 34	l 24° 32	l 23° 88	l 20° 62	l 21° 90	
	l 22° 00	l 22° 22	l 21° 90	h 23° 06	h 20° 12	h 22° 78	l 22° 10	l 23° 94	l 22° 44	l 19° 84	
	l 21° 64	l 21° 16	h 21° 62	h 24° 02	h 21° 96	h 20° 86	l 24° 72	l 22° 36	l 21° 00	l 21° 90	
					h 22° 10					l 23° 20	
	21° 91	21° 68	22° 01	23° 31	21° 44	22° 33	23° 71	23° 39	21° 35	21° 71	
XXI & XXIV	h 15° 88	l 13° 20	l 14° 82	l 15° 62	l 17° 50	h 12° 08	l 12° 88	l 14° 00	l 15° 60	l 16° 22	<i>M</i> = 14'' 73 <i>w</i> = 9 40 $\frac{1}{w}$ = 0 11 <i>C</i> = 50° 41' 14'' 74
	l 13° 96	l 12° 86	l 15° 00	l 15° 24	h 14° 18	h 14° 66	l 15° 46	l 14° 40	l 14° 02	l 17° 54	
	l 14° 54	l 15° 22	h 16° 88	l 13° 50	h 13° 22	h 14° 50	l 13° 02	l 14° 18	l 15° 74	l 15° 44	
			h 16° 50		h 13° 26	h 15° 72	l 13° 38			l 16° 22	
	14° 79	13° 76	15° 80	14° 79	14° 54	14° 24	13° 69	14° 19	15° 12	16° 36	
XXIV & XXVI	h 25° 10	l 24° 64	l 27° 14	l 26° 42	l 26° 84	l 25° 32	l 26° 90	l 27° 54	l 25° 86	l 23° 44	<i>M</i> = 26'' 72 <i>w</i> = 7 63 $\frac{1}{w}$ = 0 13 <i>C</i> = 61° 3' 26'' 73
	h 24° 64	l 26° 76	l 27° 28	l 26° 60	l 26° 30	l 29° 16	l 27° 04	l 29° 08	l 28° 86	l 26° 92	
	l 25° 76	l 23° 94	h 26° 28	h 28° 02	l 28° 54	l 26° 48	l 26° 98	l 26° 72	l 28° 34	l 26° 58	
			h 26° 76	h 27° 04				l 28° 82		l 26° 56	
				l 28° 36							
	25° 17	25° 11	26° 87	27° 29	27° 23	26° 99	26° 97	28° 04	27° 69	25° 88	
XXVI & XXVIII	h 22° 18	l 21° 88	l 21° 68	l 22° 24	h 22° 52	l 20° 96	l 23° 46	l 23° 38	l 23° 28	l 25° 40	<i>M</i> = 22'' 52 <i>w</i> = 14 55 $\frac{1}{w}$ = 0 07 <i>C</i> = 62° 0' 22'' 52
	h 22° 26	l 21° 52	l 21° 32	l 23° 82	h 22° 50	l 23° 26	l 22° 64	l 22° 42	l 21° 02	l 22° 56	
	l 23° 72	l 22° 78	h 21° 72	h 20° 30	l 23° 40	l 24° 68	l 23° 92	l 22° 82	l 21° 14	l 22° 50	
				h 20° 86	l 22° 64					l 22° 70	
	22° 72	22° 06	21° 57	21° 81	22° 77	22° 97	23° 34	22° 87	21° 81	23° 29	

At XXVI											
<i>March 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XXX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 14'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	208° 49'	
XXX & XXVIII	"	"	"	"	"	"	"	"	"	"	M = 19" 53 w = 23 04 $\frac{1}{w}$ = 0 04 C = 47° 27' 19" 54
	h19°12	h18°60	h20°34	l18°38	h20°98	l20°60	h19°50	l19°12	l17°04	h20°52	
	h20°98	h21°02	l19°32	l20°60	h19°02	l19°72	h19°62	l19°98	h19°94	h19°90	
	l19°06	h19°02	l18°50	l18°48	h20°64	l18°30	h19°38	l20°74	h18°60	l18°96	
		h19°16			h20°28			l20°00			
	19°72	19°45	19°39	19°15	20°23	19°54	19°50	19°96	18°53	19°79	
XXVIII & XXV	h24°82	h23°08	h23°16	l22°32	l25°54	l21°16	h23°56	l23°76	l22°66	h24°94	M = 23" 49 w = 5 26 $\frac{1}{w}$ = 0 19 C = 45° 12' 23" 49
	h23°14	h20°74	l25°04	l21°14	l25°92	l21°96	h24°28	l23°16	h22°94	h26°82	
	l21°50	h22°52	l23°74	l24°34	h23°44	l21°40	h23°92	l21°84	h24°60	l26°36	
		h23°90			h24°16			l23°10			
	23°15	22°56	23°98	22°60	24°77	21°51	23°92	22°97	23°40	26°04	
XXV & XXIV	h45°98	l43°42	h43°88	l46°12	l42°18	l46°82	h47°30	h44°76	l43°88	l42°24	M = 44" 87 w = 6 34 $\frac{1}{w}$ = 0 16 C = 65° 34' 44" 87
	h45°80	l44°48	l43°86	l46°16	l43°64	l44°76	h45°16	l44°78	l44°98	l43°02	
	h47°02	l43°82	l45°56	l45°82	h44°80	l46°48	h44°36	l46°14	l46°68	l43°38	
				h43°00		h44°62					
	46°27	43°91	44°43	46°03	43°41	46°02	45°36	45°23	45°18	42°88	
XXIV & XXVII	l46°74	l48°64	h48°10	l48°76	l47°82	l47°12	h47°48	h47°86	l45°54	l46°20	M = 47" 10 w = 11 60 $\frac{1}{w}$ = 0 09 C = 56° 34' 47" 10
	h47°36	l48°64	l47°64	l45°88	l47°38	l45°82	h47°88	h48°14	l47°08	l45°88	
	h45°66	l46°10	l47°00	l46°26	l49°06	l47°08	h48°48	l47°42	l44°72	l46°10	
	h46°08	l47°12									
	46°46	47°63	47°58	46°97	48°09	46°67	47°95	47°81	45°78	46°06	
XXVII & XXIX	h26°86	h30°20	h32°10	l26°26	h28°64	l30°36	h28°20	h26°24	l30°02	h29°92	M = 29" 37 w = 5 89 $\frac{1}{w}$ = 0 17 C = 79° 28' 29" 37
	h30°54	h31°44	l29°94	l31°90	h28°82	l32°20	h27°56	h28°36	l28°50	l28°16	
	h29°36	h29°44	l29°82	l29°56	h29°70	l31°44	h26°26	h28°66	l29°12	l28°74	
	l30°70		l28°54	h31°42	h29°88			l29°42			
	29°37	30°36	30°10	29°80	29°05	31°33	27°34	28°17	29°21	28°94	
XXIX & XXX	h15°84	h16°90	h13°96	l17°12	h15°26	l13°56	h15°42	l15°66	l16°32	h13°36	M = 14" 90 w = 14 45 $\frac{1}{w}$ = 0 07 C = 65° 42' 14" 90
	h14°64	h15°28	l16°00	l13°94	h15°34	l14°10	h13°12	l14°28	h13°04	h13°94	
	l16°88	h15°76	l14°02	l15°02	h14°74	l14°02	h15°52	l13°54	h14°80	l15°12	
			h14°70			h16°28	l14°40				
	15°79	15°98	14°66	15°15	15°11	13°89	15°09	14°47	14°72	14°14	

At XXVII											
<i>April 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XXIX & XXVI	"	"	"	"	"	"	"	"	"	"	M = 44".21 w = 12.94 $\frac{1}{w} = 0.08$ C = 45° 13' 44".21
	l 43'.12	l 43'.34	l 44'.18	l 45'.76	l 45'.88	l 47'.08	h 44'.30	h 43'.36	h 43'.32	h 43'.76	
	l 43'.76	l 45'.18	l 45'.52	l 44'.26	l 43'.54	l 45'.00	h 43'.86	h 44'.90	h 44'.20	h 43'.46	
	l 42'.58	l 42'.94	l 44'.30	l 44'.94	l 43'.48	l 45'.40	h 44'.00	h 42'.80	h 44'.02	h 43'.76	
			l 45'.04		l 44'.34						
	43'.15	43'.82	44'.76	44'.99	44'.31	45'.83	44'.05	43'.69	43'.85	43'.66	
XXVI & XXIV	l 26'.84	l 24'.38	l 23'.54	l 22'.14	h 25'.68	l 27'.88	l 26'.78	l 26'.38	l 25'.44	h 20'.96	M = 24".51 w = 3.33 $\frac{1}{w} = 0.30$ C = 66° 32' 24".50
	l 26'.10	l 22'.80	l 21'.76	l 23'.30	h 25'.34	l 26'.90	l 25'.52	l 23'.92	l 23'.62	h 22'.14	
	l 25'.50	l 22'.10	l 23'.66	l 24'.94	h 23'.54	l 26'.06	l 26'.42	l 25'.18	l 22'.78	h 22'.56	
			l 22'.64	l 23'.60					l 25'.70		
	26'.15	23'.09	22'.90	23'.50	24'.85	26'.95	26'.24	25'.16	24'.39	21'.89	
At XXVIII											
<i>March 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XXV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 50'	208° 50'	
XXV & XXVI	"	"	"	"	"	"	"	"	"	"	M = 14".10 w = 6.26 $\frac{1}{w} = 0.16$ C = { 72° 47' 14".10 * + 0".21
	h 14'.10	l 12'.08	l 11'.36	h 13'.58	l 15'.26	l 14'.66	l 13'.60	h 14'.64	h 14'.22	l 17'.88	
	h 13'.24	l 14'.42	h 13'.18	h 14'.58	l 13'.96	l 12'.60	l 14'.48	h 12'.40	h 15'.80	l 16'.24	
	l 14'.02	l 12'.32	h 12'.76	h 11'.90	l 16'.32	l 14'.76	l 14'.22	h 12'.80	h 15'.72	l 15'.72	
		l 13'.04						h 14'.68		l 15'.28	
	13'.79	12'.97	12'.43	13'.35	15'.18	14'.01	14'.10	13'.63	15'.25	16'.28	
XXVI & XXX	h 47'.66	l 51'.16	h 47'.00	h 48'.78	l 49'.78	l 48'.96	l 50'.52	h 48'.06	h 46'.10	l 46'.22	M = 48".56 w = 6.96 $\frac{1}{w} = 0.14$ C = 68° 12' 48".58
	h 47'.78	l 48'.00	h 47'.08	h 48'.12	l 48'.36	l 50'.54	l 48'.44	h 49'.18	h 46'.46	l 47'.68	
	l 48'.26	l 49'.00	h 46'.54	h 48'.24	l 49'.20	l 48'.54	l 51'.58	h 50'.56	h 48'.16	l 48'.86	
		l 48'.46				l 48'.92	h 50'.10			l 51'.38	
	47'.90	49'.16	46'.87	48'.38	49'.11	49'.35	49'.87	49'.48	46'.91	48'.54	

\* Correction for eccentricity of signal at XXV.

## At XXIX

\*November 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite  
No. 1.

†April 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch  
Theodolite.

Angle between	Circle readings, telescope being set on XXXII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 35'	28° 48'	208° 49'	
* XXXII & XXXI	"	"	"	"	"	"	"	"	"	"	M = 43''·60 w = 5·62 $\frac{1}{w}$ = 0·18 C = 61° 24' 43''·59
	l 41'84	l 39'52	h 44'56	h 42'84	l 42'46	l 44'58	l 44'62	h 44'16	h 44'46	l 45'36	
	l 42'08	l 42'18	h 44'40	h 42'00	l 44'10	l 43'96	l 43'32	h 45'06	h 44'56	l 45'32	
	l 44'12	l 41'34	h 42'94	l 44'60	l 44'12	l 45'02	l 43'04	h 45'76	l 43'44	l 43'94	
	l 40'48										
	42'13	41'01	43'97	43'15	43'56	44'52	43'66	44'99	44'15	44'87	
* XXXI & XXX	l 54'76	l 54'52	h 51'88	h 52'06	l 53'84	l 54'04	l 52'70	h 53'36	h 54'00	l 57'78	M = 54''·52 w = 5·60 $\frac{1}{w}$ = 0·18 C = 58° 46' 54''·52
	l 55'84	l 54'44	h 52'94	h 54'88	l 54'62	l 55'56	l 54'34	h 55'82	h 53'90	l 57'58	
	l 55'06	l 53'84	h 53'12	l 54'38	l 53'92	l 54'08	l 55'08	h 54'40	l 55'32	l 57'48	
	55'22	54'27	52'65	53'77	54'13	54'56	54'04	54'53	54'41	57'61	
† XXX & XXVI	Circle readings, telescope being set on XXX										M = 11''·33 w = 19·77 $\frac{1}{w}$ = 0·05 C = 61° 40' 11''·33
	0° 1'	180° 1'	7° 13'	187° 13'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	208° 49'	
	"	"	"	"	"	"	"	"	"	"	
	h 11'82	h 11'92	l 11'92	l 11'14	l 10'82	h 10'08	h 11'92	h 10'44	l 9'70	l 10'74	
	h 11'72	h 10'94	l 11'74	l 11'98	l 10'56	h 10'72	h 12'72	h 12'62	l 11'38	l 9'98	
h 11'48	h 10'56	l 10'24	l 11'48	l 12'74	h 11'20	h 13'54	l 11'26	l 11'54	l 11'58		
				l 10'48							
	11'67	11'14	11'30	11'53	11'15	10'67	12'73	11'44	10'87	10'77	
† XXVI & XXVII	h 48'14	h 46'92	l 48'16	l 50'70	l 51'48	h 48'42	h 46'84	l 46'60	l 46'94	l 48'32	M = 47''·71 w = 10·18 $\frac{1}{w}$ = 0·10 C = 55° 17' 47''·73
	h 47'54	h 48'66	l 47'48	l 48'26	l 48'48	h 47'20	l 47'26	l 47'60	l 47'52	l 48'24	
	h 48'76	h 48'76	l 48'02	l 48'26	l 46'76	h 47'06	l 44'66	l 46'88	l 45'96	l 46'86	
			l 46'80	l 49'12							
	48'15	48'11	47'89	48'51	48'96	47'56	46'25	47'03	46'81	47'81	

At XXX

\*March 1856, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.

†November 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XXVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 2'	180° 2'	7° 14'	187° 14'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'		
* XXVIII & XXVI	"	"	"	"	"	"	"	"	"	"	M = 52''·35 w = 8·93 $\frac{1}{w}$ = 0·11 C = 64° 19' 52''·35	
	h 53' 42	h 51' 34	h 52' 12	h 50' 74	l 53' 68	l 53' 60	l 53' 70	l 52' 84	l 53' 30	l 52' 26		
	h 53' 38	h 50' 54	h 52' 36	h 50' 80	l 52' 86	l 52' 46	l 54' 54	l 51' 94	l 51' 84	l 52' 14		
	h 52' 56	h 51' 92	h 52' 68	h 50' 36	l 53' 62	l 52' 94	l 53' 36	l 51' 18	l 50' 22	l 51' 72		
	53' 12	51' 27	52' 39	50' 63	53' 39	53' 00	53' 87	51' 99	51' 75	52' 04		
* XXVI & XXIX	h 32' 28	h 35' 42	h 33' 62	h 33' 50	l 33' 76	l 32' 04	l 33' 18	l 33' 86	l 33' 26	l 35' 04	M = 33''·57 w = 14·41 $\frac{1}{w}$ = 0·07 C = 52° 37' 33''·58	
	h 33' 90	h 34' 42	h 33' 30	h 34' 60	l 33' 42	l 32' 80	l 32' 02	l 32' 84	l 35' 04	l 33' 98		
	h 33' 98	h 32' 74	h 33' 24	h 36' 34	l 32' 74	l 32' 52	l 32' 62	l 33' 16	l 34' 78	l 33' 66		
			h 33' 48									
	33' 39	34' 19	33' 39	34' 48	33' 31	32' 45	32' 61	33' 29	34' 36	34' 23		
† XXIX & XXXI	Circle readings, telescope being set on XXIX										M = 36''·26 w = 6·92 $\frac{1}{w}$ = 0·14 C = 63° 57' 36''·26	
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 48'		
	"	"	"	"	"	"	"	"	"	"		
	h 35' 76	h 34' 56	h 37' 36	h 35' 10	l 36' 04	l 36' 84	l 38' 58	l 35' 52	h 39' 14	h 36' 42		
h 37' 50	h 33' 50	h 36' 12	l 35' 06	l 35' 20	l 35' 68	l 35' 74	l 35' 82	h 37' 50	h 37' 62			
h 36' 80	h 34' 50	h 35' 50	l 36' 12	l 36' 30	l 37' 30	l 37' 12	l 34' 66	h 38' 26	h 36' 32			
						l 36' 56		h 38' 70				
	36' 69	34' 19	36' 33	35' 43	35' 85	36' 61	37' 00	35' 33	38' 40	36' 79		
† XXXI & XXXIII	h 15' 50	h 13' 64	h 12' 52	h 14' 86	l 13' 08	l 13' 86	l 11' 12	l 14' 08	h 12' 98	h 13' 62	M = 13''·73 w = 10·28 $\frac{1}{w}$ = 0·10 C = 57° 3' 13''·72	
	h 13' 38	h 16' 10	h 13' 14	l 14' 36	l 14' 30	l 15' 52	l 13' 28	l 14' 70	h 12' 14	h 13' 58		
	h 14' 42	h 13' 04	h 12' 72	l 14' 02	l 13' 24	l 14' 88	l 11' 12	l 14' 74	h 13' 44	h 13' 86		
						l 13' 04		h 12' 48				
	14' 43	14' 26	12' 79	14' 41	13' 54	14' 75	12' 14	14' 51	12' 76	13' 69		

## At XXXI

November 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XXXIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 25'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
XXXIII & XXX	"	"	"	"	"	"	"	"	"	"	M = 39''·36 w = 18·95 $\frac{1}{w} = 0·05$ C = 57° 18' 39''·37
	h39°26	l39°20	h38°10	l38°78	h41°58	l40°46	h40°20	l40°16	l40°38	h38°60	
	h37°84	l39°28	l40°22	l38°46	h41°82	l38°58	h39°02	l39°86	l39°02	l39°12	
	l39°14	l39°18	l40°36	l38°22	l37°98	l39°00	l39°86	l39°08	h40°80	l38°34	
			l40°84		l38°32	l38°66			h39°96	l38°88	
	38°75	39°22	39°88	38°49	39°93	39°18	39°69	39°70	40°04	38°74	
XXX & XXIX	h29°80	l30°40	h27°96	l29°90	h27°62	l28°38	h28°70	l28°62	l29°32	l29°92	M = 29''·31 w = 12·76 $\frac{1}{w} = 0·08$ C = 57° 15' 29''·30
	h30°74	l30°02	l27°28	l29°00	h27°24	l30°56	h29°06	l28°78	h29°84	l29°46	
	l29°74	l30°34	l27°70	l28°98	l26°88	l29°64	l29°50	l29°60	h29°38	l30°72	
			l30°80		l28°54	l29°90					
	30°09	30°25	28°64	29°29	27°57	29°62	29°09	28°97	29°51	30°03	
XXIX & XXXII	h54°88	l52°96	l59°74	l57°00	h57°02	l59°36	h54°42	l56°30	l57°44	l56°04	M = 56''·40 w = 8·04 $\frac{1}{w} = 0·12$ C = 62° 30' 56''·40
	h55°08	l55°36	l57°94	l57°74	h56°98	l54°90	h55°24	l56°26	h57°24	l57°46	
	l56°06	l56°06	l54°46	l57°04	l57°72	l55°04	l56°54	l56°52	h57°54	l56°74	
		l55°78	l57°00		l57°40	l53°96					
	55°34	55°04	57°29	57°26	57°28	55°82	55°40	56°36	57°41	56°75	
XXXII & XXXV	h50°48	h47°32	l45°78	l46°72	h47°88	l46°54	h48°78	l49°36	l47°28	l49°48	M = 48''·51 w = 6·92 $\frac{1}{w} = 0·14$ C = 55° 9' 48''·50
	h49°96	h46°34	l48°36	l46°24	h47°24	l48°86	h48°94	l49°10	h47°76	l50°58	
	l49°68	h48°52	l47°58	l47°34	l50°14	l49°88	l49°12	l49°22	h48°80	l49°74	
		h49°48	l46°50		l48°70	l49°76					
	50°04	47°92	47°06	46°77	48°49	48°76	48°95	49°23	47°95	49°93	
XXXV & XXXIV	h40°46	h43°30	l44°36	l43°24	h44°70	l41°40	h44°96	l40°22	l43°68	l42°10	M = 42''·65 w = 5·12 $\frac{1}{w} = 0·20$ C = 49° 51' 42''·65
	h40°42	h44°66	l42°02	l44°62	h44°20	l41°98	h44°20	l41°82	h44°14	l40°14	
	l41°42	h43°00	l43°36	l43°24	l41°58	l42°94	l42°94	l40°96	h43°16	l39°98	
				l42°72	l43°38						
	40°77	43°65	43°25	43°70	43°30	42°43	44°03	41°00	43°66	40°74	

At XXXI—(Continued.)											
<i>November 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XXXIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 35'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
XXXIV & XXXIII	"	"	"	"	"	"	"	"	"	"	M = 23''94 w = 6.96 $\frac{1}{w}$ = 0.14 C = 77° 53' 23''93
	h23'72	l24'74	l24'16	l24'90	h22'00	l23'44	h22'98	l25'06	l23'06	l22'54	
	h25'38	l26'44	l24'72	l24'42	h22'14	l24'36	h23'26	l23'06	h21'00	l24'26	
	l25'04	l26'54	l24'00	l24'64	l24'08	l24'20	l23'02	l24'32	h21'64	l24'54	
				l24'16	l23'88				l21'10		
	24'71	25'91	24'29	24'65	23'10	23'97	23'09	24'15	21'70	23'78	
At XXXII											
<i>November and December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XXXVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
XXXVI & XXXV	"	"	"	"	"	"	"	"	"	"	M = 50''22 w = 12.82 $\frac{1}{w}$ = 0.08 C = 34° 55' 50''22
	h49'26	l49'04	h50'26	l49'50	l49'88	l50'10	l50'00	l50'50	l52'32	l50'46	
	l49'38	l48'46	h49'04	l48'70	l48'82	l51'60	l50'66	h52'00	l50'98	l49'74	
	l49'84	l51'58	h49'52	l50'50	l50'80	l51'84	l49'62	h51'02	l51'36	l49'50	
		l49'64						h51'58			
	49'49	49'68	49'61	49'57	49'83	51'18	50'09	51'28	51'55	49'90	
XXXIV & XXXI	h48'96	l48'26	h46'58	l46'94	l48'34	l47'04	l49'42	l48'46	l49'56	l48'22	M = 48''51 w = 10.30 $\frac{1}{w}$ = 0.10 C = 57° 27' 48''51
	l50'08	l50'28	h47'10	l47'44	l48'34	l47'42	l49'98	h48'38	l50'90	l49'22	
	l48'60	l47'78	h47'38	l47'24	l47'94	l48'64	l49'58	h48'50	l47'08	l49'80	
		l49'82			l48'82			h48'30	l49'52		
	49'21	49'04	47'02	47'21	48'21	47'98	49'66	48'41	49'27	49'08	
XXXI & XXX	h20'28	l22'48	h23'44	l21'98	l21'28	l20'48	l20'62	l21'26	l21'62	l20'76	M = 20''94 w = 17.06 $\frac{1}{w}$ = 0.06 C = 56° 4' 20''95
	l21'28	l19'82	h21'72	l22'00	l21'02	l20'78	l19'84	l20'98	l19'72	l20'68	
	l21'16	l20'22	h22'42	l21'02	l20'28	l19'42	l20'16	h21'12	l21'40	l21'44	
		l19'74	h22'06				h19'14				
	20'91	20'57	22'41	21'67	20'86	20'23	20'21	20'63	20'91	20'96	



At XXXIII												
November 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.												
Angle between	Circle readings, telescope being set on XXX										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 2'	186° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'		
XXX & XXXI	"	"	"	"	"	"	"	"	"	"		M = 7" 04 w = 6 38 $\frac{1}{w}$ = 0 16 C = 65° 38' 7" 04
	h 7'14	h 4'42	l 7'26	l 7'90	l 9'14	l 6'68	h 6'58	h 5'10	l 7'32	h 5'26		
	h 8'38	l 5'56	l 7'62	l 7'52	l 8'86	l 6'56	h 8'12	l 6'42	h 7'56	h 7'16		
	h 8'14	l 6'42	l 6'38	l 7'32	l 8'52	l 6'60	h 5'12	l 5'92	h 7'96	h 6'80		
	l 10'12						h 5'12	l 5'38				
	l 10'20											
	8'80	5'47	7'09	7'58	8'84	6'61	6'24	5'71	7'61	6'41		
XXXI & XXXIV	h 16'84	h 19'88	l 17'84	l 18'56	l 17'56	l 21'40	h 16'14	h 19'06	l 20'40	h 18'94	M = 18" 74 w = 4 58 $\frac{1}{w}$ = 0 22 C = 50° 19' 18" 72	
	h 15'44	l 19'94	l 17'84	l 19'58	l 18'16	l 21'14	h 14'98	l 19'54	h 16'60	h 18'52		
	h 16'66	l 18'90	l 19'64	l 19'86	l 19'56	l 21'72	h 18'66	l 19'74	h 17'92	h 18'76		
	l 17'50						h 17'26	l 20'66	h 17'70			
	l 17'38											
	16'76	19'57	18'44	19'33	18'43	21'42	16'76	19'75	18'16	18'74		
At XXXIV												
December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.												
Angle between	Circle readings, telescope being set on XXXIII										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 2'	186° 2'	7° 15'	187° 13'	14° 24'	194° 25'	21° 30'	201° 36'	28° 48'	206° 46'		
XXXIII & XXXI	"	"	"	"	"	"	"	"	"	"		M = 18" 56 w = 23 76 $\frac{1}{w}$ = 0 04 C = 51° 47' 18" 56
	h 18'36	l 17'56	h 17'72	l 19'44	l 19'46	l 19'48	l 18'58	l 19'46	l 18'94	l 18'78		
	l 20'12	l 18'26	h 17'36	l 16'76	l 18'62	l 19'84	l 19'94	l 19'52	l 18'52	l 18'42		
	l 17'06	l 17'76	l 17'58	l 18'72	l 18'66	l 18'46	l 17'54	h 18'00	l 18'32	l 18'88		
	l 18'62			l 19'00								
	18'54	17'86	17'55	18'48	18'91	19'26	18'69	18'99	18'59	18'69		
XXXI & XXXV	h 4'86	l 3'10	h 3'04	l 3'94	l 2'28	l 4'74	l 4'88	l 5'56	h 3'48	l 4'86	M = 3" 97 w = 15 50 $\frac{1}{w}$ = 0 06 C = 72° 18' 3" 97	
	l 3'90	l 3'78	h 2'26	l 3'02	l 2'10	l 4'92	l 4'52	l 5'98	h 3'40	l 4'04		
	l 4'50	l 3'68	l 3'60	l 3'46	l 5'72	l 4'36	l 4'78	h 3'26	l 3'44	l 3'38		
				l 3'68								
	4'42	3'52	2'97	3'47	3'45	4'67	4'73	4'93	3'44	4'09		

At XXXIV—(Continued.)											
<i>December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XXXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 48'	
XXXV & XXXVII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 27''·31 <i>w</i> = 15·50 $\frac{1}{w}$ = 0·06 <i>C</i> = 57° 17' 27''·31
	<i>h</i> 26°80	<i>l</i> 26°86	<i>h</i> 27°00	<i>l</i> 28°38	<i>l</i> 27°80	<i>l</i> 26°32	<i>l</i> 28°74	<i>l</i> 28°60	<i>h</i> 26°64	<i>l</i> 27°20	
	<i>l</i> 25°02	<i>l</i> 27°86	<i>h</i> 27°48	<i>l</i> 27°76	<i>l</i> 27°92	<i>l</i> 26°38	<i>l</i> 27°16	<i>l</i> 26°72	<i>h</i> 26°74	<i>l</i> 27°62	
	<i>l</i> 26°02	<i>l</i> 27°42	<i>l</i> 28°42	<i>l</i> 28°00	<i>l</i> 25°38	<i>l</i> 27°46	<i>l</i> 28°10	<i>h</i> 28°12	<i>l</i> 26°22	<i>l</i> 28°74	
	25°95	27°38	27°63	28°05	27°20	26°72	28°00	27°81	26°53	27°85	
At XXXV											
<i>December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XXXI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 38'	28° 48'	208° 48'	
XXXI & XXXII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 23''·01 <i>w</i> = 16·24 $\frac{1}{w}$ = 0·06 <i>C</i> = 67° 22' 23''·02
	<i>h</i> 22°50	<i>l</i> 21°16	<i>h</i> 23°98	<i>l</i> 22°30	<i>l</i> 22°56	<i>h</i> 22°72	<i>h</i> 22°26	<i>l</i> 22°98	<i>l</i> 25°44	<i>h</i> 22°48	
	<i>l</i> 24°38	<i>l</i> 21°98	<i>h</i> 22°40	<i>l</i> 23°60	<i>l</i> 23°60	<i>h</i> 21°88	<i>h</i> 23°72	<i>l</i> 23°54	<i>l</i> 22°96	<i>h</i> 22°42	
	<i>l</i> 23°54	<i>l</i> 23°30	<i>h</i> 22°82	<i>l</i> 23°24	<i>l</i> 24°48	<i>h</i> 21°16	<i>h</i> 22°94	<i>l</i> 23°88	<i>l</i> 22°86	<i>h</i> 22°54	
	23°47	22°15	23°07	23°05	23°55	21°92	22°97	23°47	24°01	22°48	
XXXII & XXXVI	<i>h</i> 22°32	<i>l</i> 22°54	<i>h</i> 22°92	<i>l</i> 23°44	<i>l</i> 23°82	<i>h</i> 24°98	<i>h</i> 24°70	<i>l</i> 22°74	<i>l</i> 23°18	<i>h</i> 23°42	<i>M</i> = 23''·32 <i>w</i> = 12·20 $\frac{1}{w}$ = 0·08 <i>C</i> = 91° 19' 23''·32
	<i>l</i> 22°54	<i>l</i> 22°52	<i>h</i> 22°82	<i>l</i> 22°84	<i>l</i> 22°18	<i>h</i> 25°00	<i>h</i> 24°28	<i>l</i> 22°88	<i>l</i> 22°56	<i>h</i> 24°76	
	<i>l</i> 23°80	<i>l</i> 21°88	<i>h</i> 22°26	<i>l</i> 23°10	<i>l</i> 22°02	<i>h</i> 24°62	<i>h</i> 24°56	<i>l</i> 22°80	<i>l</i> 24°00	<i>h</i> 24°12	
	22°89	22°31	22°67	23°13	22°67	24°87	24°51	22°81	23°25	24°10	
XXXVI & XXXVII	<i>h</i> 33°76	<i>l</i> 35°18	<i>h</i> 35°50	<i>l</i> 34°26	<i>l</i> 34°72	<i>h</i> 34°92	<i>h</i> 33°34	<i>l</i> 35°22	<i>l</i> 33°26	<i>h</i> 34°56	<i>M</i> = 34''·53 <i>w</i> = 20·40 $\frac{1}{w}$ = 0·05 <i>C</i> = 70° 3' 34''·53
	<i>l</i> 34°14	<i>l</i> 35°08	<i>h</i> 35°98	<i>l</i> 34°10	<i>l</i> 35°14	<i>h</i> 33°54	<i>h</i> 34°38	<i>l</i> 34°78	<i>l</i> 34°58	<i>h</i> 35°12	
	<i>l</i> 32°94	<i>l</i> 34°64	<i>h</i> 35°84	<i>l</i> 35°22	<i>l</i> 35°32	<i>h</i> 34°12	<i>h</i> 34°22	<i>l</i> 34°52	<i>l</i> 33°88	<i>h</i> 33°58	
	33°61	34°97	35°77	34°53	35°06	34°19	33°98	34°84	33°91	34°42	

At XXXV—(Continued.)												
<i>December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>												
Angle between	Circle readings, telescope being set on XXXI										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 0'	180° 0'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 38'	28° 48'	208° 48'		
XXXVII & XXXIV	"	"	"	"	"	"	"	"	"	"	"	M = 25''·26 w = 15·50 $\frac{1}{w}$ = 0·06 C = 73° 24' 25''·25
	l 24'94	l 23'14	h 25'28	l 25'10	l 25'98	h 23'16	h 26'30	l 26'50	l 25'86	h 24'44		
	l 26'60	l 24'40	h 24'84	l 25'26	l 25'48	h 26'14	h 24'58	l 25'74	l 25'38	h 23'42		
	l 26'76	l 24'78	h 25'38	l 23'98	l 25'72	h 24'62	h 25'94	l 24'66	l 26'06	h 26'84		
					h 23'62					h 26'62		
	26'10	24'11	25'17	24'78	25'73	24'39	25'61	25'63	25'77	25'33		
XXXIV & XXXI	l 14'18	l 18'14	h 12'48	l 14'54	l 13'08	h 14'74	h 13'52	l 12'80	l 12'82	h 12'78	M = 14''·00 w = 7·99 $\frac{1}{w}$ = 0·13 C = 57° 50' 14''·01	
	l 13'12	l 15'70	h 13'86	l 13'94	l 12'94	h 13'42	h 13'64	l 13'18	l 13'64	h 15'28		
	l 13'24	l 15'72	h 15'40	l 15'00	l 12'88	h 15'44	h 12'36	l 14'32	l 12'66	h 14'70		
		l 16'08	h 14'44							h 14'64		
	13'51	16'41	14'05	14'49	12'97	14'53	13'17	13'43	13'04	14'35		
At XXXVI												
<i>December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>												
Angle between	Circle readings, telescope being set on XXXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	7° 46'	187° 46'	14° 57'	194° 57'	22° 9'	202° 9'	29° 20'	208° 20'	36° 33'	216° 33'		
XXXIX & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 32''·46 w = 4·13 $\frac{1}{w}$ = 0·24 C = 48° 49' 32''·45	
	h 33'06	l 33'62	l 33'00	l 32'64	h 33'74	l 34'56	l 34'82	h 33'48	h 30'56	l 27'04		
	h 32'54	l 32'06	h 32'84	l 33'06	h 31'92	h 34'56	l 34'14	h 32'72	h 30'54	l 31'00		
	h 32'02	l 31'42	h 33'90	l 33'10	h 31'02	l 34'32	l 34'00	h 31'92	l 30'44	l 31'52		
		l 31'98			l 30'48					l 29'72		
	32'54	32'27	33'25	32'93	31'79	34'48	34'32	32'71	30'51	29'82		
XXXVIII & XXXVII	h 18'04	l 18'20	l 20'44	l 17'56	h 17'66	l 19'40	l 19'34	h 17'28	h 18'12	l 17'94	M = 18''·73 w = 12·38 $\frac{1}{w}$ = 0·08 C = 75° 50' 18''·73	
	h 17'62	l 20'56	h 17'44	l 18'88	h 17'92	h 20'40	l 20'02	h 17'56	h 19'38	l 18'42		
	h 18'24	l 20'00	h 17'90	l 18'96	h 17'54	l 20'58	l 19'38	h 18'16	l 19'46	l 18'66		
		l 18'86	h 19'04							l 19'68		
	17'97	19'41	18'71	18'47	17'71	20'13	19'58	17'67	18'99	18'68		

At XXXVIII—(Continued.)

December 1858, and January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's  
24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XXXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	206° 48'	
XXXIX & XLI	l 39° 52	l 37° 52	l 38° 60	h 36° 90	l 38° 74	h 35° 88	l 38° 72	l 38° 18	l 35° 38	l 40° 78	<i>M</i> = 37''·68 <i>w</i> = 4·14 $\frac{1}{w}$ = 0·24 <i>C</i> = 64° 16' 37''·68
	l 37° 70	l 38° 04	l 40° 40	h 35° 44	l 39° 10	h 35° 94	l 37° 86	h 37° 76	l 36° 12	l 41° 92	
	l 36° 92	l 38° 38	l 39° 58	l 36° 90	l 39° 16	l 37° 22	l 38° 46	h 35° 40	l 34° 56	h 37° 44	
							h 34° 86			h 36° 58	
	38° 05	37° 98	39° 53	36° 41	39° 00	36° 35	38° 35	36° 55	35° 35	39° 18	
XLI & XLII	l 37° 24	l 39° 14	l 37° 28	h 38° 64	l 39° 50	h 41° 10	l 39° 32	l 40° 94	l 38° 74	l 36° 70	<i>M</i> = 39''·00 <i>w</i> = 6·96 $\frac{1}{w}$ = 0·14 <i>C</i> = 59° 48' 38''·99
	l 38° 60	l 38° 00	l 38° 34	h 39° 76	l 37° 30	h 40° 40	l 40° 38	h 40° 22	l 38° 50	l 37° 58	
	l 37° 84	l 38° 32	l 37° 62	l 37° 94	l 37° 10	l 40° 12	l 40° 74	h 41° 42	l 39° 68	h 39° 76	
					l 38° 98					h 39° 40	
	37° 89	38° 49	37° 75	38° 78	38° 22	40° 54	40° 15	40° 86	38° 97	38° 36	
XLII & XL	l 42° 82	l 43° 88	l 41° 68	h 43° 46	l 40° 16	h 40° 90	l 40° 42	l 41° 76	l 40° 84	l 42° 28	<i>M</i> = 41''·68 <i>w</i> = 5·61 $\frac{1}{w}$ = 0·18 <i>C</i> = 61° 23' 41''·68
	l 42° 62	l 44° 04	l 40° 48	h 43° 46	l 43° 26	h 41° 62	l 39° 08	h 40° 46	l 42° 34	l 40° 88	
	l 42° 52	l 43° 20	l 41° 52	l 43° 46	l 41° 94	l 40° 90	l 39° 14	h 39° 56	l 41° 42	h 40° 66	
					l 41° 26						
	42° 65	43° 71	41° 23	43° 46	41° 66	41° 14	39° 55	40° 59	41° 53	41° 27	
XL & XXXVII	l 15° 74	l 16° 66	l 18° 12	h 15° 98	l 16° 56	h 14° 48	l 16° 08	l 16° 16	l 16° 88	l 15° 84	<i>M</i> = 16''·61 <i>w</i> = 18·88 $\frac{1}{w}$ = 0·05 <i>C</i> = 70° 21' 16''·61
	l 15° 42	l 17° 14	l 17° 82	h 16° 60	l 15° 32	h 16° 42	l 17° 66	h 18° 10	l 16° 04	l 16° 54	
	l 18° 24	l 17° 00	l 16° 46	l 16° 98	l 16° 92	l 15° 34	l 17° 28	h 16° 70	l 18° 28	h 15° 64	
	l 16° 98								h 16° 24		
	16° 60	16° 93	17° 47	16° 52	16° 27	15° 41	17° 01	16° 99	16° 86	16° 01	

## At XXXIX—(Continued.)

December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XLI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 49'	
XLI & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 38'' 73 w = 7 36 $\frac{1}{w} = 0 \cdot 14$ C = 67° 58' 38'' 73
	h39° 72	h38° 16	l38° 94	l37° 80	l36° 08	h41° 04	l39° 68	l39° 26	l38° 92	l36° 96	
	h37° 08	h38° 58	l38° 42	l38° 78	l38° 26	h41° 50	l38° 78	l39° 06	l37° 74	l37° 86	
	h38° 78	l37° 48	l37° 04	l39° 98	h39° 88	l41° 44	l39° 06	l38° 62	l37° 82	l37° 18	
	h38° 58			h40° 58							
	38° 54	38° 07	38° 13	38° 85	38° 70	41° 33	39° 17	38° 98	38° 16	37° 33	
XXXVIII & XXXVI	h16° 32	h15° 96	l18° 62	l17° 54	l15° 86	h17° 58	l14° 54	l16° 34	l17° 48	l18° 34	M = 16'' 88 w = 18 61 $\frac{1}{w} = 0 \cdot 05$ C = 75° 38' 16'' 87
	h16° 74	h16° 38	l17° 48	l16° 28	l17° 24	h16° 30	l16° 10	l16° 92	l18° 06	l17° 60	
	h15° 60	l17° 84	l17° 42	l16° 76	h17° 40	h16° 02	l16° 46	l17° 26	l16° 88	l17° 08	
						l15° 72					
	16° 22	16° 73	17° 84	16° 86	16° 83	16° 63	15° 71	16° 84	17° 47	17° 67	
At XL											
January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XXXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
XXXVII & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 30'' 22 w = 9 10 $\frac{1}{w} = 0 \cdot 11$ C = 73° 5' 30'' 22
	h29° 64	l27° 86	l31° 82	l31° 00	h29° 58	h29° 26	l31° 48	l31° 02	h31° 66	h28° 58	
	h30° 54	l28° 44	l30° 70	l30° 14	h30° 02	l30° 92	l30° 62	l29° 62	h30° 38	h29° 20	
	h29° 56	l27° 86	l31° 42	l31° 78	h29° 44	l31° 20	l30° 86	l31° 24	h30° 56	h30° 18	
	29° 91	28° 05	31° 31	30° 97	29° 68	30° 46	30° 99	30° 63	30° 87	29° 32	
XXXVIII & XLII	h26° 86	l27° 72	l26° 70	l28° 00	h26° 74	h26° 76	l27° 50	l25° 86	h26° 98	h28° 72	M = 27'' 06 w = 11 10 $\frac{1}{w} = 0 \cdot 09$ C = 72° 41' 27'' 06
	h25° 88	l26° 60	l26° 82	l28° 50	h26° 74	l25° 94	l28° 40	l26° 42	h28° 52	h28° 40	
	h27° 48	l27° 38	l25° 66	l27° 02	h27° 14	l25° 40	l27° 36	l24° 94	h26° 64	h28° 86	
	26° 74	27° 23	26° 39	27° 84	26° 87	26° 03	27° 75	25° 74	27° 38	28° 66	

At XL—(Continued.)											
<i>January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XXXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
XLII & XLIV	"	"	"	"	"	"	"	"	"	"	M = 25'' 39 w = 8 00 $\frac{1}{w}$ = 0 13 C = 62° 14' 25'' 39
	h26°10	l24°52	l24°06	l24°24	h24°38	h26°22	l26°86	l26°34	h26°22	h24°68	
	h26°84	l24°66	l23°62	l23°76	h24°72	l27°30	l25°80	l26°84	h26°08	h24°12	
	l26°50	l24°20	l25°00	l24°56	h25°26	l26°18	l25°54	l27°64	h25°10	h24°26	
	26°48	24°46	24°23	24°19	24°79	26°57	26°07	26°94	25°80	24°35	
At XLI											
<i>January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 35'	28° 48'	208° 49'	
XLIII & XLII	"	"	"	"	"	"	"	"	"	"	M = 20'' 55 w = 6 34 $\frac{1}{w}$ = 0 16 C = 59° 1' 20'' 55
	l19°68	h20°18	l20°68	h18°50	l17°12	l22°06	h19°20	l20°38	l21°06	h20°70	
	l21°34	l18°60	l22°10	h18°92	l20°50	l22°62	h21°20	l20°24	h20°22	l21°24	
	h19°68	l19°72	l21°08	l18°18	l20°28	l23°12	h22°52	l20°98	h20°48	l22°50	
					l20°16		l21°78				
	20°23	19°50	21°29	18°53	19°52	22°60	21°18	20°53	20°59	21°48	
XLII & XXXVIII	l14°38	h12°14	l12°28	h14°86	l12°46	l12°26	h10°64	l13°18	l12°00	h14°06	M = 12'' 31 w = 6 96 $\frac{1}{w}$ = 0 14 C = 60° 5' 12'' 31
	l11°96	h12°78	l11°72	h12°34	l12°94	l12°08	h 9°26	l12°68	h12°60	l14°86	
	h11°76	h13°16	l11°62	h11°06	l12°28	l12°02	h 9°42	l12°34	h11°14	l13°90	
	h13°38	h11°18		h12°32							
	12°87	12°32	11°87	12°65	12°56	12°12	9°77	12°73	11°91	14°27	
XXXVIII & XXXIX	l42°42	h46°16	l43°88	h41°58	l44°28	l42°46	h44°92	l42°86	l43°78	h42°24	M = 43'' 93 w = 7 19 $\frac{1}{w}$ = 0 14 C = 47° 44' 43'' 93
	l44°72	h45°92	l44°06	h42°54	l44°70	l43°26	h46°56	l44°66	h45°18	l41°12	
	h44°80	h42°96	l44°18	h43°94	l44°34	l42°86	h45°26	l44°26	h44°62	l43°02	
	h44°00	h45°44		h42°52							
	43°99	45°12	44°04	42°65	44°44	42°86	45°58	43°93	44°53	42°13	

At XLII											
January 1859, observed by Mr. H. Keelan with Licut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XL										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 24'	194° 25'	21° 35'	201° 35'	28° 49'	208° 49'	
XL & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 51''50 w = 19'72 $\frac{1}{w}$ = 0'05 C = 45° 54' 51''50
	l 51'52	l 50'32	h 50'70	l 52'32	l 51'00	h 51'72	l 51'54	h 50'92	l 51'18	l 53'68	
	l 51'16	l 51'90	l 51'72	h 50'62	l 52'02	h 50'58	l 52'70	h 51'90	h 49'88	l 52'92	
	l 50'72	l 50'76	l 51'38	h 50'50	l 50'96	h 51'78	l 52'64	h 52'50	h 51'30	l 51'86	
	h 51'48										
	51'13	50'99	51'27	51'23	51'33	51'36	52'29	51'77	50'79	52'82	
XXXVIII & XLI	l 11'92	l 9'16	h 10'92	h 8'52	l 7'84	h 10'50	l 8'00	h 8'84	l 9'40	l 10'82	M = 9''74 w = 6'16 $\frac{1}{w}$ = 0'16 C = 60° 6' 9''74
	l 13'00	l 8'40	l 10'72	h 10'04	l 9'50	h 10'34	l 7'82	h 9'34	h 6'98	l 11'98	
	h 9'12	l 8'92	l 11'78	h 8'74	l 8'78	h 9'66	l 9'28	h 9'30	h 9'32	l 11'66	
	h 11'20							h 10'68			
	11'31	8'83	11'14	9'10	8'71	10'17	8'37	9'16	9'10	11'49	
XLI & XLIII	l 12'96	l 15'30	h 15'16	h 14'90	l 18'08	h 15'16	l 15'04	h 16'56	l 15'22	l 16'10	M = 15''33 w = 9'98 $\frac{1}{w}$ = 0'10 C = 67° 52' 15''33
	l 11'04	l 15'08	l 14'58	h 15'70	l 16'52	h 15'66	l 15'68	h 15'70	h 17'74	l 15'70	
	h 14'94	l 15'52	l 13'22	h 16'30	l 15'58	h 16'00	l 15'50	h 15'32	h 15'04	l 14'60	
	h 14'64			l 16'04				h 15'02			
	13'40	15'30	14'32	15'63	16'56	15'61	15'41	15'86	15'76	15'47	
XLIII & XLV	l 20'68	l 22'00	h 20'26	h 19'58	l 19'70	h 19'14	l 19'40	h 21'16	l 19'34	l 18'76	M = 20''07 w = 11'82 $\frac{1}{w}$ = 0'08 C = 58° 1' 20''07
	l 20'98	l 21'10	l 20'80	h 19'72	l 21'06	h 19'96	l 19'58	h 21'08	h 19'60	l 18'00	
	h 20'16	l 19'92	l 21'36	h 18'66	l 20'82	h 18'86	l 18'46	h 20'48	h 20'76	l 19'70	
	h 21'84										
	20'92	21'01	20'81	19'32	20'53	19'32	19'15	20'91	19'90	18'82	
XLV & XLIV	l 58'46	l 59'56	h 56'82	h 56'92	l 56'54	h 57'06	l 56'04	h 56'66	l 59'50	l 55'46	M = 57''48 w = 7'13 $\frac{1}{w}$ = 0'14 C = 60° 25' 57''48
	l 60'74	l 59'12	l 56'46	h 57'42	l 55'24	h 57'44	l 57'14	h 56'92	h 58'12	l 55'98	
	h 58'52	l 59'34	l 57'78	h 57'80	l 57'20	h 57'68	l 57'34	h 57'92	h 59'14	l 56'50	
	h 55'96										
	58'42	59'34	57'02	57'38	56'33	57'39	56'84	57'17	58'92	55'98	
XLIV & XL	l 24'48	l 24'94	h 26'50	h 26'92	l 25'84	h 26'92	l 27'08	h 25'06	l 25'62	l 25'04	M = 25''70 w = 15'40 $\frac{1}{w}$ = 0'06 C = 67° 39' 25''70
	l 24'36	l 25'12	l 25'22	h 27'46	l 25'88	h 25'16	l 25'38	h 25'64	h 25'32	l 25'62	
	h 25'68	l 25'12	l 24'80	h 27'66	l 24'62	h 25'04	l 27'34	h 25'64	h 25'88	l 25'58	
	24'84	25'06	25'51	27'35	25'45	25'71	26'60	25'45	25'61	25'41	

At XLIII											
<i>March 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 49'	
XLVII & XLV	"	"	"	"	"	"	"	"	"	"	M = 25''·04 w = 10 ·10 $\frac{1}{w}$ = 0 ·10 C = 58° 47' 25''·05
	h 23° 08	l 24° 92	l 23° 48	h 23° 82	l 26° 86	h 24° 20	l 25° 68	h 27° 74	l 25° 68	l 26° 26	
	h 24° 22	l 23° 40	l 25° 18	h 23° 58	h 25° 76	l 25° 68	h 24° 26	h 26° 40	l 26° 34	l 25° 78	
	l 24° 70	l 23° 12	h 25° 84	l 24° 86	h 24° 58	l 25° 82	h 23° 92	h 25° 24	l 25° 60	l 25° 70	
	24° 00	23° 81	24° 83	24° 09	25° 80	25° 23	24° 62	26° 27	25° 87	25° 91	
XLV & XLII	h 56° 60	l 55° 58	l 54° 60	h 57° 36	h 55° 74	h 54° 94	l 55° 64	h 55° 82	l 54° 82	l 55° 12	M = 55''·30 w = 24 ·05 $\frac{1}{w}$ = 0 ·04 C = 60° 6' 55''·31
	h 55° 16	l 55° 80	l 55° 10	l 57° 34	h 54° 74	l 54° 00	h 56° 36	h 55° 52	l 54° 12	l 54° 46	
	l 55° 46	l 55° 94	h 56° 12	l 54° 66	h 55° 62	l 54° 10	h 54° 30	h 54° 34	l 55° 10	l 55° 72	
	55° 74	55° 77	55° 27	56° 02	55° 37	54° 35	55° 43	55° 23	54° 68	55° 10	
XLII & XLI	h 24° 66	l 24° 76	l 26° 86	h 23° 90	h 24° 34	h 24° 30	l 25° 46	h 25° 56	l 25° 42	l 23° 66	M = 24''·94 w = 27 ·80 $\frac{1}{w}$ = 0 ·04 C = 53° 6' 24''·94
	h 26° 14	l 25° 34	l 25° 28	l 24° 34	h 24° 00	l 24° 76	l 24° 88	h 25° 06	l 25° 44	l 23° 96	
	l 24° 96	l 25° 18	h 25° 32	l 25° 00	h 23° 90	l 25° 48	l 24° 34	h 25° 16	l 25° 12	l 25° 76	
	25° 25	25° 09	25° 82	24° 41	24° 08	24° 85	24° 89	25° 26	25° 33	24° 46	
At XLIV											
<i>January and February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XL										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 25'	194° 25'	21° 35'	201° 36'	28° 48'	208° 48'	
XL & XLII	"	"	"	"	"	"	"	"	"	"	M = 9''·96 w = 14 ·16 $\frac{1}{w}$ = 0 ·07 C = 50° 6' 9''·96
	h 9° 98	h 8° 26	h 9° 62	h 10° 14	l 10° 92	l 8° 76	h 9° 60	h 10° 12	h 10° 44	h 9° 84	
	h 9° 42	l 10° 76	h 9° 80	h 10° 84	l 9° 68	l 8° 34	h 10° 48	h 10° 58	h 10° 76	l 11° 44	
	h 10° 30	l 8° 80	l 9° 40	h 8° 82	l 10° 26	l 7° 72	h 9° 40	h 10° 92	h 11° 72	l 10° 90	
	9° 90	9° 53	9° 61	9° 93	10° 29	8° 27	9° 83	10° 54	10° 97	10° 73	



At XLIV—(Continued.)											
<i>January and February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XL										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 25'	194° 25'	21° 35'	201° 36'	28° 48'	206° 48'	
XLII & XLV	"	"	"	"	"	"	"	"	"	"	M = 20'' 28 w = 11 15 $\frac{1}{w} = 0 \cdot 09$ C = 59° 20' 20'' 28
	h 21' 24	h 18' 48	h 18' 50	h 21' 16	l 20' 62	l 21' 44	h 20' 22	h 19' 62	h 19' 72	h 22' 46	
	h 21' 50	l 20' 50	h 19' 98	h 20' 58	l 22' 64	l 20' 62	h 19' 98	h 19' 10	h 18' 72	l 20' 96	
	h 19' 14	l 21' 20	l 19' 38	h 19' 66	l 19' 68	l 21' 28	h 20' 80	h 19' 52	h 18' 70	l 21' 86	
	l 19' 96	l 20' 08			l 20' 46						
	20' 46	20' 07	19' 29	20' 47	20' 85	21' 11	20' 33	19' 41	19' 05	21' 76	
XLV & XLVI	h 4' 86	h 5' 58	l 6' 20	l 6' 28	h 6' 24	h 5' 88	l 6' 14	l 5' 20	l 3' 50	l 4' 24	M = 5'' 32 w = 26 04 $\frac{1}{w} = 0 \cdot 04$ C = 60° 50' 5'' 32
	h 4' 00	l 5' 10	l 4' 72	l 5' 56	h 5' 82	h 4' 42	l 5' 64	l 6' 02	l 3' 98	l 5' 08	
	h 6' 14	l 5' 22	l 6' 08	l 4' 22	h 5' 68	h 5' 12	l 5' 06	l 5' 84	l 4' 94	l 5' 00	
	h 6' 50				h 6' 04						
	5' 38	5' 30	5' 67	5' 35	5' 91	5' 37	5' 61	5' 69	4' 14	4' 77	
At XLV											
<i>February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	206° 49'	
XLVI & XLIV	"	"	"	"	"	"	"	"	"	"	M = 56'' 12 w = 40 00 $\frac{1}{w} = 0 \cdot 03$ C = 62° 59' 56'' 12
	l 56' 26	l 57' 28	l 56' 12	l 55' 68	h 56' 12	l 57' 14	h 55' 94	l 56' 04	l 56' 06	l 56' 24	
	h 57' 28	l 55' 76	l 55' 68	h 57' 42	l 56' 32	l 56' 00	l 55' 94	l 56' 32	l 55' 40	l 55' 94	
	h 57' 04	l 55' 80	l 55' 14	l 56' 20	l 56' 58	l 55' 48	l 55' 30	l 56' 64	l 55' 18	l 55' 28	
	56' 86	56' 28	55' 65	56' 43	56' 34	56' 21	55' 73	56' 33	55' 55	55' 82	
XLIV & XLII	l 42' 70	l 42' 18	l 43' 36	l 42' 82	l 44' 24	l 42' 48	h 43' 62	l 43' 02	l 43' 76	l 42' 38	M = 42'' 96 w = 18 61 $\frac{1}{w} = 0 \cdot 05$ C = 60° 13' 42'' 96
	h 42' 26	l 41' 96	l 41' 58	h 43' 00	l 42' 62	l 42' 24	l 42' 94	l 42' 98	l 45' 12	l 42' 76	
	h 42' 14	h 43' 04	l 42' 52	l 41' 62	l 43' 42	l 43' 08	l 42' 36	l 42' 72	l 44' 94	l 43' 80	
	h 43' 76										
	42' 72	42' 39	42' 49	42' 48	43' 43	42' 60	42' 97	42' 91	44' 61	42' 98	

## At XLV—(Continued.)

February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite  
No. 1.

Angle between	Circle readings, telescope being set on XLVI										$M$ = Mean of Groups $w$ = Relative Weight $C$ = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
XLII & XLIII	"	"	"	"	"	"	"	"	"	"	$M = 45''\cdot33$ $w = 4\cdot72$ $\frac{1}{w} = 0\cdot21$ $C = 61^{\circ}51'45''\cdot33$
	h43°20 l43°22 l43°20 h43°40	l41°94 l41°64 h45°12 h43°40	l44°04 l45°18 h45°96	h45°76 l46°28 l45°44	l45°38 l45°08 l44°78	l46°66 l45°98 l47°94	l45°56 l48°32 l47°52 l45°48	l46°72 l47°06 l45°58	l44°24 l45°56 l44°42	l45°34 l47°68 l46°04	
	43°21	43°03	45°06	45°83	45°08	46°86	46°72	46°45	44°74	46°35	
XLIII & XLVII	l42°12 l42°68 l42°20 h40°70	l42°68 l39°06 h41°82 h40°70	l41°68 l43°20 h40°00	h40°00 l40°46 l41°46	l41°00 l40°14 l41°42	l41°14 l40°36 l40°38	l40°98 l39°32 l40°66	l41°12 l41°54 l41°90	l40°58 l40°66 l42°30	l40°40 l40°26 l39°84	$M = 41''\cdot03$ $w = 15\cdot73$ $\frac{1}{w} = 0\cdot06$ $C = 65^{\circ}13'41''\cdot03$
		42°33	41°07	41°63	40°64	40°85	40°63	40°32	41°52	41°18	
XLVII & XLVIII	l45°56 l46°60 l46°36 l45°46	h45°82 h48°30 l46°02 l45°46	l45°98 l46°20 l47°14	h43°00 l44°62 l44°46	l44°86 l46°14 l46°64	l45°68 l46°20 l45°62	l46°64 l47°30 l47°12	l47°22 l45°10 l46°02	l46°54 l47°12 l46°22	l46°88 l47°52 l46°66	$M = 46''\cdot15$ $w = 11\cdot45$ $\frac{1}{w} = 0\cdot09$ $C = 49^{\circ}32'46''\cdot15$
		46°17	46°40	46°44	44°03	45°88	45°83	47°02	46°11	46°63	
XLVIII & XLVI	l9°94 l9°24 l9°02 l10°92	h10°80 h8°60 l11°98 l10°92	l10°92 l8°94 l9°76	h11°02 l11°38 l10°16	l9°88 l8°72 l8°74	l8°68 l8°18 l7°96	l7°80 l7°42 l8°10	l7°00 l6°96 l6°02	l7°88 l6°58 l6°86	l8°78 l6°92 l7°92	$M = 8''\cdot75$ $w = 4\cdot51$ $\frac{1}{w} = 0\cdot22$ $C = 60^{\circ}8'8''\cdot75$
		9°40	10°58	9°87	10°85	9°11	8°27	7°77	6°66	7°11	

At XLVI											
<i>February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	206° 49'	
XLIV & XLV	"	"	"	"	"	"	"	"	"	"	M = 59'' 00 w = 11 14 $\frac{1}{w}$ = 0 09 C = 56° 9' 59'' 00
	l 58' 26	l 58' 66	l 58' 16	l 59' 38	l 57' 98	h 61' 58	l 59' 56	l 57' 10	h 57' 92	h 59' 16	
	l 59' 38	l 58' 36	h 58' 36	l 60' 48	l 59' 96	h 60' 18	l 60' 12	l 59' 80	h 57' 40	l 57' 96	
	l 59' 24	l 57' 56	h 57' 62	l 59' 86	l 58' 64	l 60' 64	l 58' 60	l 59' 62	h 59' 00	l 58' 96	
	58' 96	58' 19	58' 05	59' 91	58' 86	60' 80	59' 43	59' 04	58' 11	58' 69	
XLV & XLVIII	l 49' 70	l 50' 00	l 49' 08	l 47' 36	l 48' 28	h 48' 66	l 48' 98	l 49' 40	h 47' 58	h 49' 68	M = 48'' 98 w = 17 20 $\frac{1}{w}$ = 0 06 C = 61° 3' 48'' 98
	l 48' 38	l 49' 96	h 47' 58	l 49' 44	l 48' 14	h 49' 80	l 48' 54	l 50' 00	h 48' 12	h 48' 94	
	l 47' 62	l 48' 46	h 48' 70	l 48' 02	l 50' 00	l 50' 30	l 49' 16	l 50' 56	h 48' 62	l 50' 32	
	48' 57	49' 47	48' 45	48' 27	48' 81	49' 59	48' 89	49' 99	48' 11	49' 65	
At XLVII											
<i>March 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on L										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	206° 49'	
L & XLIX	"	"	"	"	"	"	"	"	"	"	M = 35'' 37 w = 19 72 $\frac{1}{w}$ = 0 05 C = 46° 29' 35'' 38
	l 34' 36	h 34' 12	l 34' 20	l 35' 48	l 34' 88	h 35' 20	l 35' 36	l 36' 30	l 34' 48	l 35' 44	
	l 34' 10	h 35' 20	l 35' 64	l 34' 56	l 35' 14	l 35' 42	l 36' 34	l 35' 84	l 35' 70	l 36' 12	
	l 35' 40	l 35' 38	l 33' 94	l 35' 06	l 36' 54	l 36' 60	l 34' 56	l 36' 12	l 35' 84	l 36' 86	
	34' 62	34' 90	34' 59	35' 03	35' 52	35' 74	35' 42	36' 43	35' 34	36' 14	
XLIX & XLVIII	l 48' 40	h 47' 76	l 46' 70	l 44' 94	l 47' 20	l 47' 06	l 46' 16	l 47' 68	l 45' 50	l 46' 74	M = 46'' 58 w = 21 55 $\frac{1}{w}$ = 0 05 C = 54° 45' 46'' 58
	l 46' 96	h 45' 90	l 46' 18	l 46' 56	l 46' 96	l 45' 14	l 47' 88	l 46' 32	l 46' 54	l 47' 04	
	l 46' 62	l 46' 44	l 48' 52	l 46' 18	l 45' 76	l 46' 34	l 47' 98	l 45' 54	l 45' 32	l 45' 04	
			l 46' 62	l 46' 48			l 46' 34				
	47' 33	46' 70	47' 01	46' 04	46' 64	46' 18	47' 34	46' 47	45' 79	46' 27	

At XXXVI—(Continued.)											
December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XXXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	7° 46'	187° 46'	14° 57'	194° 57'	22° 5'	202° 9'	25° 26'	205° 20'	36° 33'	210° 33'	
XXXVII & XXXV	"	"	"	"	"	"	"	"	"	"	M = 36''85 w = 14.77 $\frac{1}{w}$ = 0.07 C = 65° 9' 36''86
	h36.20	l35.46	l36.38	l38.58	h36.30	l36.74	l35.18	h36.82	h37.94	l37.44	
	h37.82	l35.68	h36.82	l36.60	h36.88	h35.82	l36.14	h36.98	h36.72	l38.92	
	h38.78	l35.26	h36.88	l37.08	h38.68	h36.04	l36.90	h36.84	h37.90	l36.46	
	h37.40				l36.50					l37.44	
	37.55	35.47	36.69	37.42	37.09	36.20	36.07	36.88	37.52	37.57	
XXXV & XXXII	h47.34	l47.54	l46.48	l47.72	h47.14	l47.24	l47.68	h47.66	h44.56	l48.90	M = 47''26 w = 10.90 $\frac{1}{w}$ = 0.09 C = 53° 44' 47''26
	h47.52	l46.12	l46.54	l48.06	h47.58	h48.50	l48.00	h46.98	h46.16	l48.02	
	h45.94	l47.38	l46.78	l47.32	h47.68	h48.16	l47.24	h47.44	h44.98	l49.08	
	46.93	47.01	46.60	47.70	47.47	47.97	47.64	47.36	45.23	48.67	
At XXXVII											
December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XXXIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	186° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	25° 49'	208° 15'	
XXXIV & XXXV	"	"	"	"	"	"	"	"	"	"	M = 7''38 w = 15.27 $\frac{1}{w}$ = 0.07 C = 49° 18' 7''38
	h7.46	l8.02	l7.74	l7.42	l8.42	l6.50	l7.62	l7.46	l6.68	h5.42	
	h7.64	l6.82	l7.76	l8.36	l9.34	l6.14	l6.48	l7.98	l8.78	h6.12	
	h7.92	l7.00	l7.86	l7.62	l8.32	l7.00	h5.18	l7.50	l7.42	h7.38	
						l6.52					
	7.67	7.28	7.79	7.80	8.69	6.55	6.45	7.65	7.63	6.31	
XXXV & XXXVI	h48.58	l47.64	l48.60	l48.16	l49.08	l50.18	l50.38	l49.40	l47.14	h50.62	M = 49''20 w = 6.32 $\frac{1}{w}$ = 0.16 C = 44° 46' 49''21
	h47.44	l47.62	l49.76	l48.40	l49.02	l50.14	l50.32	l48.94	l48.90	h53.10	
	h48.64	l47.12	l49.00	l48.84	l49.02	l50.26	h50.34	l49.48	l48.68	h51.54	
							l50.42			h51.14	
	48.22	47.46	49.12	48.47	49.04	50.19	50.37	49.27	48.24	51.60	

At XXXVII—(Continued.)											
December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XXXIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 49'	
XXXVI & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 8'' 94 w = 8'' 22 $\frac{1}{w}$ = 0'' 12 C = 55° 32' 8'' 94
	h 7'60	l 8'08	l 8'16	l 9'22	l 8'68	l 10'12	l 8'30	l 8'96	l 11'72	h 8'66	
	h 8'00	l 7'94	l 8'10	l 9'36	l 7'50	l 10'02	l 9'68	l 9'76	l 10'42	h 8'54	
	h 7'14	l 8'68	l 8'96	l 8'58	l 9'26	l 8'70	h 9'38	l 9'40	l 11'66	h 7'36	
							l 10'32			h 7'32	
	7'58	8'23	8'41	9'05	8'48	9'61	9'42	9'37	11'27	7'97	
XXXVIII & XL	h 15'44	l 14'28	l 16'64	l 13'56	l 15'40	l 15'28	l 14'40	l 12'54	l 13'88	h 16'48	M = 14'' 53 w = 7' 39 $\frac{1}{w}$ = 0' 14 C = 36° 33' 14'' 52
	h 16'78	l 14'72	l 15'28	l 13'26	l 14'60	l 16'14	l 15'48	l 13'50	l 13'56	h 13'30	
	l 14'88	l 15'22	l 15'76	l 13'90	l 15'24	l 15'72	h 12'12	l 13'76	l 13'70	h 14'96	
							l 11'86			h 13'30	
							l 11'72				
	15'70	14'74	15'89	13'57	15'08	15'71	13'12	13'27	13'71	14'51	
At XXXVIII											
December 1858, and January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XXXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 48'	
XXXVII & XXXVI	"	"	"	"	"	"	"	"	"	"	M = 32'' 99 w = 11' 82 $\frac{1}{w}$ = 0' 08 C = 48° 37' 33'' 00
	l 33'14	l 31'60	l 31'10	h 33'12	l 33'32	h 32'68	l 32'60	l 32'76	l 35'50	l 33'42	
	l 34'82	l 30'76	l 32'48	h 33'40	l 33'84	h 33'26	l 33'96	h 31'62	l 33'62	l 32'68	
	l 31'56	l 31'84	l 32'06	l 32'30	l 34'60	l 33'28	l 33'72	h 33'78	l 33'32	h 31'32	
	l 33'58							h 34'50	h 33'24	h 34'28	
	33'28	31'40	31'88	32'94	33'92	33'07	33'43	33'17	33'92	32'93	
XXXVI & XXXIX	l 10'12	l 11'74	l 10'26	h 10'80	l 10'86	h 11'28	l 11'10	l 10'36	l 13'66	l 11'36	M = 11'' 51 w = 18' 29 $\frac{1}{w}$ = 0' 05 C = 55° 32' 11'' 52
	l 10'30	l 11'66	l 11'96	h 10'74	l 10'44	h 12'16	l 11'52	h 10'96	l 12'84	l 10'46	
	l 11'74	l 11'46	l 12'04	l 11'96	l 11'46	l 12'26	l 10'10	h 13'14	l 13'06	h 12'98	
							h 12'66	h 11'46	h 12'62		
	10'72	11'62	11'42	11'17	10'92	11'90	10'91	11'78	12'76	11'86	

At XXXVIII—(Continued.)											
December 1858, and January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XXXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 18'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 48'	
XXXIX & XLI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 37''68 <i>w</i> = 4.14 $\frac{1}{w}$ = 0.24 <i>C</i> = 64° 16' 37''68
	l 39°52	l 37°52	l 38°60	h 36°90	l 38°74	h 35°88	l 38°72	l 38°18	l 35°38	l 40°78	
	l 37°70	l 38°04	l 40°40	h 35°44	l 39°10	h 35°94	l 37°86	h 37°76	l 36°12	l 41°92	
	l 36°92	l 38°38	l 39°58	l 36°90	l 39°16	l 37°22	l 38°46	h 35°40	l 34°56	h 37°44	
								h 34°86		h 36°58	
	38°05	37°98	39°53	36°41	39°00	36°35	38°35	36°55	35°35	39°18	
XLI & XLII	l 37°24	l 39°14	l 37°28	h 38°64	l 39°50	h 41°10	l 39°32	l 40°94	l 38°74	l 36°70	<i>M</i> = 39''00 <i>w</i> = 6.96 $\frac{1}{w}$ = 0.14 <i>C</i> = 59° 48' 38''99
	l 38°60	l 38°00	l 38°34	h 39°76	l 37°30	h 40°40	l 40°38	h 40°22	l 38°50	l 37°58	
	l 37°84	l 38°32	l 37°62	l 37°94	l 37°10	l 40°12	l 40°74	h 41°42	l 39°68	h 39°76	
					l 38°98					h 39°40	
	37°89	38°49	37°75	38°78	38°22	40°54	40°15	40°86	38°97	38°36	
XLII & XL	l 42°82	l 43°88	l 41°68	h 43°46	l 40°16	h 40°90	l 40°42	l 41°76	l 40°84	l 42°28	<i>M</i> = 41''68 <i>w</i> = 5.61 $\frac{1}{w}$ = 0.18 <i>C</i> = 61° 23' 41''68
	l 42°62	l 44°04	l 40°48	h 43°46	l 43°26	h 41°62	l 39°08	h 40°46	l 42°34	l 40°88	
	l 42°52	l 43°20	l 41°52	l 43°46	l 41°94	l 40°90	l 39°14	h 39°56	l 41°42	h 40°66	
					l 41°26						
	42°65	43°71	41°23	43°46	41°66	41°14	39°55	40°59	41°53	41°27	
XL & XXXVII	l 15°74	l 16°66	l 18°12	h 15°98	l 16°56	h 14°48	l 16°08	l 16°16	l 16°88	l 15°84	<i>M</i> = 16''61 <i>w</i> = 18.88 $\frac{1}{w}$ = 0.05 <i>C</i> = 70° 21' 16''61
	l 15°42	l 17°14	l 17°82	h 16°60	l 15°32	h 16°42	l 17°66	h 18°10	l 16°04	l 16°54	
	l 18°24	l 17°00	l 16°46	l 16°98	l 16°92	l 15°34	l 17°28	h 16°70	l 18°28	h 15°64	
	l 16°98								h 16°24		
	16°60	16°93	17°47	16°52	16°27	15°41	17°01	16°99	16°86	16°01	

## At XXXIX—(Continued.)

December 1858, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XLI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 49'	
XLI & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 38'' 73 w = 7 36 $\frac{1}{w}$ = 0 14 C = 67° 58' 38'' 73
	h39° 72	h38° 16	l38° 94	l37° 80	l36° 08	h41° 04	l39° 68	l39° 26	l38° 92	l36° 06	
	h37° 08	h38° 58	l38° 42	l38° 78	l38° 26	h41° 50	l38° 78	l39° 06	l37° 74	l37° 86	
	h38° 78	l37° 48	l37° 04	l39° 98	h39° 88	l41° 44	l39° 06	l38° 62	l37° 82	l37° 18	
	h38° 58			h40° 58							
	38° 54	38° 07	38° 13	38° 85	38° 70	41° 33	39° 17	38° 98	38° 16	37° 33	
XXXVIII & XXXVI	h16° 32	h15° 96	l18° 62	l17° 54	l15° 86	h17° 58	l14° 54	l16° 34	l17° 48	l18° 34	M = 16'' 88 w = 18 61 $\frac{1}{w}$ = 0 05 C = 75° 38' 16'' 87
	h16° 74	h16° 38	l17° 48	l16° 28	l17° 24	h16° 30	l16° 10	l16° 92	l18° 06	l17° 60	
	h15° 60	l17° 84	l17° 42	l16° 76	h17° 40	h16° 02	l16° 46	l17° 26	l16° 88	l17° 08	
							l15° 72				
	16° 22	16° 73	17° 84	16° 86	16° 83	16° 63	15° 71	16° 84	17° 47	17° 67	

## At XL

January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on XXXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
XXXVII & XXXVIII	"	"	"	"	"	"	"	"	"	"	M = 30'' 22 w = 9 10 $\frac{1}{w}$ = 0 11 C = 73° 5' 30'' 22
	h29° 64	l27° 86	l31° 82	l31° 00	h29° 58	h29° 26	l31° 48	l31° 02	h31° 66	h28° 58	
	h30° 54	l28° 44	l30° 70	l30° 14	h30° 02	l30° 92	l30° 62	l29° 62	h30° 38	h29° 20	
	h29° 56	l27° 86	l31° 42	l31° 78	h29° 44	l31° 20	l30° 86	l31° 24	h30° 56	h30° 18	
	29° 91	28° 05	31° 31	30° 97	29° 68	30° 46	30° 99	30° 63	30° 87	29° 32	
XXXVIII & XLII	h26° 86	l27° 72	l26° 70	l28° 00	h26° 74	h26° 76	l27° 50	l25° 86	h26° 98	h28° 72	M = 27'' 06 w = 11 10 $\frac{1}{w}$ = 0 09 C = 72° 41' 27'' 06
	h25° 88	l26° 60	l26° 82	l28° 50	h26° 74	l25° 94	l28° 40	l26° 42	h28° 52	h28° 40	
	h27° 48	l27° 38	l25° 66	l27° 02	h27° 14	l25° 40	l27° 36	l24° 94	h26° 64	h28° 86	
		26° 74	27° 23	26° 39	27° 84	26° 87	26° 03	27° 75	25° 74	27° 38	

At XL—(Continued.)											
<i>January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XXXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
XLII & XLIV	"	"	"	"	"	"	"	"	"	"	M = 25'' 39 w = 8 00 $\frac{1}{w}$ = 0 13 C = 62° 14' 25'' 39
	h26°10	l24°52	l24°06	l24°24	h24°38	h26°22	l26°86	l26°34	h26°22	h24°68	
	h26°84	l24°66	l23°62	l23°76	h24°72	l27°30	l25°80	l26°84	h26°08	h24°12	
	l26°50	l24°20	l25°00	l24°56	h25°26	l26°18	l25°54	l27°64	h25°10	h24°26	
	26°48	24°46	24°23	24°19	24°79	26°57	26°07	26°94	25°80	24°35	
At XLI											
<i>January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 18'	14° 24'	194° 25'	21° 35'	201° 35'	28° 48'	208° 49'	
XLIII & XLII	"	"	"	"	"	"	"	"	"	"	M = 20'' 55 w = 6 34 $\frac{1}{w}$ = 0 16 C = 59° 1' 20'' 55
	l19°68	h20°18	l20°68	h18°50	l17°12	l22°06	h19°20	l20°38	l21°06	h20°70	
	l21°34	l18°60	l22°10	h18°92	l20°50	l22°62	h21°20	l20°24	h20°22	l21°24	
	h19°68	l19°72	l21°08	l18°18	l20°28	l23°12	h22°52	l20°98	h20°48	l22°50	
					l20°16		l21°78				
	20°23	19°50	21°29	18°53	19°52	22°60	21°18	20°53	20°59	21°48	
XLII & XXXVIII	l14°38	h12°14	l12°28	h14°86	l12°46	l12°26	h10°64	l13°18	l12°00	h14°06	M = 12'' 31 w = 6 96 $\frac{1}{w}$ = 0 14 C = 60° 5' 12'' 31
	l11°96	h12°78	l11°72	h12°34	l12°94	l12°08	h 9°26	l12°68	h12°60	l14°86	
	h11°76	h13°16	l11°62	h11°06	l12°28	l12°02	h 9°42	l12°34	h11°14	l13°90	
	h13°38	h11°18		h12°32							
	12°87	12°32	11°87	12°65	12°56	12°12	9°77	12°73	11°91	14°27	
XXXVIII & XXXIX	l42°42	h46°16	l43°88	h41°58	l44°28	l42°46	h44°92	l42°86	l43°78	h42°24	M = 43'' 93 w = 7 19 $\frac{1}{w}$ = 0 14 C = 47° 44' 43'' 93
	l44°72	h45°92	l44°06	h42°54	l44°70	l43°26	h46°56	l44°66	h45°18	l41°12	
	h44°80	h42°96	l44°18	h43°94	l44°34	l42°86	h45°26	l44°26	h44°62	l43°02	
	h44°00	h45°44		h42°52							
	43°99	45°12	44°04	42°65	44°44	42°86	45°58	43°93	44°53	42°13	



At XLII											
January 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on XL										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 18'	187° 18'	14° 24'	194° 25'	21° 35'	201° 35'	28° 49'	208° 49'	
XL & XXXVIII	"	"	"	"	"	"	"	"	"	"	
	l 51'52	l 50'32	h 50'70	l 52'32	l 51'00	h 51'72	l 51'54	h 50'92	l 51'18	l 53'68	M = 51''50
	l 51'16	l 51'90	l 51'72	h 50'62	l 52'02	h 50'58	l 52'70	h 51'90	h 49'88	l 52'92	w = 19.72
	l 50'72	l 50'76	l 51'38	h 50'50	l 50'96	h 51'78	l 52'64	h 52'50	h 51'30	l 51'86	$\frac{1}{w} = 0.05$
			h 51'48								C = 45° 54' 51''50
	51'13	50'99	51'27	51'23	51'33	51'36	52'29	51'77	50'79	52'82	
XXXVIII & XLI	l 11'92	l 9'16	h 10'92	h 8'52	l 7'84	h 10'50	l 8'00	h 8'84	l 9'40	l 10'82	M = 9''74
	l 13'00	l 8'40	l 10'72	h 10'04	l 9'50	h 10'34	l 7'82	h 9'34	h 6'98	l 11'98	w = 6.16
	h 9'12	l 8'92	l 11'78	h 8'74	l 8'78	h 9'66	l 9'28	h 9'30	h 9'32	l 11'66	$\frac{1}{w} = 0.16$
	h 11'20							h 10'68			C = 60° 6' 9''74
	11'31	8'83	11'14	9'10	8'71	10'17	8'37	9'16	9'10	11'49	
XLI & XLIII	l 12'96	l 15'30	h 15'16	h 14'90	l 18'08	h 15'16	l 15'04	h 16'56	l 15'22	l 16'10	M = 15''33
	l 11'04	l 15'08	l 14'58	h 15'70	l 16'52	h 15'66	l 15'68	h 15'70	h 17'74	l 15'70	w = 9.98
	h 14'94	l 15'52	l 13'22	h 16'30	l 15'58	h 16'00	l 15'50	h 15'32	h 15'04	l 14'60	$\frac{1}{w} = 0.10$
	h 14'64			l 16'04				h 15'02			C = 67° 52' 15''33
	13'40	15'30	14'32	15'63	16'56	15'61	15'41	15'86	15'76	15'47	
XLIII & XLV	l 20'68	l 22'00	h 20'26	h 19'58	l 19'70	h 19'14	l 19'40	h 21'16	l 19'34	l 18'76	M = 20''07
	l 20'98	l 21'10	l 20'80	h 19'72	l 21'06	h 19'96	l 19'58	h 21'08	h 19'60	l 18'00	w = 11.82
	h 20'16	l 19'92	l 21'36	h 18'66	l 20'82	h 18'86	l 18'46	h 20'48	h 20'76	l 19'70	$\frac{1}{w} = 0.08$
	h 21'84										C = 58° 1' 20''07
	20'92	21'01	20'81	19'32	20'53	19'32	19'15	20'91	19'90	18'82	
XLV & XLIV	l 58'46	l 59'56	h 56'82	h 56'92	l 56'54	h 57'06	l 56'04	h 56'66	l 59'50	l 55'46	M = 57''48
	l 60'74	l 59'12	l 56'46	h 57'42	l 55'24	h 57'44	l 57'14	h 56'92	h 58'12	l 55'98	w = 7.13
	h 58'52	l 59'34	l 57'78	h 57'80	l 57'20	h 57'68	l 57'34	h 57'92	h 59'14	l 56'50	$\frac{1}{w} = 0.14$
	h 55'96										C = 60° 25' 57''48
	58'42	59'34	57'02	57'38	56'33	57'39	56'84	57'17	58'92	55'98	
XLIV & XL	l 24'48	l 24'94	h 26'50	h 26'92	l 25'84	h 26'92	l 27'08	h 25'06	l 25'62	l 25'04	M = 25''70
	l 24'36	l 25'12	l 25'22	h 27'46	l 25'88	h 25'16	l 25'38	h 25'64	h 25'32	l 25'62	w = 15.40
	h 25'68	l 25'12	l 24'80	h 27'66	l 24'62	h 25'04	l 27'34	h 25'64	h 25'88	l 25'58	$\frac{1}{w} = 0.06$
											C = 67° 39' 25''70
	24'84	25'06	25'51	27'35	25'45	25'71	26'60	25'45	25'61	25'41	

At XLIII											
<i>March 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
XLVII & XLV	"	"	"	"	"	"	"	"	"	"	M = 25".04 w = 10.10 $\frac{1}{w}$ = 0.10 C = 58° 47' 25".05
	h 23° 08	l 24° 92	l 23° 48	h 23° 82	l 26° 86	h 24° 20	l 25° 68	h 27° 74	l 25° 68	l 26° 26	
	h 24° 22	l 23° 40	l 25° 18	h 23° 58	h 25° 76	l 25° 68	h 24° 26	h 26° 40	l 26° 34	l 25° 78	
	l 24° 70	l 23° 12	h 25° 84	l 24° 86	h 24° 58	l 25° 82	h 23° 92	h 25° 24	l 25° 60	l 25° 70	
				h 26° 00				h 25° 70			
	24° 00	23° 81	24° 83	24° 09	25° 80	25° 23	24° 62	26° 27	25° 87	25° 91	
XLV & XLII	h 56° 60	l 55° 58	l 54° 60	h 57° 36	h 55° 74	h 54° 94	l 55° 64	h 55° 82	l 54° 82	l 55° 12	M = 55".30 w = 24.05 $\frac{1}{w}$ = 0.04 C = 60° 6' 55".31
	h 55° 16	l 55° 80	l 55° 10	l 57° 34	h 54° 74	l 54° 00	h 56° 36	h 55° 52	l 54° 12	l 54° 46	
	l 55° 46	l 55° 94	h 56° 12	l 54° 66	h 55° 62	l 54° 10	h 54° 30	h 54° 34	l 55° 10	l 55° 72	
				l 54° 72							
	55° 74	55° 77	55° 27	56° 02	55° 37	54° 35	55° 43	55° 23	54° 68	55° 10	
XLII & XLI	h 24° 66	l 24° 76	l 26° 86	h 23° 90	h 24° 34	h 24° 30	l 25° 46	h 25° 56	l 25° 42	l 23° 66	M = 24".94 w = 27.80 $\frac{1}{w}$ = 0.04 C = 53° 6' 24".94
	h 26° 14	l 25° 34	l 25° 28	l 24° 34	h 24° 00	l 24° 76	l 24° 88	h 25° 06	l 25° 44	l 23° 96	
	l 24° 96	l 25° 18	h 25° 32	l 25° 00	h 23° 90	l 25° 48	l 24° 34	h 25° 16	l 25° 12	l 25° 76	
	25° 25	25° 09	25° 82	24° 41	24° 08	24° 85	24° 89	25° 26	25° 33	24° 46	
At XLIV											
<i>January and February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XL										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 25'	194° 25'	21° 35'	201° 36'	28° 48'	208° 48'	
XL & XLII	"	"	"	"	"	"	"	"	"	"	M = 9".96 w = 14.16 $\frac{1}{w}$ = 0.07 C = 50° 6' 9".96
	h 9° 98	h 8° 26	h 9° 62	h 10° 14	l 10° 92	l 8° 76	h 9° 60	h 10° 12	h 10° 44	h 9° 84	
	h 9° 42	l 10° 76	h 9° 80	h 10° 84	l 9° 68	l 8° 34	h 10° 48	h 10° 58	h 10° 76	l 11° 44	
	h 10° 30	l 8° 80	l 9° 40	h 8° 82	l 10° 26	l 7° 72	h 9° 40	h 10° 92	h 11° 72	l 10° 90	
		l 10° 28									
	9° 90	9° 53	9° 61	9° 93	10° 29	8° 27	9° 83	10° 54	10° 97	10° 73	

At XLIV—(Continued.)											
<i>January and February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XL										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 25'	194° 25'	21° 35'	201° 36'	28° 48'	208° 48'	
XLII & XLV	"	"	"	"	"	"	"	"	"	"	M = 20''28 w = 11 '15 $\frac{1}{w}$ = 0 '09 C = 59° 20' 20''28
	h 21'24	h 18'48	h 18'50	h 21'16	l 20'62	l 21'44	h 20'22	h 19'62	h 19'72	h 22'46	
	h 21'50	l 20'50	h 19'98	h 20'58	l 22'64	l 20'62	h 19'98	h 19'10	h 18'72	l 20'96	
	h 19'14	l 21'20	l 19'38	h 19'66	l 19'68	l 21'28	h 20'80	h 19'52	h 18'70	l 21'86	
	l 19'96	l 20'08			l 20'46						
	20'46	20'07	19'29	20'47	20'85	21'11	20'33	19'41	19'05	21'76	
XLV & XLVI	h 4'86	h 5'58	l 6'20	l 6'28	h 6'24	h 5'88	l 6'14	l 5'20	l 3'50	l 4'24	M = 5''32 w = 26 '04 $\frac{1}{w}$ = 0 '04 C = 60° 50' 5''32
	h 4'00	l 5'10	l 4'72	l 5'56	h 5'82	h 4'42	l 5'64	l 6'02	l 3'98	l 5'08	
	h 6'14	l 5'22	l 6'08	l 4'22	h 5'68	h 5'12	l 5'06	l 5'84	l 4'94	l 5'00	
	h 6'50					h 6'04					
	5'38	5'30	5'67	5'35	5'91	5'37	5'61	5'69	4'14	4'77	
At XLV											
<i>February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
XLVI & XLIV	"	"	"	"	"	"	"	"	"	"	M = 56''12 w = 40 '00 $\frac{1}{w}$ = 0 '03 C = 62° 59' 56''12
	l 56'26	l 57'28	l 56'12	l 55'68	h 56'12	l 57'14	h 55'94	l 56'04	l 56'06	l 56'24	
	h 57'28	l 55'76	l 55'68	h 57'42	l 56'32	l 56'00	l 55'94	l 56'32	l 55'40	l 55'94	
	h 57'04	l 55'80	l 55'14	l 56'20	l 56'58	l 55'48	l 55'30	l 56'64	l 55'18	l 55'28	
	56'86	56'28	55'65	56'43	56'34	56'21	55'73	56'33	55'55	55'82	
XLIV & XLII	l 42'70	l 42'18	l 43'36	l 42'82	l 44'24	l 42'48	h 43'62	l 43'02	l 43'76	l 42'38	M = 42''96 w = 18 '61 $\frac{1}{w}$ = 0 '05 C = 60° 13' 42''96
	h 42'26	l 41'96	l 41'58	h 43'00	l 42'62	l 42'24	l 42'94	l 42'98	l 45'12	l 42'76	
	h 42'14	h 43'04	l 42'52	l 41'62	l 43'42	l 43'08	l 42'36	l 42'72	l 44'94	l 43'80	
	h 43'76										
	42'72	42'39	42'49	42'48	43'43	42'60	42'97	42'91	44'61	42'98	

At XLV—(Continued.)

February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite  
No. 1.

Angle between	Circle readings, telescope being set on XLVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
XLII & XLIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 45''33 <i>w</i> = 4.72 $\frac{1}{w}$ = 0.21 <i>C</i> = 61° 51' 45''33
	h43'20	l41'94	l44'04	h45'76	l45'38	l46'66	l45'56	l46'72	l44'24	l45'34	
	l43'22	l41'64	l45'18	l46'28	l45'08	l45'98	l48'32	l47'06	l45'56	l47'68	
	l43'20	h45'12	h45'96	l45'44	l44'78	l47'94	l47'52	l45'58	l44'42	l46'04	
		h43'40					l45'48				
	43'21	43'03	45'06	45'83	45'08	46'86	46'72	46'45	44'74	46'35	
XLIII & XLVII	l42'12	l42'68	l41'68	h40'00	l41'00	l41'14	l40'98	l41'12	l40'58	l40'40	<i>M</i> = 41''03 <i>w</i> = 15.73 $\frac{1}{w}$ = 0.06 <i>C</i> = 65° 13' 41''03
	l42'68	l39'06	l43'20	l40'46	l40'14	l40'36	l39'32	l41'54	l40'66	l40'26	
	l42'20	h41'82	h40'00	l41'46	l41'42	l40'38	l40'66	l41'90	l42'30	l39'84	
		h40'70									
	42'33	41'07	41'63	40'64	40'85	40'63	40'32	41'52	41'18	40'17	
XLVII & XLVIII	l45'56	h45'82	l45'98	h43'00	l44'86	l45'68	l46'64	l47'22	l46'54	l46'88	<i>M</i> = 46''15 <i>w</i> = 11.45 $\frac{1}{w}$ = 0.09 <i>C</i> = 49° 32' 46''15
	l46'60	h48'30	l46'20	l44'62	l46'14	l46'20	l47'30	l45'10	l47'12	l47'52	
	l46'36	l46'02	l47'14	l44'46	l46'64	l45'62	l47'12	l46'02	l46'22	l46'66	
		l45'46									
	46'17	46'40	46'44	44'03	45'88	45'83	47'02	46'11	46'63	47'02	
XLVIII & XLVI	l9'94	h10'80	l10'92	h11'02	l9'88	l8'68	l7'80	l7'00	l7'88	l8'78	<i>M</i> = 8''75 <i>w</i> = 4.51 $\frac{1}{w}$ = 0.22 <i>C</i> = 60° 8' 8''75
	l9'24	h8'60	l8'94	l11'38	l8'72	l8'18	l7'42	l6'96	l6'58	l6'92	
	l9'02	l11'98	l9'76	l10'16	l8'74	l7'96	l8'10	l6'02	l6'86	l7'92	
		l10'92									
	9'40	10'58	9'87	10'85	9'11	8'27	7'77	6'66	7'11	7'87	

<i>At XLVI</i>											
<i>February 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 18'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	206° 49'	
XLIV & XLV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 59'' <sup>00</sup> <i>w</i> = 11 <sup>14</sup> $\frac{1}{w}$ = 0 <sup>09</sup> <i>C</i> = 56° 9' 59'' <sup>00</sup>
	<i>l</i> 58 <sup>26</sup>	<i>l</i> 58 <sup>66</sup>	<i>l</i> 58 <sup>16</sup>	<i>l</i> 59 <sup>38</sup>	<i>l</i> 57 <sup>98</sup>	<i>h</i> 61 <sup>58</sup>	<i>l</i> 59 <sup>56</sup>	<i>l</i> 57 <sup>10</sup>	<i>h</i> 57 <sup>92</sup>	<i>h</i> 59 <sup>16</sup>	
	<i>l</i> 59 <sup>38</sup>	<i>l</i> 58 <sup>36</sup>	<i>h</i> 58 <sup>36</sup>	<i>l</i> 60 <sup>48</sup>	<i>l</i> 59 <sup>96</sup>	<i>h</i> 60 <sup>18</sup>	<i>l</i> 60 <sup>12</sup>	<i>l</i> 59 <sup>80</sup>	<i>h</i> 57 <sup>40</sup>	<i>l</i> 57 <sup>96</sup>	
	<i>l</i> 59 <sup>24</sup>	<i>l</i> 57 <sup>56</sup>	<i>h</i> 57 <sup>62</sup>	<i>l</i> 59 <sup>86</sup>	<i>l</i> 58 <sup>64</sup>	<i>l</i> 60 <sup>64</sup>	<i>l</i> 58 <sup>60</sup>	<i>l</i> 59 <sup>62</sup>	<i>h</i> 59 <sup>00</sup>	<i>l</i> 58 <sup>96</sup>	
	58 <sup>96</sup>	58 <sup>19</sup>	58 <sup>05</sup>	59 <sup>91</sup>	58 <sup>86</sup>	60 <sup>80</sup>	59 <sup>43</sup>	59 <sup>04</sup>	58 <sup>11</sup>	58 <sup>69</sup>	
XLV & XLVIII	<i>l</i> 49 <sup>70</sup>	<i>l</i> 50 <sup>00</sup>	<i>l</i> 49 <sup>08</sup>	<i>l</i> 47 <sup>36</sup>	<i>l</i> 48 <sup>28</sup>	<i>h</i> 48 <sup>66</sup>	<i>l</i> 48 <sup>98</sup>	<i>l</i> 49 <sup>40</sup>	<i>h</i> 47 <sup>58</sup>	<i>h</i> 49 <sup>68</sup>	<i>M</i> = 48'' <sup>98</sup> <i>w</i> = 17 <sup>20</sup> $\frac{1}{w}$ = 0 <sup>06</sup> <i>C</i> = 61° 3' 48'' <sup>98</sup>
	<i>l</i> 48 <sup>38</sup>	<i>l</i> 49 <sup>96</sup>	<i>h</i> 47 <sup>58</sup>	<i>l</i> 49 <sup>44</sup>	<i>l</i> 48 <sup>14</sup>	<i>h</i> 49 <sup>80</sup>	<i>l</i> 48 <sup>54</sup>	<i>l</i> 50 <sup>00</sup>	<i>h</i> 48 <sup>12</sup>	<i>h</i> 48 <sup>94</sup>	
	<i>l</i> 47 <sup>62</sup>	<i>l</i> 48 <sup>46</sup>	<i>h</i> 48 <sup>70</sup>	<i>l</i> 48 <sup>02</sup>	<i>l</i> 50 <sup>00</sup>	<i>l</i> 50 <sup>30</sup>	<i>l</i> 49 <sup>16</sup>	<i>l</i> 50 <sup>56</sup>	<i>h</i> 48 <sup>62</sup>	<i>l</i> 50 <sup>32</sup>	
	48 <sup>57</sup>	49 <sup>47</sup>	48 <sup>45</sup>	48 <sup>27</sup>	48 <sup>81</sup>	49 <sup>59</sup>	48 <sup>89</sup>	49 <sup>99</sup>	48 <sup>11</sup>	49 <sup>65</sup>	
<i>At XLVII</i>											
<i>March 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on L										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 18'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	206° 49'	
L & XLIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 35'' <sup>37</sup> <i>w</i> = 19 <sup>72</sup> $\frac{1}{w}$ = 0 <sup>05</sup> <i>C</i> = 46° 29' 35'' <sup>38</sup>
	<i>l</i> 34 <sup>36</sup>	<i>h</i> 34 <sup>12</sup>	<i>l</i> 34 <sup>20</sup>	<i>l</i> 35 <sup>48</sup>	<i>l</i> 34 <sup>88</sup>	<i>h</i> 35 <sup>20</sup>	<i>l</i> 35 <sup>36</sup>	<i>l</i> 36 <sup>30</sup>	<i>l</i> 34 <sup>48</sup>	<i>l</i> 35 <sup>44</sup>	
	<i>l</i> 34 <sup>10</sup>	<i>h</i> 35 <sup>20</sup>	<i>l</i> 35 <sup>64</sup>	<i>l</i> 34 <sup>56</sup>	<i>l</i> 35 <sup>14</sup>	<i>l</i> 35 <sup>42</sup>	<i>l</i> 36 <sup>34</sup>	<i>l</i> 35 <sup>84</sup>	<i>l</i> 35 <sup>70</sup>	<i>l</i> 36 <sup>12</sup>	
	<i>l</i> 35 <sup>40</sup>	<i>l</i> 35 <sup>38</sup>	<i>l</i> 33 <sup>94</sup>	<i>l</i> 35 <sup>06</sup>	<i>l</i> 36 <sup>54</sup>	<i>l</i> 36 <sup>60</sup>	<i>l</i> 34 <sup>56</sup>	<i>l</i> 36 <sup>12</sup>	<i>l</i> 35 <sup>84</sup>	<i>l</i> 36 <sup>86</sup>	
	34 <sup>62</sup>	34 <sup>90</sup>	34 <sup>59</sup>	35 <sup>03</sup>	35 <sup>52</sup>	35 <sup>74</sup>	35 <sup>42</sup>	36 <sup>43</sup>	35 <sup>34</sup>	36 <sup>14</sup>	
XLIX & XLVIII	<i>l</i> 48 <sup>40</sup>	<i>h</i> 47 <sup>76</sup>	<i>l</i> 46 <sup>70</sup>	<i>l</i> 44 <sup>94</sup>	<i>l</i> 47 <sup>20</sup>	<i>l</i> 47 <sup>06</sup>	<i>l</i> 46 <sup>16</sup>	<i>l</i> 47 <sup>68</sup>	<i>l</i> 45 <sup>50</sup>	<i>l</i> 46 <sup>74</sup>	<i>M</i> = 46'' <sup>58</sup> <i>w</i> = 21 <sup>55</sup> $\frac{1}{w}$ = 0 <sup>05</sup> <i>C</i> = 54° 45' 46'' <sup>58</sup>
	<i>l</i> 46 <sup>96</sup>	<i>h</i> 45 <sup>90</sup>	<i>l</i> 46 <sup>18</sup>	<i>l</i> 46 <sup>56</sup>	<i>l</i> 46 <sup>96</sup>	<i>l</i> 45 <sup>14</sup>	<i>l</i> 47 <sup>88</sup>	<i>l</i> 46 <sup>32</sup>	<i>l</i> 46 <sup>54</sup>	<i>l</i> 47 <sup>04</sup>	
	<i>l</i> 46 <sup>62</sup>	<i>l</i> 46 <sup>44</sup>	<i>l</i> 48 <sup>52</sup>	<i>l</i> 46 <sup>18</sup>	<i>l</i> 45 <sup>76</sup>	<i>l</i> 46 <sup>34</sup>	<i>l</i> 47 <sup>98</sup>	<i>l</i> 45 <sup>54</sup>	<i>l</i> 45 <sup>32</sup>	<i>l</i> 45 <sup>04</sup>	
			<i>l</i> 46 <sup>62</sup>	<i>l</i> 46 <sup>48</sup>			<i>l</i> 46 <sup>34</sup>				
	47 <sup>33</sup>	46 <sup>70</sup>	47 <sup>01</sup>	46 <sup>04</sup>	46 <sup>64</sup>	46 <sup>18</sup>	47 <sup>34</sup>	46 <sup>47</sup>	45 <sup>79</sup>	46 <sup>27</sup>	

At XLVII—(Continued.)											
<i>March 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on L										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 18'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 49'	
XLVIII & XLV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 5''·03 <i>w</i> = 22·12 $\frac{1}{w}$ = 0·05 <i>C</i> = 69° 50' 5''·04
	<i>h</i> 4'78	<i>h</i> 4'00	<i>h</i> 4'66	<i>h</i> 4'94	<i>l</i> 6'00	<i>l</i> 4'30	<i>l</i> 6'18	<i>l</i> 5'36	<i>h</i> 5'92	<i>h</i> 4'38	
	<i>h</i> 5'36	<i>l</i> 5'20	<i>h</i> 2'96	<i>h</i> 4'18	<i>l</i> 3'66	<i>l</i> 4'30	<i>l</i> 5'58	<i>l</i> 5'38	<i>h</i> 7'14	<i>h</i> 5'18	
	<i>h</i> 6'42	<i>l</i> 5'22	<i>h</i> 4'50	<i>h</i> 4'50	<i>l</i> 4'90	<i>l</i> 5'40	<i>l</i> 5'66	<i>l</i> 4'44	<i>h</i> 4'18	<i>l</i> 5'98	
	5'52	4'81	4'04	4'54	5'21	4'67	5'81	5'06	5'46	5'18	
XLV & XLIII	<i>h</i> 53'60	<i>h</i> 54'42	<i>h</i> 53'94	<i>h</i> 52'60	<i>l</i> 52'72	<i>l</i> 54'92	<i>l</i> 54'58	<i>l</i> 53'92	<i>h</i> 54'06	<i>h</i> 56'06	<i>M</i> = 54''·18 <i>w</i> = 25·60 $\frac{1}{w}$ = 0·04 <i>C</i> = 55° 58' 54''·18
	<i>h</i> 55'24	<i>l</i> 55'06	<i>h</i> 53'66	<i>h</i> 53'96	<i>l</i> 53'62	<i>l</i> 54'74	<i>l</i> 54'76	<i>l</i> 54'44	<i>h</i> 53'86	<i>h</i> 54'10	
	<i>h</i> 53'64	<i>l</i> 54'32	<i>h</i> 53'58	<i>h</i> 54'16	<i>l</i> 52'98	<i>l</i> 54'04	<i>l</i> 54'56	<i>l</i> 54'88	<i>h</i> 54'62	<i>l</i> 54'30	
	54'16	54'60	53'73	53'57	53'11	54'57	54'63	54'41	54'18	54'82	
At XLVIII											
<i>March 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 18'	187° 18'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
XLVI & XLV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 3''·41 <i>w</i> = 23·41 $\frac{1}{w}$ = 0·04 <i>C</i> = 58° 48' 3''·41
	<i>h</i> 3'10	<i>l</i> 2'52	<i>l</i> 2'86	<i>l</i> 3'72	<i>l</i> 2'78	<i>l</i> 3'16	<i>l</i> 3'88	<i>l</i> 3'46	<i>h</i> 3'70	<i>h</i> 3'04	
	<i>l</i> 2'40	<i>l</i> 1'90	<i>l</i> 4'28	<i>l</i> 3'82	<i>l</i> 3'82	<i>l</i> 3'66	<i>l</i> 4'16	<i>l</i> 3'78	<i>l</i> 3'28	<i>l</i> 3'54	
	<i>l</i> 2'92	<i>l</i> 3'00	<i>l</i> 4'98	<i>l</i> 3'02	<i>l</i> 3'02	<i>l</i> 2'48	<i>l</i> 3'62	<i>l</i> 5'30	<i>l</i> 3'72	<i>l</i> 2'64	
	2'81	2'47	4'26	3'52	3'21	3'10	3'89	4'18	3'57	3'07	
XLV & XLVII	<i>h</i> 8'70	<i>l</i> 8'32	<i>h</i> 8'64	<i>l</i> 8'38	<i>l</i> 9'88	<i>l</i> 10'50	<i>l</i> 10'04	<i>l</i> 9'22	<i>h</i> 10'14	<i>h</i> 10'82	<i>M</i> = 9''·38 <i>w</i> = 24·59 $\frac{1}{w}$ = 0·04 <i>C</i> = 60° 37' 9''·38
	<i>l</i> 9'86	<i>l</i> 8'56	<i>l</i> 8'94	<i>l</i> 10'34	<i>l</i> 8'02	<i>l</i> 9'22	<i>l</i> 9'88	<i>l</i> 10'26	<i>l</i> 10'28	<i>l</i> 9'56	
	<i>l</i> 7'56	<i>l</i> 9'12	<i>l</i> 8'80	<i>l</i> 9'54	<i>l</i> 9'06	<i>l</i> 10'42	<i>l</i> 9'82	<i>l</i> 8'68	<i>l</i> 9'36	<i>l</i> 9'22	
	<i>l</i> 9'04										
	8'79	8'67	8'79	9'42	8'99	10'05	9'91	9'39	9'93	9'87	

At XLVIII—(Continued.)											
March 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on LXVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 18'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 49'	
XLVII & XLIX	"	"	"	"	"	"	"	"	"	"	M = 50''·59 w = 17·78 $\frac{1}{w}$ = 0·06 C = 79° 15' 50''·59
	h 50'·36	l 49'·92	h 51'·10	l 50'·12	h 49'·42	h 49'·66	h 49'·76	h 48'·72	h 51'·68	h 50'·02	
	h 50'·76	l 51'·52	h 50'·78	l 51'·52	h 49'·02	l 52'·20	h 50'·80	l 50'·64	h 50'·80	h 50'·66	
	l 49'·90	l 50'·92	h 50'·88	l 50'·80	h 50'·04	l 52'·24	h 49'·02	l 51'·66	h 52'·36	h 51'·58	
						l 50'·40		l 49'·82			
	50'·34	50'·79	50'·92	50'·81	49'·49	51'·13	49'·86	50'·21	51'·61	50'·75	
XLIX & LI	h 54'·66	l 55'·30	h 54'·52	l 55'·50	h 55'·22	h 55'·08	h 52'·06	h 56'·32	h 54'·06	h 54'·12	M = 54''·86 w = 19·77 $\frac{1}{w}$ = 0·05 C = 47° 54' 54''·85
	h 54'·76	l 55'·14	h 56'·40	l 53'·68	h 55'·76	l 56'·28	h 54'·32	l 54'·98	h 54'·88	h 54'·80	
	l 54'·30	l 55'·12	h 54'·92	l 54'·48	h 55'·60	l 55'·50	h 55'·22	l 54'·08	h 53'·06	h 55'·26	
						h 54'·32					
	54'·57	55'·19	55'·28	54'·55	55'·53	55'·62	53'·98	55'·13	54'·00	54'·73	
At XLIX											
April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on LI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
LI & XLVIII	"	"	"	"	"	"	"	"	"	"	M = 42''·64 w = 38·30 $\frac{1}{w}$ = 0·03 C = 71° 50' 42''·64
	h 42'·62	l 42'·70	l 42'·36	l 40'·78	h 41'·72	l 42'·34	h 42'·26	l 42'·54	l 43'·50	l 41'·98	
	h 42'·90	l 43'·40	l 42'·10	l 41'·76	h 42'·50	l 43'·28	l 43'·56	l 42'·68	l 42'·22	l 43'·90	
	h 42'·72	l 42'·18	h 41'·76	l 43'·24	h 42'·32	l 43'·60	l 42'·84	h 43'·14	l 42'·66	l 41'·38	
				l 44'·56						l 42'·62	
	42'·75	42'·76	42'·07	42'·59	42'·18	43'·07	42'·89	42'·79	42'·79	42'·47	
XLVIII & XLVII	h 23'·38	l 21'·00	l 20'·88	l 24'·16	h 24'·44	l 24'·72	h 23'·54	l 22'·92	l 21'·50	l 22'·44	M = 22''·53 w = 7·53 $\frac{1}{w}$ = 0·13 C = 45° 58' 22''·53
	h 22'·48	l 21'·02	l 21'·50	l 22'·68	h 23'·94	l 23'·08	l 22'·10	l 22'·64	l 22'·70	l 20'·22	
	h 22'·20	l 20'·88	h 20'·78	l 22'·34	h 22'·90	l 23'·22	l 23'·28	h 23'·84	l 23'·52	l 20'·24	
			h 21'·86				h 24'·28			l 20'·76	
	22'·69	20'·97	21'·26	23'·06	23'·76	23'·67	22'·97	23'·42	22'·57	20'·92	

At XLIX—(Continued.)											
<i>April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	186° 2'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
XLVII & L	"	"	"	"	"	"	"	"	"	"	M = 10''·73 w = 6·82 $\frac{1}{w}$ = 0·15 C = 62° 15' 10''·73
	h 10° 08	l 11° 90	l 12° 52	l 10° 08	h 8° 56	l 9° 74	h 8° 02	l 10° 42	l 11° 56	l 11° 74	
	h 10° 50	l 10° 24	h 12° 88	l 10° 54	h 9° 72	l 9° 62	l 10° 38	l 9° 60	l 11° 00	l 12° 84	
	h 10° 56	l 11° 94	h 12° 64	l 9° 86	h 10° 64	l 9° 58	l 10° 52	h 9° 32	l 11° 04	l 13° 00	
	10° 38	11° 36	12° 68	10° 16	9° 64	9° 65	9° 88	9° 78	11° 20	12° 53	
L & LII	h 53° 32	l 52° 70	l 53° 64	l 52° 58	h 55° 60	l 55° 86	h 54° 94	l 52° 96	l 52° 66	l 54° 86	M = 53''·76 w = 9·90 $\frac{1}{w}$ = 0·10 C = 61° 25' 53''·76
	h 53° 94	l 54° 28	h 51° 50	l 53° 64	h 54° 50	l 53° 94	l 53° 18	h 53° 92	l 52° 88	l 54° 56	
	h 52° 70	l 54° 02	h 52° 56	l 54° 52	h 53° 34	l 55° 12	l 53° 50	h 54° 42	l 51° 42	l 55° 86	
	53° 32	53° 67	52° 57	53° 58	54° 48	54° 97	53° 87	53° 77	52° 32	55° 09	
LII & LIII	h 39° 08	l 37° 86	l 39° 52	l 40° 00	h 39° 70	l 38° 24	h 39° 10	l 39° 00	l 41° 98	l 39° 18	M = 39''·04 w = 5·31 $\frac{1}{w}$ = 0·19 C = 58° 0' 39''·04
	h 38° 94	l 38° 18	h 38° 14	l 39° 10	h 38° 66	l 37° 34	l 38° 66	h 37° 32	l 41° 84	l 39° 30	
	h 39° 84	l 37° 28	h 38° 88	l 36° 82	h 39° 70	l 37° 00	l 39° 32	h 39° 24	l 42° 86	l 40° 42	
			l 37° 02								
	39° 29	37° 77	38° 85	38° 24	39° 35	37° 53	39° 03	38° 52	42° 23	39° 63	
LIII & LI	h 12° 04	l 12° 52	l 12° 14	l 11° 68	h 10° 24	l 11° 28	h 11° 50	l 11° 56	l 9° 62	l 9° 22	M = 11''·30 w = 5·43 $\frac{1}{w}$ = 0·18 C = 60° 29' 11''·30
	h 12° 10	l 11° 56	h 13° 12	l 11° 16	h 11° 96	l 11° 58	h 11° 78	h 12° 60	l 9° 72	l 8° 64	
	h 11° 06	l 13° 00	h 12° 86	l 13° 06	h 12° 10	l 11° 16	l 10° 72	h 10° 34	l 8° 92	l 8° 06	
			l 13° 34			l 10° 66	h 12° 98				
	11° 73	12° 36	12° 71	12° 31	11° 43	11° 34	11° 17	11° 87	9° 42	8° 64	
At L											
<i>April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 18'	14° 24'	194° 24'	21° 35'	201° 35'	28° 49'	208° 49'	
LII & XLIX	"	"	"	"	"	"	"	"	"	"	M = 47''·38 w = 13·27 $\frac{1}{w}$ = 0·08 C = 61° 27' 47''·38
	h 44° 86	h 45° 62	l 47° 56	l 45° 78	l 46° 88	l 47° 74	l 47° 62	l 48° 36	l 49° 22	l 48° 50	
	h 46° 28	h 47° 46	l 46° 44	l 47° 54	l 47° 62	l 48° 42	l 47° 96	l 48° 78	l 47° 96	l 48° 62	
	h 46° 58	h 46° 94	l 46° 64	l 47° 90	l 48° 42	l 46° 96	l 47° 08	l 48° 58	l 46° 26	l 47° 24	
									l 47° 24		
	45° 91	46° 67	46° 88	47° 07	47° 64	47° 71	47° 55	48° 57	47° 67	48° 12	



At L—(Continued.)											
<i>April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 13'	14° 24'	194° 24'	21° 35'	201° 35'	28° 48'	208° 48'	
XLIX & XLVII	"	"	"	"	"	"	"	"	"	"	M = 14" 86 w = 19 60 $\frac{1}{w} = 0 05$ C = 71° 15' 14" 86
	h 14' 14	h 15' 70	l 14' 88	l 15' 84	l 15' 32	l 14' 70	l 14' 12	l 14' 84	l 14' 32	l 16' 78	
	h 14' 44	h 15' 72	l 15' 20	l 13' 70	l 14' 12	l 14' 78	l 13' 62	l 15' 28	l 14' 82	l 15' 52	
	h 13' 08	h 14' 86	l 13' 42	l 14' 96	l 14' 36	l 14' 74	l 15' 36	l 15' 06	l 15' 84	l 16' 28	
	13' 89	15' 43	14' 50	14' 83	14' 60	14' 74	14' 37	15' 06	14' 99	16' 19	
At LI											
<i>March and April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 48'	
XLVIII & XLIX	"	"	"	"	"	"	"	"	"	"	M = 22" 70 w = 5 58 $\frac{1}{w} = 0 18$ C = 60° 14' 22" 71
	h 21' 92	l 22' 24	l 22' 52	l 22' 54	l 23' 54	l 25' 48	l 22' 74	l 21' 74	l 22' 38	l 18' 82	
	h 21' 98	l 20' 94	l 21' 06	l 23' 52	l 23' 52	l 26' 62	l 24' 46	l 23' 04	l 23' 26	l 24' 60	
	h 21' 74	l 22' 32	l 21' 32	l 21' 58	l 23' 66	l 24' 18	l 24' 90	l 22' 42	l 22' 60	l 22' 46	
					l 26' 00	l 21' 90		l 20' 82	l 21' 32		
	21' 88	21' 83	21' 63	22' 55	23' 57	25' 57	23' 50	22' 40	22' 27	21' 80	
XLIX & RM	d 46' 66	d 46' 76	d 42' 67	d 45' 17	h 45' 94	l 45' 58	l 46' 72	l 46' 00	l 46' 06	l 46' 74	M = 45" 79 w = 6 85 $\frac{1}{w} = 0 15$ C = 32° 29' 45" 80
	d 47' 02	d 45' 96	d 44' 65	d 44' 29	l 45' 86	l 43' 64	l 45' 48	l 45' 24	l 44' 18	l 44' 96	
	d 47' 14	d 45' 10	d 42' 79	d 44' 67	d 46' 27	l 46' 50	l 46' 66	l 46' 70	l 45' 72	l 47' 76	
				d 47' 53	d 45' 19	d 46' 49		l 47' 54	d 48' 83		
	46' 94	45' 94	43' 37	44' 71	46' 40	45' 23	46' 34	45' 98	45' 88	47' 07	
RM & LIII	l 44' 98	l 44' 84	l 47' 72	h 47' 96	h 45' 78	l 47' 66	l 45' 38	l 49' 30	l 47' 96	l 44' 24	M = 46" 86 w = 10 35 $\frac{1}{w} = 0 10$ C = 29° 57' 46" 87
	l 46' 26	l 47' 12	l 46' 74	h 47' 00	h 44' 68	l 47' 48	l 45' 74	l 48' 10	l 48' 98	l 45' 04	
	l 45' 20	l 47' 18	l 46' 74	h 47' 14	l 47' 58	l 48' 06	l 47' 26	l 47' 18	l 47' 18	l 45' 76	
	l 48' 28		l 47' 06	l 47' 26	d 47' 68	d 46' 33	l 46' 82	l 47' 30	d 47' 35		
				d 46' 70	d 47' 96						
	45' 48	46' 86	47' 07	47' 29	46' 66	47' 72	46' 18	47' 85	47' 86	45' 60	

At LI—(Continued.)											
<i>March and April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on XLVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 48'	
LIII & LV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 47''·28 <i>w</i> = 7·63 $\frac{1}{w}$ = 0·13 <i>C</i> = 75° 9' 47''·27
	l 48'·14	l 47'·78	l 47'·98	h 44'·00	h 46'·56	l 45'·90	l 48'·50	l 48'·66	l 48'·12	l 51'·18	
	l 45'·96	l 46'·94	l 47'·78	h 45'·40	h 46'·46	l 46'·92	l 47'·50	l 48'·04	l 46'·06	l 49'·62	
	l 46'·24	l 48'·36	l 47'·40	l 46'·24	l 47'·22	l 45'·38	l 46'·32	l 47'·34	l 48'·28	l 48'·18	
	l 48'·80			l 47'·06	l 45'·28				l 46'·50	l 47'·96	
				l 46'·32							
	47'·29	47'·69	47'·72	45'·68	46'·37	46'·07	47'·44	48'·01	47'·24	49'·24	
At LII											
<i>April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
LIV & LIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 48''·37 <i>w</i> = 14·65 $\frac{1}{w}$ = 0·07 <i>C</i> = 59° 23' 48''·38
	h 48'·04	h 49'·26	l 48'·08	l 47'·60	l 46'·76	l 48'·32	h 48'·90	h 50'·42	l 46'·38	l 44'·24	
	h 48'·34	h 48'·52	l 47'·02	l 49'·14	l 48'·64	l 47'·34	h 49'·62	h 48'·68	l 47'·72	l 50'·44	
	h 47'·66	h 49'·16	l 48'·16	l 48'·46	l 49'·00	l 47'·78	h 47'·84	l 47'·92	l 49'·84	l 47'·80	
								l 49'·64	l 50'·74	l 49'·56	
	48'·01	48'·98	47'·75	48'·40	48'·13	47'·81	48'·79	49'·17	48'·67	48'·01	
LIII & XLIX	h 27'·68	h 26'·60	l 25'·84	l 27'·20	l 28'·86	l 27'·72	h 25'·58	h 25'·44	l 30'·36	l 31'·28	<i>M</i> = 27''·31 <i>w</i> = 6·43 $\frac{1}{w}$ = 0·16 <i>C</i> = 57° 38' 27''·32
	h 26'·38	h 26'·70	l 26'·94	l 25'·74	l 27'·20	l 28'·76	h 26'·36	h 26'·24	l 29'·48	l 27'·38	
	h 27'·14	h 26'·24	l 26'·10	l 26'·78	l 26'·98	l 26'·72	h 27'·30	l 27'·46	l 28'·54	l 29'·86	
									l 27'·48		
	27'·07	26'·51	26'·29	26'·57	27'·68	27'·73	26'·41	26'·38	29'·46	29'·00	
XLIX & L	h 17'·64	h 17'·54	l 19'·18	l 18'·74	l 18'·52	l 19'·22	h 17'·68	h 18'·76	l 17'·60	l 16'·20	<i>M</i> = 18''·73 <i>w</i> = 14·36 $\frac{1}{w}$ = 0·07 <i>C</i> = 57° 6' 18''·73
	h 19'·14	h 18'·10	l 18'·52	l 20'·22	l 19'·96	l 20'·68	h 17'·42	h 19'·38	l 18'·88	l 17'·96	
	h 18'·16	h 18'·50	l 19'·16	l 20'·06	l 19'·52	l 19'·44	h 17'·90	l 19'·40	l 18'·06	l 18'·88	
									l 19'·80		
	18'·31	18'·05	18'·95	19'·67	19'·33	19'·78	17'·67	19'·18	18'·18	18'·21	

At LIII											
April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on LI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 18'	14° 24'	194° 25'	21° 36'	201° 36'	28° 49'	206° 49'	
LI & XLIX	"	"	"	"	"	"	"	"	"	"	M = 17''·09 w = 28·15 $\frac{1}{w} = 0·04$ C = 57° 3' 17''·08
	h17·78	l16·42	h17·00	l16·18	l18·22	l17·34	h16·62	l17·58	l16·94	h15·90	
	l16·86	l17·12	h18·50	l17·10	l16·42	l16·86	h16·82	l18·04	l15·56	h17·32	
	l15·50	l16·64	l18·44	l18·16	l17·06	l18·02	h17·22	l16·72	l18·12	h16·86	
									l15·80		
	16·71	16·73	17·98	17·15	17·23	17·41	16·89	17·45	16·61	16·69	
XLIX & LII	h54·64	l53·88	h54·68	l53·06	l53·48	l54·60	h54·10	l53·98	l51·42	h55·34	M = 53''·94 w = 7·50 $\frac{1}{w} = 0·13$ C = 64° 20' 53''·94
	l54·28	l53·12	h54·68	l54·74	l53·04	l54·76	h53·26	l53·80	l52·00	h55·96	
	l55·44	l52·90	l53·60	l54·46	l52·60	l54·62	h53·36	l54·30	l51·70	h56·34	
	54·79	53·30	54·32	54·09	53·04	54·66	53·57	54·03	51·71	55·88	
LII & LIV	h26·38	l27·58	h27·84	l27·22	l28·54	h27·46	h29·30	l29·40	l27·20	h29·54	M = 27''·98 w = 11·60 $\frac{1}{w} = 0·09$ C = 63° 0' 27''·98
	l26·66	l27·12	h25·76	l27·32	l29·72	l28·32	h29·40	l28·00	l20·20	h27·08	
	l28·48	l26·10	l26·98	l28·22	l29·16	l28·06	h27·94	l29·18	l28·92	h27·22	
						l28·00				h27·86	
	27·17	26·93	26·86	27·59	29·14	27·96	28·88	28·86	28·44	27·93	
LIV & LVI	l13·82	l11·46	h12·26	l12·86	l14·14	l14·46	h9·82	l12·92	l13·70	h10·38	M = 12''·30 w = 8·80 $\frac{1}{w} = 0·11$ C = 58° 14' 12''·30
	l12·18	l12·54	h12·26	l12·52	l12·70	l13·32	h9·82	l12·10	l12·12	h10·78	
	l12·84	l12·58	l11·48	l11·92	l12·92	l12·84	h11·18	l12·70	l12·70	h11·68	
	12·95	12·19	12·00	12·43	13·25	13·54	10·27	12·57	12·84	10·95	
LVI & LV	l17·92	l19·46	h20·38	l18·32	h18·96	h19·76	h22·36	l18·28	l20·94	h18·36	M = 19''·66 w = 5·60 $\frac{1}{w} = 0·18$ C = 61° 59' 19''·66
	l17·28	l19·54	h20·68	l17·92	h19·34	h20·80	h22·40	l19·48	l19·42	h19·08	
	l18·96	l21·00	l18·66	l18·64	h18·92	h20·68	h22·74	l19·36	l20·78	h19·32	
	18·05	20·00	19·91	18·29	19·07	20·41	22·50	19·04	20·38	18·92	
LV & LI	l50·54	l50·88	h47·92	l50·16	h49·90	h47·90	h48·24	l48·42	l49·44	h48·84	M = 49''·52 w = 8·50 $\frac{1}{w} = 0·12$ C = 55° 21' 49''·52
	l51·78	l51·22	h48·28	l50·76	h49·68	h48·40	h48·34	l48·56	l49·94	h50·64	
	l50·00	l50·72	l50·14	l50·34	h51·48	h48·84	h47·80	l49·18	l48·50	h48·84	
	50·77	50·94	48·78	50·42	50·35	48·38	48·13	48·72	49·31	49·44	

At LIV

\*April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†January 1861, observed by Lieutenants J. Herschel and H. R. Thuilier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on LVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	186° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	28° 49'	208° 49'	
* LVIII & LVI	"	"	"	"	"	"	"	"	"	"	M = 43''·01
	l 40° 02	h 40° 82	h 42° 46	h 42° 22	l 44° 02	h 42° 80	l 41° 66	l 43° 76	l 43° 10	l 43° 16	
	l 41° 96	h 42° 24	h 43° 08	h 43° 42	l 44° 32	h 42° 52	l 43° 56	l 44° 16	l 44° 46	l 43° 76	
	l 42° 00	h 42° 22	h 42° 34	l 43° 32	l 43° 92	h 43° 26	l 43° 64	l 44° 30	l 44° 60	l 43° 12	
	41° 33	41° 76	42° 63	42° 99	44° 09	42° 86	42° 95	44° 07	44° 05	43° 35	
Lesser Circle-reading	301° 17'	121° 16'	308° 28'	128° 28'	315° 41'	135° 41'	322° 53'	142° 53'	330° 5'	150° 5'	
† LVIII & LVI	h 43° 04	h 46° 40	h 45° 46	h 44° 48	h 44° 62	h 43° 14	l 41° 68	l 44° 12	l 44° 22	l 44° 28	w = 19·46 1/w = 0·05 C = 58° 43' 43''·67
	h 43° 64	h 45° 32	h 43° 66	h 43° 72	h 46° 00	l 42° 28	l 42° 20	l 44° 38	l 46° 74	l 44° 68	
	h 44° 76	h 44° 96	h 44° 52	h 43° 84	h 44° 56	l 43° 34	l 44° 70	l 43° 76	l 44° 04	l 45° 92	
						l 41° 36		l 45° 92			
						l 46° 96					
						l 43° 88					
	43° 81	45° 56	44° 55	44° 01	45° 06	42° 92	43° 46	44° 09	45° 23	44° 96	M = 44''·36
* LVI & LVIII	Circle readings, telescope being set on LVI										M = 33''·47 w = 16·64 1/w = 0·06 C = 62° 15' 33''·47
	58° 45'	238° 45'	65° 56'	245° 56'	78° 8'	258° 8'	80° 19'	260° 19'	87° 82'	267° 32'	
	"	"	"	"	"	"	"	"	"	"	
	l 34° 00	h 34° 18	h 32° 46	h 35° 22	l 33° 48	h 33° 36	l 34° 42	l 35° 32	l 35° 78	l 32° 70	
	l 32° 36	h 33° 24	h 31° 58	h 32° 98	l 32° 52	h 34° 18	l 32° 58	l 33° 28	l 32° 60	l 33° 94	
	l 31° 42	h 34° 66	h 33° 60	l 32° 12	l 33° 60	h 33° 64	l 32° 76	l 34° 84	l 33° 92	l 33° 74	
	l 32° 54			l 33° 90					l 33° 16		
	32° 58	34° 03	32° 55	33° 56	33° 20	33° 73	33° 25	34° 48	33° 87	33° 46	

At LIV—(Continued.)											
*April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	58° 45'	238° 45'	65° 56'	245° 56'	78° 8'	253° 8'	80° 19'	260° 19'	87° 32'	267° 32'	
* LIII & LII	"	"	"	"	"	"	"	"	"	"	M = 43''·88 w = 15 ·00 $\frac{1}{w}$ = 0 ·07 C = 57° 35' 43''·88
	l 44'·20	h 43'·20	h 43'·22	h 42'·44	l 44'·54	h 44'·10	l 45'·16	l 44'·96	l 42'·06	l 43'·36	
	l 43'·80	h 43'·96	h 42'·94	h 43'·78	l 44'·32	h 43'·74	l 44'·46	l 45'·22	l 43'·94	l 42'·84	
	l 44'·82	h 42'·22	h 43'·52	l 45'·80	l 44'·74	h 44'·16	l 45'·20	l 44'·20	l 43'·46	l 43'·58	
			l 41'·82								
	44'·27	43'·13	43'·23	43'·46	44'·53	44'·00	44'·94	44'·79	43'·15	43'·26	
At LV											
‡April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
§January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 25'	194° 25'	21° 35'	201° 38'	28° 48'	208° 48'	
‡ LI & LIII	"	"	"	"	"	"	"	"	"	"	M = 23''·95 w = 18 ·48 $\frac{1}{w}$ = 0 ·05 C = 49° 28' 23''·96
	h 24'·42	h 22'·52	l 24'·36	l 24'·06	l 22'·46	l 22'·22	h 23'·36	l 27'·82	l 24'·06	l 24'·34	
	h 24'·66	h 25'·40	l 25'·04	l 25'·12	l 24'·22	l 23'·32	h 24'·06	l 23'·80	l 23'·96	l 24'·16	
	h 23'·14	h 24'·24	l 24'·50	l 23'·52	l 22'·54	l 24'·32	h 24'·02	l 22'·54	l 22'·86	l 23'·80	
		h 24'·78					l 23'·46				
	24'·07	24'·24	24'·63	24'·23	23'·07	23'·29	23'·81	24'·41	23'·63	24'·10	
‡ LIII & LVI	h 54'·32	h 54'·68	l 57'·48	l 56'·24	l 57'·34	l 56'·02	h 55'·20	l 54'·68	l 59'·12	l 59'·38	M = 56''·35 w = 4 ·02 $\frac{1}{w}$ = 0 ·25 C = 50° 53' 56''·35
	h 55'·10	h 54'·10	l 58'·42	l 54'·42	l 56'·48	l 55'·12	h 54'·30	l 55'·96	l 58'·76	l 59'·24	
	h 55'·88	h 55'·10	l 55'·06	l 55'·34	l 56'·56	l 55'·88	l 56'·18	l 57'·42	l 58'·84	l 58'·00	
		l 56'·94					l 55'·76				
	55'·10	54'·63	56'·98	55'·33	56'·79	55'·67	55'·23	55'·96	58'·91	58'·87	

At LV—(Continued.)											
‡April 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
§January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 25'	194° 25'	21° 35'	201° 36'	28° 49'	206° 49'	
† LVI & LVII	"	"	"	"	"	"	"	"	"	"	M = 50° 29
	h 49° 04	h 51° 86	l 51° 14	l 51° 64	l 52° 94	l 49° 78	h 46° 54	l 49° 96	l 49° 02	l 47° 94	
	h 50° 28	h 51° 94	l 50° 26	l 52° 12	l 50° 08	l 51° 24	h 49° 24	l 50° 02	l 49° 94	l 48° 10	
	h 50° 38	h 51° 38	l 53° 70	l 50° 64	l 50° 08	l 49° 00	l 49° 96	l 49° 86	l 49° 64	l 50° 00	
		l 52° 04		l 49° 30		l 51° 24					
	49° 90	51° 73	51° 79	51° 47	50° 60	50° 01	49° 25	49° 95	49° 53	48° 68	
Lesser Circle-reading	300° 14'	120° 14'	307° 26'	127° 26'	314° 38'	134° 38'	321° 49'	141° 50'	329° 2'	148° 2'	w = 14.02
§ LVI & LVII	h 52° 64	h 52° 00	h 50° 52	h 52° 12	h 50° 12	l 51° 46	l 51° 58	l 52° 08	l 49° 12	l 48° 42	I w = 0.07 C = 59° 46' 50".54
	h 52° 56	h 50° 78	h 50° 12	h 51° 30	l 48° 96	l 49° 82	l 50° 84	l 51° 60	l 49° 82	l 48° 70	
	h 51° 92	h 52° 62	h 50° 32	h 51° 00	l 49° 44	l 51° 48	l 50° 72	l 51° 14	l 50° 40	l 49° 34	
	52° 37	51° 80	50° 32	51° 47	49° 51	50° 92	51° 05	51° 61	49° 78	48° 82	M = 50° 77
At LVI											
*May 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	206° 49'	
* LIX & LVII	h 40° 06	h 41° 28	l 37° 22	l 39° 72	h 42° 20	l 42° 30	h 40° 36	l 36° 68	l 39° 44	l 37° 26	M = 39° 85
	h 40° 68	l 41° 18	l 37° 96	l 39° 54	h 41° 92	l 41° 34	l 37° 34	l 38° 92	l 40° 62	l 38° 60	
	h 40° 86	l 37° 72	l 39° 18	l 40° 04	h 43° 64	l 41° 64	l 40° 40	l 37° 44	l 40° 24	l 38° 88	
	h 40° 42	l 39° 76					l 40° 98	l 37° 68			
	40° 51	39° 99	38° 12	39° 77	42° 59	41° 76	39° 77	37° 68	40° 10	38° 25	

At LVI—(Continued.)											
*May 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	260° 47'	80° 47'	268° 0'	88° 0'	275° 11'	95° 11'	282° 23'	102° 23'	289° 36'	109° 36'	
† LIX & LVII	"	"	"	"	"	"	"	"	"	"	w = 15.68 1/w = 0.06 C = 62° 23' 39".61
	h42.28	h40.34	h38.96	l38.38	h41.16	h40.36	l38.58	h38.24	h40.28	h39.80	
	h41.32	h38.92	h40.50	l38.68	h39.40	h38.52	l38.46	h37.56	h38.76	h39.62	M = 39".52
	h41.46	h38.68	h40.52	h39.72	h40.78	l39.46	h38.66	h38.92	h41.02	h38.66	
	l40.34										
	l39.74										
	l39.84										
	40.83	39.31	39.99	38.93	40.45	39.45	38.57	38.24	40.02	39.36	
Lesser Circle-reading	62° 25'	242° 25'	69° 36'	249° 36'	76° 48'	256° 48'	83° 59'	264° 0'	91° 12'	271° 12'	
* LVII & LV	h13.52	h12.48	l16.54	l12.74	h15.44	l13.78	h14.58	l17.76	l13.06	l15.34	M = 14".27
	h14.72	l10.88	l15.30	l14.66	h14.96	l13.46	l13.48	l15.22	l12.44	l14.18	
	h14.62	l14.54	l15.04	l13.22	h13.52	l14.14	l12.48	l16.40	l13.72	l14.10	
		l15.64						l15.70			
	14.29	13.39	15.63	13.54	14.64	13.79	13.51	16.27	13.07	14.54	
Lesser Circle-reading	823° 10'	143° 10'	380° 23'	150° 23'	337° 34'	157° 34'	344° 47'	164° 47'	351° 59'	171° 59'	
† LVII & LV	h13.22	h13.60	l14.32	l12.04	h15.08	h11.92	l11.88	h16.14	h12.02	h14.78	w = 16.57 1/w = 0.06 C = 49° 50' 13".88
	h12.68	h13.84	l14.36	l12.94	h14.32	h12.42	l11.98	h15.72	h12.88	h12.78	
	h13.30	h13.98	l13.26	h14.04	h13.32	l13.14	l11.22	h15.62	h12.06	h14.14	M = 13".55
							l15.54	l14.28			
							l15.06				
							l13.58				
	13.07	13.81	13.98	13.01	14.24	12.49	13.21	15.44	12.32	13.90	
Circle readings, telescope being set on LV											
	112° 15'	292° 15'	119° 26'	299° 27'	126° 38'	306° 38'	133° 50'	313° 50'	141° 2'	321° 2'	M = 44".92
* LV & LIII	"	"	"	"	"	"	"	"	"	"	w = 11.12 1/w = 0.09 C = 67° 6' 44".91
	h47.88	h44.70	l44.40	l45.38	h44.54	l45.18	h44.30	l42.68	l46.76	l46.84	
	h44.76	l43.14	l44.76	l43.70	h44.06	l45.42	l45.06	l43.32	l45.50	l46.04	
	h45.20	l42.78	l46.14	l45.56	h46.84	l43.60	l45.56	l43.70	l44.36	l45.06	
	h45.60	l43.70			l44.50			l44.56			
	45.86	43.58	45.10	44.88	44.99	44.73	44.97	43.57	45.54	45.98	

At LVI—(Continued.)

\*May 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on LV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	112° 15'	292° 15'	119° 26'	299° 27'	126° 38'	306° 38'	133° 50'	319° 50'	141° 2'	321° 2'	
* LVIII & LIV	"	"	"	"	"	"	"	"	"	"	M = 16'' 06 w = 12 66 $\frac{1}{w}$ = 0 08 C = 59° 30' 16'' 05
	h 14° 90	l 13° 56	l 16° 56	l 17° 56	h 15° 64	l 15° 02	h 16° 52	l 13° 12	l 16° 72	l 16° 62	
	h 16° 40	l 16° 72	l 17° 18	l 15° 56	h 15° 34	l 16° 02	l 17° 30	l 16° 50	l 16° 26	l 17° 14	
	h 16° 28	l 15° 94	l 16° 54	l 14° 42	h 13° 92	l 16° 68	l 17° 90	l 16° 08	l 14° 72	l 17° 44	
		l 16° 02		l 15° 96				l 16° 16			
	15° 86	15° 56	16° 76	15° 88	14° 97	15° 91	17° 24	15° 47	15° 90	17° 07	
* LIV & LVIII	h 2° 96	l 4° 10	l 5° 68	l 1° 04	h 4° 78	l 2° 42	h 4° 04	l 6° 74	l 1° 66	l 3° 16	M = 3'' 31
	h 2° 52	l 1° 26	l 4° 92	l 2° 40	h 3° 02	l 1° 94	l 4° 30	l 2° 96	l 3° 78	l 3° 76	
	h 2° 30	l 3° 62	l 3° 68	l 3° 00	h 3° 94	l 2° 40	l 2° 72	l 3° 76	l 3° 78	l 4° 26	
		l 2° 14						l 3° 10			
	2° 59	2° 78	4° 76	2° 15	3° 91	2° 25	3° 69	4° 14	3° 07	3° 73	
Lesser Circle-reading	139° 38'	319° 38'	146° 51'	326° 50'	154° 2'	334° 1'	161° 14'	341° 14'	168° 27'	348 27'	
† LVIII & LVIII	h 60° 48	h 61° 02	h 60° 16	l 65° 58	h 62° 66	h 64° 06	h 62° 88	h 63° 02	h 64° 06	h 60° 06	w = 17 24 $\frac{1}{w}$ = 0 06 C = 62° 18' 2'' 92 M = 2'' 40
	h 62° 90	h 61° 20	h 59° 96	l 62° 50	h 62° 38	h 63° 78	h 62° 70	h 62° 92	h 63° 40	h 61° 58	
	h 62° 46	h 62° 00	h 62° 12	l 62° 66	h 63° 24	h 63° 22	h 61° 96	h 63° 42	h 62° 66	h 61° 22	
			l 63° 34								
	61° 95	61° 41	60° 75	63° 52	62° 76	63° 69	62° 51	63° 12	63° 37	60° 95	
Lesser Circle-reading	301° 10'	121° 10'	308° 21'	128° 22'	315° 33'	135° 33'	322° 45'	142° 45'	329° 57'	149° 58'	
* LVIII & LIX	h 60° 06	l 62° 16	l 60° 16	l 62° 88	h 57° 16	l 62° 42	h 59° 38	l 62° 02	l 62° 70	l 60° 14	M = 1'' 10
	h 60° 68	l 62° 50	l 59° 40	l 63° 90	h 58° 62	l 61° 02	l 59° 72	l 62° 58	l 61° 04	l 61° 04	
	h 60° 76	l 63° 62	l 60° 96	l 62° 72	h 59° 14	l 60° 26	l 61° 70	l 63° 18	l 61° 46	l 59° 82	
		l 63° 48				l 59° 64	l 62° 08				
	60° 50	62° 94	60° 17	63° 17	58° 31	61° 23	60° 11	62° 47	61° 73	60° 33	



At LVI—(Continued.)											
*May 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	201° 56'	21° 56'	209° 9'	23° 9'	216° 20'	36° 20'	23° 32'	43° 32'	230° 45'	50° 45'	
† LVIII & LIX	"	"	"	"	"	"	"	"	"	"	
	h 2'30	h 1'04	h 5'28	l 5'64	h 1'04	h 1'56	h 3'78	h 2'16	h 0'92	h 1'70	w = 17 '26
	h 0'34	h 2'86	h 2'72	l 1'20	h 2'74	h 2'96	h 1'12	h 2'28	h 2'46	h 2'02	$\frac{l}{w} = 0 '06$
	h 2'34	h 2'58	h 2'86	l 1'40	h 2'72	h 0'46	h 2'22	h 2'56	h 0'64	h 3'20	C = 58° 51' 2'' 01
				l 3'68			h 1'02				
				l 2'76							
	1'66	2'46	3'62	2'94	2'47	1'66	2'04	2'33	1'34	2'31	M = 2' 28
At LVII											
†May 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
§January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 49'	
† LV & LVI	"	"	"	"	"	"	"	"	"	"	
	h 56'06	h 57'76	l 54'86	l 56'28	l 56'64	l 57'40	h 55'38	l 56'10	l 57'08	l 54'78	
	h 53'90	h 56'30	l 55'80	l 57'52	l 57'68	l 58'24	l 55'72	l 56'08	l 56'30	l 58'02	
	h 57'08	h 54'60	l 55'60	l 56'42	l 56'32	l 56'74	l 56'12	l 56'62	l 57'12	l 58'36	
	h 55'64	h 56'48								l 58'56	
	55'67	56'29	55'42	56'74	56'88	57'46	55'74	56'27	56'83	57'43	M = 56'' 47
Lesser Circle-reading	237° 40'	67° 40'	244° 52'	64° 52'	252° 4'	72° 4'	259° 16'	79° 16'	266° 29'	86° 29'	
§ LV & LVI	h 56'46	h 54'78	l 57'68	l 56'26	l 57'52	l 55'40	l 57'50	l 57'18	l 56'28	l 56'76	
	h 55'68	h 53'70	l 56'14	l 56'52	l 55'72	l 58'02	l 57'08	l 56'12	l 56'46	l 57'92	
	h 55'26	h 54'74	l 58'16	l 56'62	l 56'00	l 57'66	l 56'92	l 55'34	l 56'60	l 58'02	
		l 55'44			l 57'50						
					l 56'60						
	55'80	54'67	57'33	56'47	56'41	57'22	57'17	56'21	56'45	57'57	M = 56'' 53

At LVII—(Continued.)											
† May 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
§ January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	70° 24'	250° 24'	77° 35'	257° 35'	84° 47'	264° 47'	91° 58'	271° 58'	99° 11'	279° 12'	
† LVI & LIX	"	"	"	"	"	"	"	"	"	"	M = 2''69  w = 9'34 $\frac{1}{w}$ = 0'11 C = 51° 57' 2''64  M = 2''61
	h 60° 40'	h 60° 36'	l 63° 14'	l 64° 14'	l 60° 84'	l 61° 88'	h 61° 02'	l 64° 54'	l 65° 86'	l 64° 24'	
h 62° 04'	h 62° 30'	l 62° 88'	l 62° 62'	l 60° 64'	l 63° 30'	l 63° 16'	l 64° 72'	l 63° 84'	l 63° 70'		
h 59° 20'	h 62° 16'	l 62° 14'	l 63° 42'	l 61° 22'	l 63° 32'	l 62° 78'	l 63° 74'	l 64° 02'	l 64° 58'		
h 58° 22'						l 62° 62'					
	59° 97'	61° 61'	62° 72'	63° 39'	60° 90'	62° 83'	62° 40'	64° 33'	64° 57'	64° 17'	
Lesser Circle-reading	306° 3'	128° 3'	315° 15'	135° 15'	322° 27'	142° 27'	329° 39'	149° 35'	336° 52'	156° 52'	
§ LVI & LIX	h 3° 42'	h 4° 16'	d 1° 31'	d 1° 25'	l 0° 56'	l 4° 36'	l 0° 86'	l 4° 24'	l 1° 68'	l 2° 06'	
	h 4° 40'	h 5° 48'	d 0° 89'	d 2° 05'	l 0° 58'	l 2° 86'	l 1° 38'	l 4° 24'	l 3° 26'	l 1° 94'	
	h 3° 32'	h 3° 80'	d 1° 99'	l 3° 12'	l 1° 52'	l 3° 58'	l 1° 38'	l 5° 44'	l 0° 82'	l 3° 08'	
		l 4° 22'	d 2° 39'		l 0° 12'			l 3° 44'			
	3° 71'	4° 42'	1° 65'	2° 14'	0° 70'	3° 60'	1° 21'	4° 34'	1° 92'	2° 36'	
At LVIII											
* May and December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
† January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LXI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 48'	
* LXI & LX	"	"	"	"	"	"	"	"	"	"	M = 51''95
	h 51° 00'	h 51° 34'	h 51° 04'	h 50° 70'	l 50° 52'	l 54° 46'	h 51° 86'	h 52° 78'	l 52° 66'	l 52° 08'	
h 52° 58'	l 50° 98'	l 49° 40'	h 50° 50'	l 51° 92'	l 53° 58'	h 51° 00'	h 53° 18'	l 52° 98'	l 51° 08'		
h 52° 16'	l 51° 48'	l 52° 20'	h 52° 86'	l 51° 16'	l 53° 86'	h 50° 80'	h 54° 12'	l 52° 68'	l 50° 96'		
		l 52° 72'	h 51° 68'		l 52° 50'						
	51° 91'	51° 27'	51° 34'	51° 44'	51° 20'	53° 50'	51° 22'	53° 36'	52° 77'	51° 37'	

At LVIII—(Continued.)											
*May and December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	130°45'	310°45'	137°57'	317°57'	145°9'	305°9'	150°01'	332°21'	159°34'	339°33'	
† LXI & LX	"	"	"	"	"	"	"	"	"	"	w = 21.13 1/w = 0.05 C = 52°11'53".08
	h51.88	h52.08	l57.40	l54.08	l54.96	l54.22	l55.70	l53.48	l53.96	l52.08	
	h54.26	h52.98	l54.12	l53.52	l52.90	l52.44	l55.22	l52.00	l52.74	l56.38	
	h53.96	h53.76	l55.08	l54.00	l54.16	l53.22	l54.06	l54.60	l54.76	l53.60	M = 53".98
			l54.50							l54.72 l56.18 l54.66	
	53.37	53.24	55.28	53.87	54.01	53.29	54.99	53.36	53.82	54.60	
Lesser Circle-reading	52°13'	232°13'	59°24'	239°24'	66°36'	246°36'	73°47'	253°47'	81°0'	261°0'	M = 36".20
* LX & LIX	h36.60	l36.52	h36.00	h37.66	l35.24	l37.06	h34.18	h34.16	l36.16	l36.64	
	h35.48	l37.20	l37.94	h37.70	l37.14	l35.80	h35.88	h36.38	l36.18	l37.44	
	h35.04	l35.64	l36.08	h35.78	l35.72	l36.18	h35.60	h36.30	l35.16	l37.10	M = 35".89
	35.71	36.45	36.67	37.05	36.03	36.35	35.22	35.61	35.83	37.06	
Lesser Circle-reading	182°57'	2°57'	190°9'	10°9'	197°21'	17°21'	204°33'	24°33'	211°45'	31°45'	w = 22.81 1/w = 0.04 C = 60°34'36".12
† LX & LIX	h38.50	h38.28	l34.12	l35.02	l38.78	l36.82	l36.52	l36.40	h34.84	l33.94	
	h36.24	h36.52	l34.56	l35.26	l36.52	l36.04	l33.92	l36.54	h36.42	l33.00	
	h37.24	h36.80	l33.22	l35.14	l37.52	l37.02	l35.56	l35.56	l31.26	l35.84	M = 41".46
			l34.86						l34.74	l36.30	
			l34.76						l34.56	l34.50	
	37.33	37.20	34.30	35.14	37.61	36.63	35.33	36.17	34.39	34.77	
Lesser Circle-reading	0°2'	180°2'	7°12'	187°18'	14°24'	194°24'	21°36'	201°36'	28°46'	208°48'	M = 41".46
* LIX & LVI	h39.52	h40.78	h42.20	h42.42	l41.36	l40.12	l41.12	l42.12	l42.82	l42.98	
	h41.44	h39.60	h40.92	h42.26	l41.56	l42.16	l40.32	l40.60	l40.86	l41.94	
	l41.62	h40.86	h40.62	h41.96	l42.20	l42.80	l40.28	l42.00	l40.56	l42.60	M = 41".46
		h40.94			l42.78						
	40.86	40.55	41.25	42.21	41.71	41.97	40.57	41.57	41.41	42.51	

At LVIII—(Continued.)

\*May and December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	243° 32'	63° 32'	250° 44'	70° 44'	257° 56'	77° 56'	265° 8'	85° 8'	272° 20'	92° 20'	
† LIX & LVI	"	"	"	"	"	"	"	"	"	"	w = 23 '95 I w = 0 '04 C = 57° 30' 41" 59
	h40°40'	h41°10'	l40°62'	l43°46'	l42°88'	l40°28'	l40°64'	l40°40'	h43°70'	l40°72'	
	h41°94'	h43°14'	l42°88'	l43°14'	l42°46'	l43°16'	l41°26'	l42°08'	h41°94'	l40°22'	
	h41°70'	h40°30'	l44°20'	l42°50'	l41°52'	l41°58'	l42°12'	l40°04'	l43°32'	l39°82'	
			l44°66'			l41°18'					
			l43°74'								
			l44°14'								
	41°35'	41°51'	43°37'	43°03'	42°29'	41°55'	41°34'	40°84'	42°99'	40°25'	M = 41" 85
Lesser Circle-reading	57° 32'	237° 32'	64° 43'	244° 43'	71° 55'	251° 55'	79° 6'	259° 7'	86° 19'	266° 19'	
* LVI & LIV	h14°58'	h15°22'	h12°48'	h16°30'	l17°10'	l14°88'	l17°76'	l13°54'	l13°38'	l13°52'	
	h13°64'	h14°80'	h15°80'	h14°32'	l14°82'	l14°00'	l16°28'	l13°70'	h15°40'	l14°70'	
	l14°34'	h13°92'	h14°84'	h16°06'	l13°62'	l15°34'	l17°36'	l14°50'	l13°74'	l15°02'	
		h12°66'	l16°78'		l15°24'						
	14°19'	14°15'	14°98'	15°56'	15°20'	14°74'	17°13'	13°91'	14°17'	14°41'	M = 14" 84
Lesser Circle-reading	301° 2'	121° 2'	306° 15'	128° 15'	315° 26'	135° 26'	322° 38'	142° 38'	329° 50'	149° 50'	
+ LVI & LIV	h13°58'	h14°16'	l16°24'	l14°24'	l11°58'	l15°12'	l13°54'	l14°14'	h14°04'	l14°58'	
	h11°26'	h13°54'	l15°60'	l13°52'	l12°98'	l17°10'	l14°64'	l14°00'	h11°62'	l14°96'	
	h11°50'	h15°32'	l11°74'	l13°98'	l13°16'	l12°96'	l13°32'	l15°10'	l11°54'	l13°44'	
			l11°70'			l13°94'					
			l11°26'			l12°78'					
			l11°44'								
	12°11'	14°34'	13°00'	13°91'	12°57'	14°38'	13°83'	14°41'	12°40'	14°33'	M = 13" 53

At LIX											
*May 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1. †January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
* LVII & LVI	"	"	"	"	"	"	"	"	"	"	
	h 16° 38	h 15° 16	l 16° 06	l 19° 52	l 16° 90	l 18° 08	l 17° 08	l 17° 84	l 20° 16	l 16° 16	
	h 16° 32	h 16° 28	l 17° 44	l 18° 46	l 18° 42	l 18° 76	l 18° 08	l 18° 90	l 19° 38	l 16° 68	
	h 17° 68	h 15° 00	l 16° 44	l 16° 10	l 18° 52	l 18° 98	l 18° 28	l 17° 96	l 17° 76	l 15° 44	
	h 14° 64			l 16° 62					l 18° 68		
	16° 26	15° 48	16° 65	17° 68	17° 95	18° 61	17° 81	18° 23	19° 00	16° 09	M = 17° 38
Lesser Circle-reading	106° 44'	288° 44'	115° 56'	295° 56'	123° 8'	303° 8'	130° 20'	310° 20'	137° 31'	317° 31'	
+ LVII & LVI	h 16° 74	l 19° 82	l 17° 20	h 16° 70	h 18° 34	l 20° 48	l 22° 00	l 19° 10	d 17° 67	l 20° 22	w = 11 '98
	h 15° 84	l 19° 28	l 18° 00	l 19° 32	l 21° 10	l 20° 26	l 19° 44	l 20° 54	d 19° 55	l 18° 78	$\frac{1}{w} = 0 \cdot 08$
	l 16° 28	l 17° 60	l 17° 44	l 17° 12	l 20° 36	l 19° 36	l 18° 70	l 18° 56	d 19° 35	l 20° 52	C = 65° 39' 18" 05
	l 15° 24			l 18° 72	l 19° 14		l 18° 16				
	l 16° 72						l 19° 30				
	16° 16	18° 90	17° 55	17° 97	19° 74	20° 03	19° 52	19° 40	18° 86	19° 84	M = 18° 80
Lesser Circle-reading	65° 40'	245° 41'	72° 52'	252° 52'	80° 4'	260° 4'	87° 15'	267° 15'	94° 28'	274° 28'	
* LVI & LVIII	h 18° 54	h 17° 82	l 20° 76	l 18° 02	l 18° 84	l 17° 94	l 17° 96	l 18° 44	l 15° 48	l 17° 66	
	h 15° 96	h 17° 80	l 20° 90	l 17° 64	l 19° 66	l 17° 48	l 18° 46	l 18° 08	l 14° 32	l 17° 74	
	h 16° 98	h 19° 06	l 19° 74	l 19° 42	l 19° 68	l 17° 64	l 17° 72	l 19° 06	l 16° 36	l 19° 26	
	h 17° 32							l 14° 28			
	17° 20	18° 23	20° 47	18° 36	19° 39	17° 69	18° 05	18° 53	15° 11	18° 22	M = 18° 13
Lesser Circle-reading	174° 23'	354° 23'	181° 35'	1° 36'	188° 47'	8° 48'	195° 59'	15° 59'	208° 11'	23° 11'	
+ LVI & LVIII	h 18° 68	l 15° 92	l 19° 12	h 15° 84	h 16° 76	l 15° 34	l 15° 30	l 17° 44	h 16° 48	d 16° 50	w = 11 '70
	h 18° 88	l 14° 94	l 17° 36	h 16° 70	h 15° 34	l 15° 44	l 16° 90	l 18° 44	h 15° 04	d 16° 62	$\frac{1}{w} = 0 \cdot 09$
	l 19° 04	l 15° 64	l 18° 36	h 17° 76	h 16° 34	l 17° 90	l 16° 74	l 15° 84	l 14° 32	l 13° 70	C = 63° 38' 17" 23
	l 17° 86						l 16° 94	l 15° 38	l 16° 18		
	18° 62	15° 50	18° 28	16° 77	16° 15	16° 23	16° 31	17° 17	15° 31	15° 75	M = 16° 61

At LIX—(Continued.)

\*December 1859, and January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	6° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 49'		
* LVIII & LX	"	"	"	"	"	"	"	"	"	"	h 44° 26' l 42° 10' l 44° 02' h 40° 86' l 42° 34' l 43° 28' h 41° 36' h 42° 94' l 43° 52' l 40° 74' h 43° 94' l 42° 56' h 42° 32' l 42° 18' l 42° 00' l 44° 22' h 41° 60' h 42° 54' l 43° 50' l 42° 06' h 43° 88' l 43° 28' h 41° 30' l 44° 64' l 43° 00' l 44° 46' h 42° 38' h 42° 60' l 41° 50' l 41° 48' h 41° 96' l 42° 46' h 43° 00' l 43° 08'	M = 42° 66'
Lesser Circle-reading	238° 1'	58° 2'	245° 14'	65° 14'	252° 26'	72° 28'	259° 38'	79° 38'	266° 49'	86° 49'		
† LVIII & LX	d 42° 38' l 43° 64' l 41° 86' h 43° 66' h 44° 32' l 44° 24' l 42° 20' l 39° 14' h 44° 08' l 43° 20' h 41° 68' l 42° 68' l 42° 44' h 43° 30' h 43° 56' l 44° 02' l 43° 30' l 39° 98' l 43° 40' l 44° 68' h 43° 42' l 43° 76' l 40° 80' h 44° 76' h 42° 74' l 41° 10' l 43° 80' l 41° 72' l 42° 16' l 44° 22' l 42° 58' l 42° 08' l 42° 94' l 43° 64' l 45° 90' l 43° 26' l 44° 54' l 43° 30'	w = 23° 74' I = 0° 04' C = 66° 11' 42" 85										
Lesser Circle-reading	42° 52'	43° 36'	41° 80'	43° 91'	43° 54'	43° 08'	43° 10'	41° 84'	44° 02'	44° 03'	M = 43° 12'	
Lesser Circle-reading	66° 13'	246° 13'	73° 24'	253° 24'	80° 36'	260° 36'	87° 47'	267° 47'	95° 0'	275° 0'		
• LX & LXII	h 22° 18' l 25° 24' l 25° 24' l 27° 10' l 25° 04' l 26° 24' h 25° 44' h 26° 46' l 25° 16' l 27° 88' h 22° 16' l 24° 60' h 24° 54' l 23° 82' l 25° 60' l 27° 84' h 25° 04' h 27° 80' l 25° 94' l 27° 08' h 24° 36' l 25° 22' h 25° 18' l 27° 12' l 25° 60' l 25° 14' h 27° 18' h 28° 40' l 25° 80' l 28° 28' l 24° 44' l 25° 20' l 26° 44'	M = 25° 72'										
Lesser Circle-reading	22° 90'	24° 88'	24° 99'	25° 81'	25° 41'	26° 42'	25° 89'	27° 55'	25° 63'	27° 75'		
Lesser Circle-reading	304° 13'	124° 13'	311° 25'	131° 26'	318° 37'	138° 37'	325° 49'	145° 49'	333° 1'	153° 1'	w = 9° 99' I = 0° 10' C = 55° 47' 25" 00	
† LX & LXII	d 25° 52' l 20° 18' l 23° 60' h 21° 02' h 24° 82' l 22° 82' l 24° 08' l 26° 56' l 24° 50' l 23° 90' l 26° 96' l 22° 94' l 24° 24' h 20° 62' h 25° 58' l 24° 20' l 21° 66' l 26° 84' l 23° 54' l 25° 40' l 25° 46' l 23° 06' l 26° 06' l 22° 14' h 25° 52' l 23° 36' l 21° 14' l 26° 32' l 26° 56' l 24° 12' l 24° 68' l 25° 54' l 23° 12' l 24° 22' l 25° 84' l 25° 00' l 23° 88' l 25° 56' l 24° 26' l 24° 06' l 23° 04'	M = 24° 38'										
Lesser Circle-reading	25° 66'	23° 28'	24° 63'	22° 58'	25° 31'	23° 46'	23° 07'	26° 39'	24° 90'	24° 47'		

At LX

\* December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite  
No. 1.

† December 1860, and January 1861, observed by Lieutenants J. Herschel and H. R. Thauillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on LXI										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 1'	180° 2'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 48'		
* LXI & LXIII	"	"	"	"	"	"	"	"	"	"		
	h 56° 74	l 57° 44	l 61° 90	h 57° 66	l 58° 52	h 57° 24	l 59° 78	h 59° 20	h 59° 14	l 58° 46		
	h 58° 84	l 59° 10	l 58° 42	h 59° 74	l 57° 80	l 58° 12	l 57° 64	h 58° 74	l 60° 72	l 57° 62		
	h 59° 20	l 59° 42	l 57° 58	l 58° 00	l 58° 60	l 59° 14	l 58° 82	l 60° 08	l 57° 66	l 58° 72		
	l 59° 08		l 57° 46						l 59° 34			
	58° 47	58° 65	58° 84	58° 47	58° 31	58° 17	58° 75	59° 34	59° 22	58° 27		M = 58'' 65
Lesser Circle-reading	326° 1'	146° 1'	333° 14'	153° 14'	340° 27'	160° 27'	347° 39'	167° 38'	354° 50'	174° 50'		
† LXI & LXIII	h 60° 26	h 59° 14	l 57° 14	l 61° 84	h 59° 22	l 57° 64	l 62° 40	h 60° 50	h 60° 38	l 61° 52		w = 31.19
	h 59° 16	h 58° 70	l 58° 02	h 60° 98	h 59° 08	l 60° 08	l 62° 36	h 61° 10	l 61° 82	l 60° 64		$\frac{1}{w} = 0.03$
	h 59° 86	l 61° 00	l 60° 30	h 57° 24	l 61° 96	l 58° 80	h 57° 04	h 59° 04	l 60° 62	l 62° 14		C = 73° 57' 59'' 10
			l 63° 40	h 58° 78	l 61° 10	l 59° 66	h 59° 60					
			h 59° 74	h 58° 80			h 58° 80					
			h 61° 18	h 59° 46			h 59° 38					
	59° 76	59° 61	59° 96	59° 52	60° 34	59° 05	59° 93	60° 21	60° 94	61° 43		M = 60'' 08
Lesser Circle-reading	73° 59'	254° 0'	81° 10'	261° 11'	88° 22'	268° 23'	95° 33'	275° 34'	102° 46'	282° 46'		
* LXIII & LXIV	h 18° 78	l 17° 92	l 13° 84	h 18° 84	l 17° 92	h 19° 10	l 16° 46	h 19° 86	h 19° 50	l 21° 14		M = 18'' 43
	h 15° 80	l 18° 56	l 18° 80	h 19° 28	l 18° 22	l 19° 48	l 16° 88	h 20° 36	l 18° 16	l 21° 50		w = .3 84
	h 17° 06	l 17° 52	l 15° 96	l 16° 26	l 17° 62	l 19° 76	l 17° 66	l 19° 36	l 21° 44	l 21° 48		$\frac{1}{w} = 0.26$
	l 16° 90		l 16° 78	l 17° 66					l 17° 78			C = 48° 57' 18'' 42
	17° 14	18° 00	16° 35	18° 01	17° 92	19° 45	17° 00	19° 86	19° 22	21° 37		

At LX—(Continued.)

\*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†December 1860, and January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	46° 1'	226° 1'	47° 12'	227° 12'	54° 25'	231° 25'	61° 37'	241° 36'	68° 48'	248° 48'	
† LXIII & LXV	"	"	"	"	"	"	"	"	"	"	M = 58"·66 w = 5·61 $\frac{1}{w}$ = 0·18 C = 51° 7' 58"·70
	d61·33	d59·49	d61·35	d58·30	h61·62	l58·36	l59·46	h58·64	l57·78	l58·64	
	d61·77	d54·65	d60·43	h58·28	l54·52	l59·74	l60·06	h59·22	l57·98	l56·88	
	d60·75	d57·91	d55·19	h58·64	l52·26	l60·92	h61·10	h59·44	l57·28	l58·30	
	l57·70	d57·51	h58·80		l56·82	l61·06	h60·48	h58·42	d57·25		
	l59·54	l58·26	h58·88		l58·12	h59·64	h62·74				
	l60·54	l57·66	h58·20		l57·44	h58·24	h60·62				
	l59·92	l57·76			l58·52		h58·80				
							h60·38				
							h60·28				
	60·22	57·61	58·81	58·41	57·04	59·66	60·44	58·93	57·57	57·94	
Lesser Circle-reading	122° 57'	302° 57'	130° 7'	316° 8'	137° 20'	317° 20'	144° 31'	324° 31'	151° 44'	331° 44'	
* LXIV & LXII	h 6·38	l 4·38	l 6·32	h 4·86	l 6·54	h 5·28	l 3·64	h 3·78	h 4·38	l 4·78	M = 4"·55 w = 10·88 $\frac{1}{w}$ = 0·09 C = 56° 35' 4"·55
	h 6·12	l 3·56	l 4·86	h 3·44	l 5·34	l 5·36	l 5·04	h 2·92	l 3·90	l 3·06	
	h 5·70	l 3·60	l 5·42	l 5·62	l 4·52	l 4·44	l 3·80	l 4·00	l 2·20	l 3·46	
			l 4·50						l 3·96		
	6·07	3·85	5·28	4·64	5·47	5·03	4·16	3·57	3·61	3·77	
Lesser Circle-reading	91° 9'	271° 9'	98° 20'	278° 20'	105° 33'	285° 33'	112° 45°	292° 44'	119° 56'	299° 56'	
† LXV & LXII	d23·97	d25·95	d25·97	h22·02	h22·26	l25·74	l20·16	h20·82	l22·84	l21·08	M = 23"·01 w = 8·52 $\frac{1}{w}$ = 0·12 C = 54° 24' 23"·06
	d24·41	d21·11	d25·05	h22·48	h23·14	l25·16	l23·00	h24·00	l22·36	l22·22	
	d23·39	d24·37	d19·81	h22·52	l25·82	l20·18	h21·14	h23·38	l23·66	l22·40	
	l24·16	d23·97	h23·66		l24·42	l23·94	h21·18	h24·34	d22·52		
	l20·82	l23·46	h22·84		l23·62	h25·02	h22·64	h22·36			
	l21·02	l24·26	h23·26			h25·04					
	l22·26	l25·34									
	22·86	24·07	23·43	22·34	23·85	24·18	21·62	22·98	22·85	21·90	



At LX—(Continued.)

\*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†December 1860, and January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	179°32'	359°32'	186°43'	6°43'	193°55'	18°55'	201°6'	21°6'	208°19'	28°19'	
* LXII & LIX	"	"	"	"	"	"	"	"	"	"	
	<i>h</i> 38°36'	<i>l</i> 41°08'	<i>l</i> 39°06'	<i>h</i> 39°66'	<i>l</i> 40°86'	<i>h</i> 40°46'	<i>l</i> 37°92'	<i>h</i> 40°84'	<i>h</i> 40°60'	<i>l</i> 38°72'	
	<i>h</i> 39°94'	<i>l</i> 39°22'	<i>l</i> 41°18'	<i>h</i> 41°46'	<i>l</i> 41°32'	<i>l</i> 39°70'	<i>l</i> 38°76'	<i>h</i> 41°08'	<i>l</i> 41°94'	<i>l</i> 38°20'	
	<i>h</i> 39°82'	<i>l</i> 40°30'	<i>l</i> 42°50'	<i>l</i> 40°14'	<i>l</i> 41°24'	<i>l</i> 40°28'	<i>l</i> 39°16'	<i>l</i> 39°32'	<i>l</i> 38°56'	<i>l</i> 39°06'	
			<i>l</i> 41°38'						<i>l</i> 40°50'		
	39°37'	40°20'	41°26'	40°42'	41°14'	40°15'	38°61'	40°41'	40°40'	38°96'	M = 40"·09
Lesser Circle-reading	145°31'	325°31'	152°45'	332°45'	159°57'	339°57'	167°9'	347°8'	174°21'	354°21'	
† LXII & LIX	<i>h</i> 42°50'	<i>h</i> 43°44'	<i>l</i> 41°74'	<i>l</i> 41°38'	<i>h</i> 40°98'	<i>l</i> 38°00'	<i>l</i> 41°86'	<i>h</i> 44°58'	<i>h</i> 41°40'	<i>l</i> 40°92'	w = 16·48
	<i>h</i> 42°34'	<i>l</i> 41°36'	<i>l</i> 41°84'	<i>h</i> 42°46'	<i>h</i> 40°76'	<i>l</i> 37°82'	<i>l</i> 41°54'	<i>h</i> 41°78'	<i>l</i> 42°54'	<i>l</i> 38°80'	$\frac{1}{w} = 0·06$
	<i>h</i> 41°96'	<i>l</i> 40°32'	<i>l</i> 42°76'	<i>h</i> 41°34'	<i>l</i> 40°22'	<i>l</i> 40°70'	<i>h</i> 39°30'	<i>h</i> 40°92'	<i>l</i> 39°80'	<i>l</i> 39°02'	C = 67° 9' 40"·46
		<i>l</i> 43°50'				<i>l</i> 37°74'		<i>h</i> 41°34'	<i>l</i> 41°28'		
						<i>h</i> 38°26'		<i>h</i> 40°74'			
						<i>h</i> 39°82'					
	42°27'	42°16'	42°11'	41°73'	40°65'	38°72'	40°90'	41°87'	41°26'	39°58'	M = 41"·13
Lesser Circle-reading	246°42'	66°42'	253°52'	73°53'	261°4'	81°5'	266°15'	86°16'	275°28'	95°28'	
* LIX & LVIII	<i>h</i> 41°40'	<i>l</i> 41°12'	<i>l</i> 42°92'	<i>h</i> 39°68'	<i>l</i> 40°36'	<i>h</i> 40°80'	<i>l</i> 43°72'	<i>h</i> 40°80'	<i>h</i> 39°56'	<i>l</i> 40°52'	
	<i>h</i> 40°52'	<i>l</i> 42°40'	<i>l</i> 39°96'	<i>h</i> 37°70'	<i>l</i> 42°36'	<i>l</i> 39°84'	<i>l</i> 43°08'	<i>h</i> 40°28'	<i>h</i> 42°68'	<i>l</i> 41°62'	
	<i>h</i> 41°74'	<i>l</i> 42°14'	<i>l</i> 40°58'	<i>l</i> 40°12'	<i>l</i> 42°48'	<i>l</i> 39°66'	<i>l</i> 43°68'	<i>l</i> 40°14'	<i>l</i> 38°06'	<i>l</i> 41°02'	
		<i>l</i> 42°46'	<i>l</i> 42°44'					<i>l</i> 41°46'			
								<i>l</i> 41°44'			
	41°22'	41°89'	41°48'	39°99'	41°73'	40°10'	43°49'	40°41'	40°64'	41°05'	M = 41"·20

At LX—(Continued.)											
*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†December 1860, and January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	212° 41'	32° 41'	215° 54'	39° 54'	227° 7'	47° 7'	234° 19'	54° 18'	241° 30'	61° 30'	
† LIX & LVIII	"	"	"	"	"	"	"	"	"	"	<i>w</i> = 12.88 $\frac{1}{w}$ = 0.08 <i>C</i> = 53° 13' 41".14
	h40°24	h39°70	l39°82	l40°86	h39°22	l40°10	l40°24	h39°74	h42°54	l42°18	
	h39°48	h40°24	l40°14	h40°90	h39°34	l40°42	l43°28	h41°24	l41°24	l42°98	<i>M</i> = 41".06
	h40°16	l40°92	l38°96	h40°20	l40°70	l43°70	h42°06	h41°26	l43°22	l43°56	
						l42°52	h43°60		l42°58	l43°06	
						h42°66					
						h41°82					
	39°96	40°29	39°64	40°65	39°75	41°87	42°30	40°75	42°40	42°95	
Lesser Circle-reading	299° 55'	115° 55'	307° 6'	127° 6'	314° 18'	134° 18'	321° 29'	141° 29'	328° 42'	146° 42'	
* LVIII & LXI	h18°42	l17°40	l15°34	h18°10	l16°06	h16°30	l17°68	h16°62	h17°48	l16°70	<i>w</i> = 21.25 $\frac{1}{w}$ = 0.05 <i>C</i> = 60° 6' 16".14
	h18°40	l16°38	l17°60	h18°62	l14°54	l16°82	l17°40	h16°44	h14°44	l17°44	
	h16°20	l17°04	l18°18	l18°40	l14°72	l15°86	l15°60	l16°14	l16°56	l15°78	<i>M</i> = 16".80
			l17°92						l17°68	l15°70	
	17°67	16°94	17°26	18°37	15°11	16°33	16°89	16°40	16°37	16°64	
Lesser Circle-reading	285° 55'	85° 55'	273° 8'	98° 8'	280° 20'	100° 20'	287° 32'	107° 31'	294° 44'	114° 44'	
† LVIII & LXI	h14°12	h14°24	l16°46	l15°58	h15°96	l17°38	l16°04	h15°00	h15°42	l15°10	<i>w</i> = 21.25 $\frac{1}{w}$ = 0.05 <i>C</i> = 60° 6' 16".14
	h13°80	h15°14	l17°22	h14°64	h15°90	l17°54	l14°36	h14°92	l14°44	l16°44	
	h15°24	l15°00	l16°52	h15°06	l16°50	l15°84	h17°44	h16°26	l15°00	l13°64	<i>M</i> = 15".55
				h15°34		l17°42	h13°52			l16°34	
							h16°18				
	14°39	14°79	16°73	15°16	16°12	17°05	15°51	15°39	14°95	15°38	

At LXI											
* December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
† December 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
* LXIII & LX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 52''·72
	h 51'92	h 54'84	l 50'80	l 54'46	l 51'88	l 54'82	l 53'04	l 49'86	l 53'18	l 53'68	
	h 53'14	h 52'30	l 51'08	l 53'82	l 53'40	l 52'70	l 52'76	l 50'46	l 55'08	h 54'82	
	h 52'72	h 52'96	l 51'86	l 51'80	l 51'56	l 54'60	l 51'68	l 51'08	l 51'74	h 53'98	
		h 53'86		l 51'90					l 52'52	h 55'30	
	52'59	53'49	51'25	53'00	52'28	54'04	52'49	50'47	53'13	54'45	<i>M</i> = 52''·72
Lesser Circle-reading	296° 17'	56° 17'	243° 30'	63° 30'	250° 42'	70° 42'	257° 55'	77° 55'	265° 6'	85° 6'	<i>w</i> = 22 ·08
† LXIII & LX	l 54'16	l 54'00	l 55'94	l 55'04	h 55'04	h 54'76	h 54'06	l 56'46	l 55'30	l 52'54	<i>i</i> / <i>w</i> = 0 ·05 <i>C</i> = 56° 0' 54''·23
	l 55'28	l 56'42	l 54'92	l 54'60	h 54'04	h 54'18	h 53'74	l 55'28	l 54'96	l 54'34	
	l 54'88	l 55'02	l 55'88	l 56'22	h 54'84	h 54'66	l 54'66	l 55'42	l 54'00	l 53'10	
	54'77	55'15	55'58	55'29	54'64	54'53	54'15	55'72	54'75	53'33	<i>M</i> = 54''·79
Lesser Circle-reading	56° 2'	236° 2'	63° 18'	243° 18'	70° 25'	250° 25'	77° 36'	257° 37'	84° 49'	264° 49'	
* LX & LVIII	h 50'40	h 51'10	l 51'44	l 50'30	l 50'32	l 51'64	l 51'32	l 52'78	l 50'92	l 51'88	<i>M</i> = 51''·39
	h 51'86	h 52'34	l 50'18	l 50'08	l 49'12	l 50'50	l 53'54	l 52'72	l 50'44	h 51'36	
	h 51'50	h 52'36	l 49'98	l 51'82	l 51'74	l 50'84	l 51'80	l 52'60	l 51'94	h 52'80	
			l 50'78	l 51'04				l 50'90	h 51'46		
	51'25	51'93	50'53	50'75	50'56	50'99	52'22	52'70	51'05	51'88	
Lesser Circle-reading	292° 19'	112° 19'	299° 31'	119° 31'	306° 48'	126° 48'	318° 58'	133° 58'	321° 7'	141° 7'	<i>w</i> = 28 ·32
† LX & LVIII	h 52'72	h 51'90	h 50'06	h 52'10	h 51'08	h 51'46	h 52'56	l 51'60	l 49'52	l 50'80	<i>i</i> / <i>w</i> = 0 ·04 <i>C</i> = 67° 41' 51''·38
	h 50'88	h 52'92	h 50'84	h 53'06	h 52'18	h 50'38	h 50'98	l 52'10	l 50'12	l 49'94	
	h 53'14	h 51'88	h 50'86	h 51'76	h 50'84	h 51'56	h 51'00	l 51'68	l 51'04	l 50'64	
	52'25	52'23	50'59	52'31	51'37	51'13	51'51	51'79	50'23	50'46	<i>M</i> = 51''·39

At LXII											
*January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	26° 48'	206° 48'	
* LIX & LX	"	"	"	"	"	"	"	"	"	"	M = 54° 87  w = 13.80 $\frac{1}{w} = 0.07$ C = 57° 2' 55".09  M = 55° 30
	h 52° 86	h 52° 48	l 55° 28	l 54° 12	l 56° 10	l 55° 12	l 55° 12	l 52° 64	h 56° 52	l 53° 46	
	h 53° 02	l 52° 52	l 54° 50	l 55° 50	l 55° 54	h 56° 54	l 55° 86	l 55° 48	h 56° 90	l 57° 04	
h 54° 40	l 53° 40	l 55° 76	l 54° 42	l 56° 00	l 56° 08	l 54° 66	l 54° 20	h 55° 82	l 55° 94		
							l 53° 64		l 54° 40		
	53° 43	52° 80	55° 18	54° 68	55° 88	55° 91	55° 21	53° 99	56° 41	55° 21	
Lesser Circle-reading	224° 49'	44° 45'	232° 1'	52° 1'	235° 13'	55° 13'	246° 25'	66° 25'	258° 37'	73° 37'	
† LIX & LX	l 56° 88	l 54° 18	l 56° 60	l 55° 68	l 55° 38	l 54° 58	h 54° 84	h 52° 28	l 57° 00	l 55° 68	
	l 56° 80	l 56° 64	l 54° 30	l 55° 80	l 53° 46	l 53° 88	h 54° 24	h 52° 56	l 54° 90	l 56° 02	
	l 55° 78	l 57° 64	l 56° 24	l 54° 82	l 55° 38	l 51° 54	h 55° 46	h 54° 16	l 57° 14	l 55° 98	
	l 56° 30				l 55° 46	l 54° 68	l 54° 10				
	56° 49	56° 19	55° 71	55° 43	54° 74	54° 03	54° 85	53° 28	56° 35	55° 89	
Lesser Circle-reading	57° 4'	237° 4'	64° 15'	244° 15'	71° 27'	251° 27'	76° 36'	258° 38'	85° 51'	265° 51'	
* LX & LXIV	h 58° 56	h 59° 06	l 56° 46	l 58° 50	l 57° 76	l 59° 40	l 55° 56	l 59° 82	l 58° 22	l 55° 54	
	h 57° 38	l 59° 10	l 57° 34	l 57° 56	l 58° 92	h 54° 34	l 58° 00	l 59° 60	l 57° 86	l 55° 88	
	h 56° 38	l 58° 22	l 56° 44	l 58° 76	l 58° 92	h 56° 30	l 58° 36	l 58° 78	l 58° 12	l 57° 22	
					h 55° 66				l 59° 50		
	57° 44	58° 79	56° 75	58° 27	58° 53	56° 43	57° 31	59° 40	58° 07	57° 04	
Lesser Circle-reading	281° 52'	101° 52'	289° 4'	105° 4'	296° 16'	116° 16'	303° 28'	123° 28'	310° 40'	130° 40'	
† LX & LXV	h 41° 42	l 39° 64	l 39° 40	l 38° 00	l 36° 14	l 36° 14	h 37° 40	h 40° 98	h 39° 20	l 44° 14	
	h 40° 90	l 37° 74	l 39° 70	l 38° 56	l 38° 42	l 38° 42	h 39° 40	h 40° 84	l 43° 02	l 39° 92	
	l 36° 06	l 38° 78	l 38° 18	l 37° 56	l 36° 66	l 40° 36	h 41° 60	h 41° 60	l 43° 98	l 40° 30	
l 38° 86				l 39° 30	l 40° 76	h 38° 56		l 41° 60	l 38° 56		
l 37° 66				l 40° 84	l 38° 98	h 39° 20		l 42° 20	l 36° 88		
l 38° 26				l 38° 04				l 39° 62	l 37° 14		
								l 40° 68	l 37° 22		
	38° 86	38° 72	39° 09	38° 04	38° 23	38° 93	39° 23	41° 14	41° 47	39° 17	

At LXIII											
*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†December 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	15° 48'	195° 48'	22° 59'	202° 59'	30° 11'	210° 11'	37° 22'	217° 22'	44° 35'	224° 35'	
* LXVII & LXVI	"	"	"	"	"	"	"	"	"	"	M = 43'' 37 w = 8 40 $\frac{1}{w}$ = 0 12 C = 54° 36' 43'' 37
	h 43' 94	l 41' 16	l 42' 46	l 43' 30	l 44' 52	h 43' 56	h 44' 34	h 42' 64	l 42' 06	l 43' 88	
	h 45' 60	l 40' 62	h 43' 26	l 44' 88	l 44' 40	h 43' 06	h 44' 02	h 42' 30	l 43' 04	l 44' 34	
	h 45' 14	l 41' 32	l 43' 72	l 42' 86	l 43' 98	h 42' 58	h 43' 44	h 43' 92	l 44' 00	l 42' 84	
	44' 89	41' 03	43' 15	43' 68	44' 30	43' 07	43' 93	42' 95	43' 03	43' 69	
* LXVI & LXIV	h 2' 78	l 4' 22	l 4' 60	l 5' 20	l 4' 40	h 3' 32	h 4' 48	h 5' 06	l 3' 82	h 3' 14	M = 4'' 19 w = 13 54 $\frac{1}{w}$ = 0 07 C = 71° 13' 4'' 19
	h 2' 38	l 5' 36	h 1' 68	l 4' 38	l 4' 18	l 2' 66	h 2' 90	h 4' 12	l 3' 68	h 6' 14	
	h 3' 04	l 5' 40	l 4' 54	l 4' 88	l 5' 00	l 4' 40	h 3' 48	h 5' 02	l 5' 16	h 4' 40	
		l 4' 54						l 4' 32	l 5' 84		
	2' 73	4' 99	3' 84	4' 82	4' 53	3' 46	3' 62	4' 73	4' 25	4' 88	
Lesser Circle-reading	154° 6'	384° 6'	161° 18'	341° 18'	168° 31'	348° 30'	175° 42'	355° 42'	182° 54'	2° 54'	
† LXVI & LXV	h 53' 10	l 52' 08	l 57' 30	h 53' 84	h 54' 86	h 53' 58	h 52' 14	h 53' 14	l 55' 06	l 51' 60	M = 52'' 98 w = 9 46 $\frac{1}{w}$ = 0 11 C = 74° 12' 53'' 01
	h 51' 74	l 52' 54	l 56' 50	h 52' 80	h 54' 16	h 52' 24	h 53' 32	l 53' 74	l 56' 16	l 52' 80	
	h 53' 42	l 52' 18	l 52' 52	h 52' 64	h 52' 96	h 52' 54	h 53' 66	l 51' 86	l 52' 12	l 52' 82	
		h 48' 82						l 55' 20			
		h 49' 18						h 51' 38			
		h 52' 20						h 51' 36			
	52' 75	52' 27	52' 81	53' 09	53' 99	52' 79	53' 04	52' 91	53' 70	52' 41	
Lesser Circle-reading	141° 38'	321° 38'	148° 49'	328° 49'	156° 1'	336° 1'	163° 12'	343° 12'	170° 25'	350° 25'	
* LXIV & LX	h 14' 90	l 8' 62	l 13' 68	l 14' 32	l 12' 08	h 14' 66	h 14' 02	h 16' 06	l 18' 14	h 13' 96	M = 14'' 52 w = 3 86 $\frac{1}{w}$ = 0 26 C = 84° 40' 14'' 51
	h 12' 20	l 12' 84	h 15' 72	l 14' 04	l 12' 34	l 15' 90	h 14' 16	h 17' 78	l 17' 58	h 14' 06	
	h 13' 50	l 13' 22	l 14' 02	l 15' 08	l 13' 24	l 15' 02	h 14' 94	h 17' 78	l 14' 70	h 15' 22	
	l 14' 28	l 15' 58						l 14' 28			
	13' 72	12' 57	14' 47	14' 48	12' 55	15' 19	14' 37	17' 21	16' 18	14' 41	

At LXV

December 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on LXII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	174° 8'	354° 4'	181° 15'	361° 15'	188° 28'	8° 28'	195° 40'	15° 40'	202° 51'	22° 52'	
LXII & LX	d 57° 67	l 56° 38	h 55° 42	l 57° 06	l 57° 28	l 59° 02	l 60° 52	l 59° 28	l 54° 94	l 56° 18	M = 58" 80 w = 4.27 $\frac{1}{w}$ = 0.23 C = 47° 26' 58" 78
	l 57° 78	l 59° 18	h 56° 40	l 59° 50	l 56° 64	l 57° 48	d 60° 63	l 57° 64	l 56° 92	l 55° 30	
	h 62° 46	l 59° 56	l 60° 64	l 58° 52	h 61° 86	h 61° 96	l 60° 16	l 59° 08	l 59° 86	h 54° 86	
	h 60° 82	l 59° 68	l 58° 86		h 61° 54	h 62° 20			l 58° 76	h 56° 94	
	h 61° 50				h 60° 88	h 62° 30			l 56° 42	h 58° 20	
	l 57° 60									h 58° 74	
	59° 64	58° 70	57° 83	58° 36	59° 64	60° 59	60° 44	58° 67	57° 38	56° 70	
LX & LXIII	d 34° 87	l 37° 78	l 36° 44	h 37° 98	l 38° 10	l 35° 48	l 35° 60	l 37° 36	l 36° 22	l 37° 64	M = 37" 08 w = 16.54 $\frac{1}{w}$ = 0.06 C = 47° 11' 37" 07
	l 37° 08	l 38° 32	h 35° 32	h 37° 06	l 38° 06	l 37° 24	l 36° 40	l 37° 88	l 36° 26	l 37° 54	
	h 35° 36	l 36° 90	h 35° 72	l 36° 44	h 37° 14	h 38° 42	l 36° 62	l 37° 34	l 34° 80	h 36° 34	
	h 37° 58		h 38° 26			h 38° 62			l 37° 80	h 38° 46	
	h 37° 76										
	h 38° 38										
	36° 84	37° 67	36° 44	37° 16	37° 77	37° 44	36° 21	37° 53	36° 27	37° 50	
LXIII & LXVI	h 41° 62	l 42° 16	l 40° 02	h 43° 78	l 41° 62	l 42° 28	d 43° 69	h 41° 58	h 41° 94	h 43° 50	M = 41" 74 w = 13.23 $\frac{1}{w}$ = 0.08 C = 49° 7' 41" 74
	l 44° 32	l 42° 62	h 39° 40	h 43° 48	l 40° 96	l 39° 84	d 42° 75	h 40° 60	h 40° 50	h 43° 00	
	l 42° 84	l 42° 74	h 41° 10	h 40° 88	h 43° 34	h 41° 04	h 40° 36	h 40° 58	h 41° 30	h 41° 82	
	l 41° 66		h 42° 70	h 41° 30			h 39° 80				
	h 41° 74		h 41° 74	l 41° 36			h 39° 94				
	h 41° 36		h 43° 04				h 40° 62				
	42° 26	42° 51	41° 33	42° 16	41° 97	41° 05	41° 19	40° 92	41° 25	42° 77	
LXVI & LXVIII	l 57° 42	l 59° 00	h 53° 20	h 60° 28	l 59° 64	l 60° 86	h 59° 36	d 57° 46	d 57° 71	h 58° 86	M = 59" 44 w = 7.29 $\frac{1}{w}$ = 0.14 C = 42° 10' 59" 44
	l 61° 02	l 57° 30	h 54° 80	h 59° 86	l 59° 86	l 60° 40	h 57° 92	d 59° 64	d 56° 85	h 58° 66	
	h 58° 30	l 58° 32	h 62° 50	h 59° 30	h 60° 58	h 62° 72	d 62° 66	d 60° 24	d 58° 33	h 60° 02	
	h 56° 54		h 61° 16			l 58° 70	d 61° 72	l 61° 72	h 61° 50		
	h 58° 46		h 60° 32			l 59° 88	h 60° 18	l 60° 90	h 58° 88		
	h 59° 96		l 60° 82								
			l 60° 70								
	58° 62	58° 21	59° 07	59° 81	60° 03	60° 51	60° 37	59° 99	58° 65	59° 18	



At LX—(Continued.)											
*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†December 1860, and January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	40° 1'	220° 1'	47° 12'	227° 12'	54° 25'	234° 25'	61° 37'	241° 36'	68° 48'	248° 48'	
+ LXIII & LXV	d61°33	d59°49	d61°35	d58°30	h61°62	l58°36	l59°46	h58°64	l57°78	l58°64	M = 58°-66 w = 5·61 1/w = 0·18 C = 51° 7' 58"-70
	d61°77	d54°65	d60°43	h58°28	l54°52	l59°74	l60°06	h59°22	l57°98	l56°88	
d60°75	d57°91	d55°19	h58°64	l52°26	l60°92	h61°10	h59°44	l57°28	l58°30		
l57°70	d57°51	h58°80		l56°82	l61°06	h60°48	h58°42	d57°25			
l59°54	l58°26	h58°88		l58°12	h59°64	h62°74					
l60°54	l57°66	h58°20		l57°44	h58°24	h60°62					
l59°92	l57°76			l58°52		h58°80					
						h60°38					
						h60°28					
	60°22	57°61	58°81	58°41	57°04	59°66	60°44	58°93	57°57	57°94	
Lesser Circle-reading	122° 57'	302° 57'	130° 7'	310° 8'	137° 20'	317° 20'	144° 31'	324° 31'	151° 44'	331° 44'	M = 4"-55 w = 10·88 1/w = 0·09 C = 56° 35' 4"-55
* LXIV & LXII	h 6°38	l 4°38	l 6°32	h 4°86	l 6°54	h 5°28	l 3°64	h 3°78	h 4°38	l 4°78	
	h 6°12	l 3°56	l 4°86	h 3°44	l 5°34	l 5°36	l 5°04	h 2°92	l 3°90	l 3°06	
	h 5°70	l 3°60	l 5°42	l 5°62	l 4°52	l 4°44	l 3°80	l 4°00	l 2°20	l 3°46	
			l 4°50						l 3°96		
	6°07	3°85	5°28	4°64	5°47	5°03	4°16	3°57	3°61	3°77	
Lesser Circle-reading	91° 9'	271° 9'	98° 20'	278° 20'	105° 33'	285° 33'	112° 45'	292° 44'	119° 56'	299° 56'	M = 23"-01 w = 8·52 1/w = 0·12 C = 54° 24' 23"-06
+ LXV & LXII	d23°97	d25°95	d25°97	h22°02	h22°26	l25°74	l20°16	h20°82	l22°84	l21°08	
	d24°41	d21°11	d25°05	h22°48	h23°14	l25°16	l23°00	h24°00	l22°36	l22°22	
	d23°39	d24°37	d19°81	h22°52	l25°82	l20°18	h21°14	h23°38	l23°66	l22°40	
	l24°16	d23°97	h23°66		l24°42	l23°94	h21°18	h24°34	d22°52		
l20°82	l23°46	h22°84		l23°62	h25°02	h22°64	h22°36				
l21°02	l24°26	h23°26			h25°04						
l22°26	l25°34										
	22°86	24°07	23°43	22°34	23°85	24°18	21°62	22°98	22°85	21°90	



At LX—(Continued.)

\*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†December 1860, and January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	179°32'	359°32'	186°43'	6°43'	193°55'	18°55'	201°6'	21°6'	206°19'	28°19'	
* LXII & LIX	"	"	"	"	"	"	"	"	"	"	
	h38°36'	l41°08'	l39°96'	h39°66'	l40°86'	h40°46'	l37°92'	h40°84'	h40°60'	l38°72'	
	h39°94'	l39°22'	l41°18'	h41°46'	l41°32'	l39°70'	l38°76'	h41°08'	l41°94'	l38°20'	
	h39°82'	l40°30'	l42°50'	l40°14'	l41°24'	l40°28'	l39°16'	l39°32'	l38°56'	l39°96'	
			l41°38'						l40°50'		
	39°37'	40°20'	41°26'	40°42'	41°14'	40°15'	38°61'	40°41'	40°40'	38°96'	M = 40°09'
Lesser Circle-reading	145°31'	325°31'	152°45'	332°45'	159°57'	339°57'	167°9'	347°8'	174°21'	354°21'	
† LXII & LIX	h42°50'	h43°44'	l41°74'	l41°38'	h40°98'	l38°00'	l41°86'	h44°58'	h41°40'	l40°92'	w = 16.48
	h42°34'	l41°36'	l41°84'	h42°46'	h40°76'	l37°82'	l41°54'	h41°78'	l42°54'	l38°80'	$\frac{1}{w} = 0.06$
	h41°96'	l40°32'	l42°76'	h41°34'	l40°22'	l40°70'	h39°30'	h40°92'	l39°80'	l39°02'	C = 67° 9' 40" .46
	l43°50'					l37°74'	h41°34'	l41°28'			
						h38°26'	h40°74'				
						h39°82'					
	42°27'	42°16'	42°11'	41°73'	40°65'	38°72'	40°90'	41°87'	41°26'	39°58'	M = 41°13'
Lesser Circle-reading	246°42'	66°42'	253°52'	73°53'	261°4'	81°5'	268°15'	88°16'	275°28'	95°28'	
* LIX & LVIII	h41°40'	l41°12'	l42°92'	h39°68'	l40°36'	h40°80'	l43°72'	h40°80'	h39°56'	l40°52'	
	h40°52'	l42°40'	l39°96'	h37°70'	l42°36'	l39°84'	l43°08'	h40°28'	h42°68'	l41°62'	
	h41°74'	l42°14'	l40°58'	l40°12'	l42°48'	l39°66'	l43°68'	l40°14'	l38°06'	l41°02'	
		l42°46'	l42°44'					l41°46'			
								l41°44'			
	41°22'	41°89'	41°48'	39°99'	41°73'	40°10'	43°49'	40°41'	40°64'	41°05'	M = 41°20'

At LX—(Continued.)

\*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†December 1860, and January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	212° 41'	32° 41'	216° 54'	39° 54'	227° 7'	47° 7'	234° 19'	54° 18'	241° 30'	61° 30'	
† LIX & LVIII	"	"	"	"	"	"	"	"	"	"	w = 12.88 1/w = 0.08 C = 53° 13' 41".14
	h40°24	h39°70	l39°82	l40°86	h39°22	l40°10	l40°24	h39°74	h42°54	l42°18	
	h39°48	h40°24	l40°14	h40°90	h39°34	l40°42	l43°28	h41°24	l41°24	l42°98	
	h40°16	l40°92	l38°96	h40°20	l40°70	l43°70	h42°06	h41°26	l43°22	l43°56	
						l42°52	h43°60		l42°58	l43°06	
						h42°66					
						h41°82					
	39°96	40°29	39°64	40°65	39°75	41°87	42°30	40°75	42°40	42°95	M = 41".06
Lesser Circle-reading	299° 55'	115° 55'	307° 6'	127° 8'	314° 18'	134° 18'	321° 29'	141° 29'	328° 42'	148° 42'	
* LVIII & LXI	h18°42	l17°40	l15°34	h18°10	l16°06	h16°30	l17°68	h16°62	h17°48	l16°70	M = 16".80
	h18°40	l16°38	l17°60	h18°62	l14°54	l16°82	l17°40	h16°44	h14°44	l17°44	
	h16°20	l17°04	l18°18	l18°40	l14°72	l15°86	l15°60	l16°14	l16°56	l15°78	
			l17°92						l17°68		
									l15°70		
	17°67	16°94	17°26	18°37	15°11	16°33	16°89	16°40	16°37	16°64	
Lesser Circle-reading	265° 55'	85° 55'	273° 8'	98° 8'	280° 20'	100° 20'	287° 32'	107° 31'	294° 44'	114° 44'	
† LVIII & LXI	h14°12	h14°24	l16°46	l15°58	h15°96	l17°38	l16°04	h15°00	h15°42	l15°10	w = 21.25 1/w = 0.05 C = 60° 6' 16".14
	h13°80	h15°14	l17°22	h14°64	h15°90	l17°54	l14°36	h14°92	l14°44	l16°44	
	h15°24	l15°00	l16°52	h15°06	l16°50	l15°84	h17°44	h16°26	l15°00	l13°64	
				h15°34		l17°42	h13°52			l16°34	
							h16°18				
	14°39	14°79	16°73	15°16	16°12	17°05	15°51	15°39	14°95	15°38	M = 15".55

At LXI											
* December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
† December 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LXIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
* LXIII & LX	"	"	"	"	"	"	"	"	"	"	
	h 51° 92	h 54° 84	l 50° 80	l 54° 46	l 51° 88	l 54° 82	l 53° 04	l 49° 86	l 53° 18	l 53° 68	
	h 53° 14	h 52° 30	l 51° 08	l 53° 82	l 53° 40	l 52° 70	l 52° 76	l 50° 46	l 55° 08	h 54° 82	
	h 52° 72	h 52° 96	l 51° 86	l 51° 80	l 51° 56	l 54° 60	l 51° 68	l 51° 08	l 51° 74	h 53° 98	
		h 53° 86		l 51° 90					l 52° 52	h 55° 30	
	52° 59	53° 49	51° 25	53° 00	52° 28	54° 04	52° 49	50° 47	53° 13	54° 45	M = 52° 72
Lesser Circle-reading	286° 17'	56° 17'	243° 30'	63° 30'	250° 42'	70° 42'	257° 55'	77° 55'	265° 6'	85° 6'	w = 22 '08 1/w = 0 '05 C = 56° 0' 54" 23
† LXIII & LX	l 54° 16	l 54° 00	l 55° 94	l 55° 04	h 55° 04	h 54° 76	h 54° 06	l 56° 46	l 55° 30	l 52° 54	
	l 55° 28	l 56° 42	l 54° 92	l 54° 60	h 54° 04	h 54° 18	h 53° 74	l 55° 28	l 54° 96	l 54° 34	
	l 54° 88	l 55° 02	l 55° 88	l 56° 22	h 54° 84	h 54° 66	l 54° 66	l 55° 42	l 54° 00	l 53° 10	
	54° 77	55° 15	55° 58	55° 29	54° 64	54° 53	54° 15	55° 72	54° 75	53° 33	M = 54° 79
Lesser Circle-reading	56° 2'	236° 2'	63° 13'	243° 13'	70° 25'	250° 25'	77° 38'	257° 37'	84° 49'	264° 49'	
* LX & LVIII	h 50° 40	h 51° 10	l 51° 44	l 50° 30	l 50° 32	l 51° 64	l 51° 32	l 52° 78	l 50° 92	l 51° 88	
	h 51° 86	h 52° 34	l 50° 18	l 50° 08	l 49° 12	l 50° 50	l 53° 54	l 52° 72	l 50° 44	h 51° 36	
	h 51° 50	h 52° 36	l 49° 98	l 51° 82	l 51° 74	l 50° 84	l 51° 80	l 52° 60	l 51° 94	h 52° 80	
			l 50° 78	l 51° 04				l 50° 90	h 51° 46		
	51° 25	51° 93	50° 53	50° 75	50° 56	50° 99	52° 22	52° 70	51° 05	51° 88	M = 51° 39
Lesser Circle-reading	292° 19'	112° 19'	299° 31'	119° 31'	306° 43'	126° 43'	313° 56'	133° 56'	321° 7'	141° 7'	w = 28 '32 1/w = 0 '04 C = 67° 41' 51" 38
† LX & LVIII	h 52° 72	h 51° 90	h 50° 06	h 52° 10	h 51° 08	h 51° 46	h 52° 56	l 51° 60	l 49° 52	l 50° 80	
	h 50° 88	h 52° 92	h 50° 84	h 53° 06	h 52° 18	h 50° 38	h 50° 98	l 52° 10	l 50° 12	l 49° 94	
	h 53° 14	h 51° 88	h 50° 86	h 51° 76	h 50° 84	h 51° 56	h 51° 00	l 51° 68	l 51° 04	l 50° 64	
	52° 25	52° 23	50° 59	52° 31	51° 37	51° 13	51° 51	51° 79	50° 23	50° 46	M = 51° 39

At LXII												
*January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.												
†January 1861, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.												
Angle between	Circle readings, telescope being set on LIX										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	25° 48'	208° 45'		
* LIX & LX	"	"	"	"	"	"	"	"	"	"	M = 54° 87  w = 13.80 1/w = 0.07 C = 57° 2' 55".09	
	h 52.86	h 52.48	l 55.28	l 54.12	l 56.10	l 55.12	l 55.12	l 52.64	h 56.52	l 53.46		
	h 53.02	l 52.52	l 54.50	l 55.50	l 55.54	h 56.54	l 55.86	l 55.48	h 56.90	l 57.04		
h 54.40	l 53.40	l 55.76	l 54.42	l 56.00	l 56.08	l 54.66	l 54.20	h 55.82	l 55.94			
							l 53.64		l 54.40			
	53.43	52.80	55.18	54.68	55.88	55.91	55.21	53.99	56.41	55.21		
Lesser Circle-reading	224° 49'	44° 48'	232° 1'	52° 1'	235° 13'	55° 13'	246° 25'	66° 25'	255° 37'	73° 37'		
† LIX & LX	l 56.88	l 54.18	l 56.60	l 55.68	l 55.38	l 54.58	h 54.84	h 52.28	l 57.00	l 55.68		M = 55° 30  w = 13.80 1/w = 0.07 C = 57° 2' 55".09
	l 56.80	l 56.64	l 54.30	l 55.80	l 53.46	l 53.88	h 54.24	h 52.56	l 54.90	l 56.02		
	l 55.78	l 57.64	l 56.24	l 54.82	l 55.38	l 51.54	h 55.46	h 54.16	l 57.14	l 55.98		
	l 56.30				l 55.46		l 54.10					
					l 54.68							
	56.49	56.19	55.71	55.43	54.74	54.03	54.85	53.28	56.35	55.89		
Lesser Circle-reading	57° 4'	237° 4'	64° 15'	244° 15'	71° 27'	251° 27'	78° 35'	258° 38'	85° 51'	265° 51'		
* LX & LXIV	h 58.56	h 59.06	l 56.46	l 58.50	l 57.76	l 59.40	l 55.56	l 59.82	l 58.22	l 55.54	M = 57° 80  w = 7.92 1/w = 0.13 C = 77° 20' 57".78	
	h 57.38	l 59.10	l 57.34	l 57.56	l 58.92	h 54.34	l 58.00	l 59.60	l 57.86	l 55.88		
	h 56.38	l 58.22	l 56.44	l 58.76	l 58.92	h 56.30	l 58.36	l 58.78	l 58.12	l 57.22		
					h 55.66				l 59.50			
	57.44	58.79	56.75	58.27	58.53	56.43	57.31	59.40	58.07	57.04		
Lesser Circle-reading	281° 52'	101° 52'	285° 4'	106° 4'	296° 16'	116° 16'	303° 28'	125° 28'	310° 40'	130° 40'		
† LX & LXV	h 41.42	l 39.64	l 39.40	l 38.00	l 36.14	l 36.14	h 37.40	h 40.98	h 39.20	l 44.14		M = 39° 29  w = 5.38 1/w = 0.19 C = 78° 8' 39".31
	h 40.90	l 37.74	l 39.70	l 38.56	l 38.42	l 38.42	h 39.40	h 40.84	l 43.02	l 39.92		
	l 36.06	l 38.78	l 38.18	l 37.56	l 36.66	l 40.36	h 41.60	h 41.60	l 43.98	l 40.30		
l 38.86				l 39.30	l 40.76	h 38.56		l 41.60	l 38.56			
l 37.66				l 40.84	l 38.98	h 39.20		l 42.20	l 36.88			
l 38.26				l 38.04				l 39.62	l 37.14			
								l 40.68	l 37.22			
	38.86	38.72	39.09	38.04	38.23	38.93	39.23	41.14	41.47	39.17		

At LXIII											
*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
†December 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	15° 48'	195° 48'	22° 59'	202° 59'	30° 11'	210° 11'	37° 22'	217° 22'	44° 35'	224° 35'	
* LXVII & LXVI	"	"	"	"	"	"	"	"	"	"	M = 43'' 37 w = 8.40 $\frac{1}{w}$ = 0.12 C = 54° 36' 43'' 37
	h 43' 94	l 41' 16	l 42' 46	l 43' 30	l 44' 52	h 43' 56	h 44' 34	h 42' 64	l 42' 06	l 43' 88	
	h 45' 60	l 40' 62	h 43' 26	l 44' 88	l 44' 40	h 43' 06	h 44' 02	h 42' 30	l 43' 04	l 44' 34	
	h 45' 14	l 41' 32	l 43' 72	l 42' 86	l 43' 98	h 42' 58	h 43' 44	h 43' 92	l 44' 00	l 42' 84	
	44' 89	41' 03	43' 15	43' 68	44' 30	43' 07	43' 93	42' 95	43' 03	43' 69	
* LXVI & LXIV	h 2' 78	l 4' 22	l 4' 60	l 5' 20	l 4' 40	h 3' 32	h 4' 48	h 5' 06	l 3' 82	h 3' 14	M = 4'' 19 w = 13.54 $\frac{1}{w}$ = 0.07 C = 71° 13' 4'' 19
	h 2' 38	l 5' 36	h 1' 68	l 4' 38	l 4' 18	l 2' 66	h 2' 90	h 4' 12	l 3' 68	h 6' 14	
	h 3' 04	l 5' 40	l 4' 54	l 4' 88	l 5' 00	l 4' 40	h 3' 48	h 5' 02	l 5' 16	h 4' 40	
		l 4' 54						l 4' 32	l 5' 84		
	2' 73	4' 99	3' 84	4' 82	4' 53	3' 46	3' 62	4' 73	4' 25	4' 88	
Lesser Circle-reading	154° 6'	334° 6'	161° 18'	341° 18'	168° 31'	348° 30'	175° 42'	355° 42'	182° 54'	2° 54'	
† LXVI & LXV	h 53' 10	l 52' 08	l 57' 30	h 53' 84	h 54' 86	h 53' 58	h 52' 14	h 53' 14	l 55' 06	l 51' 60	M = 52'' 98 w = 9.46 $\frac{1}{w}$ = 0.11 C = 74° 12' 53'' 01
	h 51' 74	l 52' 54	l 56' 50	h 52' 80	h 54' 16	h 52' 24	h 53' 32	l 53' 74	l 56' 16	l 52' 80	
	h 53' 42	l 52' 18	l 52' 52	h 52' 64	h 52' 96	h 52' 54	h 53' 66	l 51' 86	l 52' 12	l 52' 82	
		h 48' 82						l 55' 20			
		h 49' 18						h 51' 38			
		h 52' 20						h 51' 36			
	52' 75	52' 27	52' 81	53' 09	53' 99	52' 79	53' 04	52' 91	53' 70	52' 41	
Lesser Circle-reading	141° 38'	321° 38'	148° 49'	328° 49'	156° 1'	336° 1'	163° 12'	343° 12'	170° 25'	350° 25'	
* LXIV & LX	h 14' 90	l 8' 62	l 13' 68	l 14' 32	l 12' 08	h 14' 66	h 14' 02	h 16' 06	l 18' 14	h 13' 96	M = 14'' 52 w = 3.86 $\frac{1}{w}$ = 0.26 C = 84° 40' 14'' 51
	h 12' 20	l 12' 84	h 15' 72	l 14' 04	l 12' 34	l 15' 90	h 14' 16	h 17' 78	l 17' 58	h 14' 06	
	h 13' 50	l 13' 22	l 14' 02	l 15' 08	l 13' 24	l 15' 02	h 14' 94	h 17' 78	l 14' 70	h 15' 22	
	l 14' 28	l 15' 58						l 14' 28			
	13' 72	12' 57	14' 47	14' 48	12' 55	15' 19	14' 37	17' 21	16' 18	14' 41	

At LXIII—(Continued.)

\*December 1859, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†December 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	228° 19'	46° 19'	235° 31'	55° 31'	242° 43'	62° 43'	249° 55'	69° 55'	257° 7'	77° 7'	
† LXV & LX	"	"	"	"	"	"	"	"	"	"	M = 26".26 w = 6.36 1/w = 0.16 C = 81° 40' 26".29
	h24.28	l24.56	l26.36	h27.82	h26.22	h23.46	d25.61	d26.67	l27.94	l28.80	
* LX & LXI	h29.06	l26.80	l25.14	h26.10	h25.36	h23.68	d24.99	l25.00	l24.52	l29.08	M = 7".83
	h8.72	l7.28	h7.54	l9.8c	l8.98	l9.30	h5.90	h5.18	l9.10	l8.06	
Lesser Circle-reading	226° 18'	46° 18'	233° 29'	53° 29'	240° 41'	60° 41'	247° 52'	67° 52'	255° 5'	75° 5'	w = 14.70 1/w = 0.07 C = 50° 1' 6".16
† LX & LXI	l5.88	l8.84	l3.92	l4.98	h5.08	h9.72	l7.44	l5.66	l6.06	l3.08	
Lesser Circle-reading	310° 0'	129° 59'	317° 12'	187° 11'	324° 24'	144° 24'	331° 36'	151° 35'	338° 47'	158° 47'	M = 5".47
† LX & LXI	l5.20	l7.28	l5.72	l5.72	h5.22	h3.98	l5.84	l5.44	l8.68	l4.16	
	l5.36	l6.52	l5.18	l5.42	h4.96	h5.32	l5.52	l4.00	l4.64	l4.88	
	l8.64					h4.90			l5.46	l4.78	
	h4.16					h4.16			d4.91		
	h4.64										
	5.48	6.68	4.94	5.37	5.09	5.62	6.27	5.03	5.95	4.23	

At LXIV											
<i>January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite</i>											
No. 1.											
Angle between	Circle readings, telescope being set on LXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 35'	28° 49'	208° 49'	
LXII & LX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 58''·19 <i>w</i> = 9·54 $\frac{1}{w}$ = 0·10 <i>C</i> = 46° 3' 58''·20
	<i>h</i> 58·54	<i>h</i> 57·12	<i>l</i> 58·74	<i>l</i> 58·24	<i>l</i> 59·78	<i>h</i> 59·72	<i>h</i> 60·76	<i>l</i> 58·76	<i>l</i> 59·08	<i>h</i> 58·72	
	<i>h</i> 57·12	<i>h</i> 57·56	<i>l</i> 57·10	<i>h</i> 58·00	<i>l</i> 58·10	<i>h</i> 56·34	<i>h</i> 60·08	<i>l</i> 58·44	<i>l</i> 56·92	<i>h</i> 57·48	
	<i>l</i> 57·44	<i>h</i> 58·40	<i>l</i> 60·80	<i>h</i> 56·58	<i>l</i> 57·78	<i>h</i> 57·50	<i>h</i> 61·10	<i>l</i> 56·82	<i>h</i> 57·54	<i>h</i> 57·86	
			<i>l</i> 57·26			<i>h</i> 56·54	<i>l</i> 60·22		<i>h</i> 57·52		
	57·70	57·69	58·48	57·61	58·55	57·53	60·54	58·01	57·77	58·02	
LX & LXIII	<i>h</i> 28·72	<i>h</i> 28·72	<i>l</i> 29·26	<i>h</i> 26·40	<i>h</i> 27·86	<i>h</i> 28·70	<i>h</i> 27·76	<i>l</i> 28·46	<i>l</i> 27·86	<i>h</i> 27·88	<i>M</i> = 28''·13 <i>w</i> = 32·10 $\frac{1}{w}$ = 0·03 <i>C</i> = 46° 22' 28''·13
	<i>h</i> 27·32	<i>h</i> 28·42	<i>l</i> 29·92	<i>h</i> 27·86	<i>h</i> 27·14	<i>h</i> 28·08	<i>h</i> 28·14	<i>l</i> 27·72	<i>l</i> 28·30	<i>h</i> 28·76	
	<i>l</i> 29·16	<i>h</i> 28·30	<i>l</i> 27·76	<i>h</i> 27·16	<i>l</i> 27·94	<i>h</i> 27·12	<i>h</i> 28·46	<i>l</i> 28·62	<i>h</i> 28·04	<i>h</i> 27·80	
			<i>l</i> 28·66			<i>h</i> 27·66	<i>l</i> 28·64		<i>h</i> 28·40		
	28·40	28·48	28·90	27·14	27·65	27·89	28·25	28·27	28·15	28·15	
LXIII & LXVI	<i>h</i> 52·44	<i>h</i> 52·20	<i>l</i> 51·74	<i>h</i> 53·70	<i>h</i> 52·24	<i>h</i> 52·64	<i>h</i> 53·04	<i>l</i> 51·82	<i>l</i> 53·56	<i>h</i> 52·34	<i>M</i> = 52''·55 <i>w</i> = 29·20 $\frac{1}{w}$ = 0·03 <i>C</i> = 51° 8' 52''·55
	<i>h</i> 52·60	<i>h</i> 52·16	<i>l</i> 51·78	<i>h</i> 52·58	<i>h</i> 53·30	<i>h</i> 52·70	<i>h</i> 51·08	<i>l</i> 52·34	<i>l</i> 54·22	<i>h</i> 51·78	
	<i>h</i> 51·68	<i>h</i> 52·94	<i>l</i> 52·88	<i>h</i> 52·64	<i>h</i> 53·40	<i>h</i> 52·80	<i>h</i> 50·30	<i>l</i> 52·22	<i>h</i> 52·28	<i>h</i> 54·08	
			<i>l</i> 52·82			<i>h</i> 52·60	<i>l</i> 52·44		<i>h</i> 53·10		
	52·24	52·43	52·31	52·97	52·98	52·69	51·72	52·13	53·29	52·73	
LXVI & LXVIII	<i>h</i> 7·18	<i>h</i> 11·00	<i>l</i> 12·52	<i>h</i> 9·40	<i>h</i> 10·80	<i>h</i> 10·96	<i>h</i> 9·60	<i>l</i> 9·00	<i>l</i> 10·74	<i>h</i> 10·38	<i>M</i> = 10''·44 <i>w</i> = 15·80 $\frac{1}{w}$ = 0·06 <i>C</i> = 44° 26' 10''·46
	<i>h</i> 11·58	<i>h</i> 9·28	<i>l</i> 10·12	<i>h</i> 9·18	<i>h</i> 9·98	<i>h</i> 12·06	<i>h</i> 11·26	<i>l</i> 10·30	<i>l</i> 11·50	<i>h</i> 10·94	
	<i>h</i> 10·52	<i>h</i> 11·32	<i>l</i> 9·54	<i>h</i> 8·42	<i>h</i> 11·36	<i>h</i> 9·22	<i>h</i> 11·86	<i>l</i> 11·14	<i>h</i> 11·28	<i>h</i> 9·48	
	<i>h</i> 12·24		<i>l</i> 11·42			<i>h</i> 10·38	<i>l</i> 10·78		<i>h</i> 10·32		
	10·38	10·53	10·90	9·00	10·71	10·66	10·88	10·15	10·96	10·27	







At LXVI—(Continued.)												
*January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.												
†December 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.												
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 0'	180° 0'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 48'	208° 48'		
+ LXV & LXIII	"	"	"	"	"	"	"	"	"	"	M = 26''·12  w = 3·53 $\frac{1}{w}$ = 0·28 C = 56° 39' 26''·16	
	h 24'84	h 25'34	l 20'32	l 28'68	h 24'52	h 25'58	h 23'16	h 27'80	l 25'64	l 24'30		
	h 23'14	h 23'70	l 25'64	l 27'20	h 25'68	h 26'44	h 26'46	h 26'40	l 26'74	l 25'28		
	l 23'78	h 24'12	l 23'98	l 31'54	h 25'84	h 25'12	h 23'88	h 27'40	l 30'06	l 24'56		
	l 29'96	l 28'40	l 24'18	l 25'42			h 22'26		l 30'20			
	l 29'02	l 28'16	l 25'46	l 28'58			h 25'94		l 28'28			
	l 30'18	l 28'80	l 24'26	l 27'56					l 26'62			
	l 27'16		l 26'26									
	l 28'60											
	27'09	26'42	24'30	28'16	25'35	25'71	24'34	27'20	27'92	24'71		
* LXIII & LXVII	Circle readings, telescope being set on LXIII										M = 60''·39  w = 7·50 $\frac{1}{w}$ = 0·13 C = 60° 4' 60''·39	
	114° 1'	294° 1'	121° 12'	301° 12'	128° 24'	308° 24'	135° 35'	315° 35'	142° 48'	322° 48'		
	"	"	"	"	"	"	"	"	"	"		
	h 58'74	l 58'68	l 61'66	l 59'80	l 61'72	l 61'02	l 60'20	l 61'30	h 62'00	l 59'72		
	h 58'44	l 58'16	l 60'08	l 58'64	l 59'60	l 61'80	l 61'62	l 62'64	h 61'64	l 60'70		
	l 59'40	l 59'18	l 61'26	l 59'08	l 59'80	l 60'18	l 61'18	l 60'58	h 61'12	l 61'64		
	58'86	58'67	61'00	59'17	60'37	61'00	61'00	61'51	61'59	60'69		
	* LXVII & LXIX	h 63'60	l 63'70	l 63'72	l 63'36	l 62'78	l 62'14	h 59'44	h 59'24	h 60'88		l 60'78
		h 63'28	l 63'50	l 62'96	l 65'46	l 63'00	l 60'28	h 57'68	h 58'64	h 60'80		l 61'18
		l 63'22	l 64'76	l 64'22	l 65'72	l 62'72	l 59'96	h 57'52	h 59'52	h 60'82		l 62'30
63'37		63'99	63'63	64'85	62'83	60'79	58'21	59'13	60'83	61'42		
* LXIX & LXX		h 15'60	l 16'46	l 15'18	l 15'96	l 16'96	l 21'36	h 17'32	h 17'64	h 18'44	l 18'12	
		h 16'26	l 17'02	l 15'64	l 16'08	l 18'88	l 20'18	h 18'36	h 18'22	h 19'40	l 19'42	
		l 16'22	l 16'36	l 15'64	l 14'54	l 17'06	l 18'32	h 19'74	h 17'22	h 19'82	l 18'00	
		16'03	16'61	15'49	15'53	17'63	19'60	18'47	17'69	19'22	18'51	
		* LXX & LXVIII	h 3'70	l 4'10	l 3'88	l 5'08	l 2'14	l 4'42	l 1'98	l 3'38	h 1'78	l 2'76
			h 3'02	l 4'32	l 1'32	l 3'22	l 2'32	l 3'00	l 1'44	l 1'72	h 1'66	l 1'34
	l 2'26		l 3'84	l 3'32	l 3'20	l 4'00	l 3'66	l 2'10	l 2'62	h 1'32	l 1'42	
	2'99		4'09	2'96	3'83	2'82	3'69	1'84	2'57	1'59	1'84	

At LXVII											
January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on LXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 49'	
LXIX & LXVI	"	"	"	"	"	"	"	"	"	"	M = 2''·63 w = 12·17 $\frac{1}{w}$ = 0·08 C = 54° 53' 2''·63
	h 3'30	h 2'42	l 2'56	l 0'10	l 3'96	l 1'72	l 4'78	l 1'30	l 2'24	l 0'76	
	h 4'52	h 1'78	l 2'74	l 2'24	l 3'72	l 2'28	l 1'60	l 2'54	l 1'06	l 1'66	
	h 3'18	h 2'24	l 3'82	l 2'06	l 3'82	l 3'28	l 4'36	l 3'26	l 1'28	l 3'04	
			l 2'80				l 1'78			l 3'72	
	3'67	2'15	3'04	1'80	3'83	2'43	3'13	2'37	1'53	2'30	
LXVI & LXIII	h 16'60	h 17'52	l 16'56	l 17'80	l 15'42	l 16'70	l 13'36	l 18'92	l 18'32	l 17'28	M = 16''·80 w = 9·92 $\frac{1}{w}$ = 0·10 C = 65° 18' 16''·79
	h 17'64	h 16'94	l 16'74	l 15'42	l 16'82	l 15'74	l 15'34	l 17'46	l 18'28	l 17'38	
	h 16'00	h 17'84	l 16'44	l 15'56	l 17'54	l 14'72	l 16'30	l 17'22	l 18'50	l 15'84	
			l 16'96			l 16'76					
	16'75	17'43	16'58	16'44	16'59	15'72	15'44	17'87	18'37	16'83	
At LXVIII											
January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on LXIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 24'	21° 35'	201° 35'	28° 48'	208° 48'	
LXIV & LXVI	"	"	"	"	"	"	"	"	"	"	M = 16''·52 w = 10·50 $\frac{1}{w}$ = 0·10 C = 79° 12' 16''·52
	h 16'46	h 16'96	l 17'56	l 15'66	l 17'76	l 15'34	l 13'60	l 16'84	l 16'24	l 18'14	
	h 16'26	h 16'48	l 17'26	l 16'50	l 18'54	l 15'90	l 15'06	l 17'04	l 16'04	l 16'28	
	h 16'56	h 16'92	l 16'62	l 16'26	l 17'20	l 15'70	l 15'12	l 17'98	l 16'22	l 17'10	
	16'43	16'79	17'1	16'14	17'83	15'65	14'59	17'29	16'17	17'17	

At LXVIII—(Continued.)

\*January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

†December 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	275° 31'	99° 31'	286° 43'	106° 43'	293° 56'	113° 56'	301° 8'	121° 8'	308° 20'	128° 20'	
+ LXV & LXVI	"	"	"	"	"	"	"	"	"	"	M = 53° 62 w = 5 94 I/w = 0 17 C = 80° 28' 53" 60
	h 56° 12	h 54° 44	h 55° 88	l 53° 00	l 55° 70	l 53° 46	l 51° 26	l 55° 10	l 54° 14	l 52° 16	
	h 53° 20	h 53° 74	h 55° 96	l 52° 14	l 54° 04	l 51° 96	l 52° 78	l 52° 76	l 53° 96	l 55° 60	
	h 53° 98	h 55° 08	h 55° 44	l 51° 28	l 53° 28	l 53° 22	l 51° 50	l 51° 38	l 52° 40	l 52° 74	
	h 55° 84		l 55° 12	l 50° 66			l 53° 70	l 52° 32		l 54° 76	
			l 52° 06				l 52° 38	l 51° 96			
	54° 79	54° 42	55° 60	51° 83	54° 34	52° 88	52° 32	52° 70	53° 50	53° 82	
Lesser Circle-reading	79° 13'	259° 14'	86° 25'	266° 25'	93° 36'	273° 37'	100° 48'	280° 48'	108° 1'	288° 1'	M = 16° 37 w = 15 73 I/w = 0 06 C = 72° 40' 16" 36
* LXVI & LXX	h 15° 40	h 15° 48	l 15° 72	l 16° 86	l 16° 26	l 17° 02	l 18° 78	l 16° 00	l 14° 98	l 14° 06	
	h 16° 66	h 17° 60	l 16° 10	l 16° 30	l 14° 92	l 16° 10	l 16° 96	l 16° 30	l 15° 60	l 16° 02	
	h 18° 14	h 17° 34	l 16° 80	l 16° 08	l 15° 66	l 17° 62	l 16° 96	l 17° 12	l 15° 62	l 15° 86	
									l 16° 52		
	16° 73	16° 81	16° 21	16° 41	15° 61	16° 91	17° 57	16° 47	15° 40	15° 62	

At LXIX

January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on LXXII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 49'	
LXXII & LXXI	"	"	"	"	"	"	"	"	"	"	M = 35° 57 w = 14 61 I/w = 0 07 C = 52° 8' 35" 57
	h 33° 44	l 34° 86	l 34° 82	l 34° 44	h 35° 12	h 37° 18	l 37° 24	l 35° 18	h 37° 34	l 34° 34	
	h 36° 74	l 35° 22	l 34° 56	l 36° 14	h 35° 16	h 36° 64	l 36° 08	l 36° 70	h 35° 34	l 34° 26	
	h 34° 92	l 34° 80	l 35° 46	l 35° 58	l 33° 96	h 35° 82	l 35° 98	l 36° 42	h 36° 10	l 36° 02	
	h 36° 70										
	35° 45	34° 96	34° 95	35° 39	34° 75	36° 55	36° 43	36° 10	36° 26	34° 87	

At LXIX—(Continued.)											
<i>January 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 49'	
LXXI & LXX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 59''·87 <i>w</i> = 12·80 $\frac{1}{w}$ = 0·08 <i>C</i> = 53° 38' 59''·87
	<i>h</i> 62·46	<i>l</i> 57·48	<i>l</i> 60·40	<i>l</i> 60·22	<i>h</i> 60·04	<i>h</i> 59·84	<i>l</i> 60·94	<i>l</i> 61·00	<i>h</i> 56·62	<i>l</i> 60·64	
	<i>h</i> 60·44	<i>l</i> 59·34	<i>l</i> 59·40	<i>l</i> 59·44	<i>h</i> 58·90	<i>h</i> 59·98	<i>l</i> 59·46	<i>l</i> 60·94	<i>h</i> 59·72	<i>l</i> 61·48	
	<i>h</i> 60·56	<i>l</i> 59·26	<i>l</i> 61·24	<i>l</i> 58·84	<i>l</i> 59·92	<i>h</i> 60·48	<i>l</i> 58·28	<i>l</i> 60·16	<i>h</i> 58·90	<i>l</i> 59·58	
	<i>h</i> 59·20						<i>l</i> 60·02		<i>l</i> 59·88		
	60·67	58·69	60·35	59·50	59·62	60·10	59·68	60·70	58·78	60·57	
LXX & LXVI	<i>h</i> 58·76	<i>l</i> 59·12	<i>l</i> 57·58	<i>l</i> 59·44	<i>h</i> 56·72	<i>h</i> 57·88	<i>l</i> 57·30	<i>l</i> 59·90	<i>h</i> 60·80	<i>l</i> 57·44	<i>M</i> = 58''·79 <i>w</i> = 13·90 $\frac{1}{w}$ = 0·07 <i>C</i> = 70° 17' 58''·79
	<i>h</i> 56·76	<i>l</i> 58·78	<i>l</i> 58·98	<i>l</i> 59·20	<i>l</i> 59·74	<i>h</i> 58·72	<i>l</i> 58·44	<i>l</i> 58·30	<i>h</i> 59·74	<i>l</i> 58·76	
	<i>h</i> 59·50	<i>l</i> 58·64	<i>l</i> 57·32	<i>l</i> 60·78	<i>l</i> 58·94	<i>h</i> 58·94	<i>l</i> 58·96	<i>l</i> 58·76	<i>h</i> 60·16	<i>l</i> 58·06	
	<i>h</i> 59·44				<i>l</i> 59·16						
	58·62	58·85	57·96	59·81	58·64	58·51	58·23	58·99	60·23	58·09	
LXVI & LXVII	<i>h</i> 53·68	<i>l</i> 56·30	<i>l</i> 57·12	<i>l</i> 56·18	<i>h</i> 56·78	<i>h</i> 54·30	<i>l</i> 56·30	<i>l</i> 55·58	<i>h</i> 54·28	<i>l</i> 55·98	<i>M</i> = 55''·68 <i>w</i> = 10·44 $\frac{1}{w}$ = 0·10 <i>C</i> = 57° 43' 55''·68
	<i>h</i> 55·44	<i>l</i> 55·98	<i>l</i> 56·72	<i>l</i> 55·88	<i>l</i> 54·16	<i>h</i> 55·08	<i>l</i> 57·10	<i>l</i> 56·10	<i>h</i> 54·36	<i>l</i> 55·64	
	<i>h</i> 55·32	<i>l</i> 55·26	<i>l</i> 56·18	<i>l</i> 54·66	<i>l</i> 54·34	<i>h</i> 55·06	<i>l</i> 57·84	<i>l</i> 56·84	<i>h</i> 54·42	<i>l</i> 57·50	
					<i>l</i> 55·06						
	54·81	55·85	56·67	55·57	55·09	54·81	57·08	56·17	54·35	56·37	
At LXX											
<i>January and February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	206° 49'	
LXVIII & LXVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 41''·67 <i>w</i> = 11·16 $\frac{1}{w}$ = 0·09 <i>C</i> = 49° 38' 41''·68
	<i>h</i> 40·52	<i>l</i> 40·26	<i>h</i> 42·44	<i>h</i> 39·82	<i>l</i> 40·98	<i>h</i> 42·06	<i>h</i> 42·78	<i>h</i> 40·66	<i>l</i> 41·86	<i>l</i> 41·04	
	<i>h</i> 42·26	<i>l</i> 40·92	<i>h</i> 42·20	<i>h</i> 40·64	<i>l</i> 41·20	<i>h</i> 42·20	<i>h</i> 42·60	<i>h</i> 44·42	<i>l</i> 39·50	<i>l</i> 41·20	
	<i>l</i> 42·86	<i>l</i> 42·72	<i>h</i> 41·22	<i>l</i> 41·26	<i>l</i> 41·08	<i>h</i> 42·22	<i>l</i> 42·68	<i>h</i> 44·78	<i>l</i> 41·36	<i>l</i> 40·60	
								<i>h</i> 42·36	<i>l</i> 41·28		
	41·88	41·30	41·95	40·57	41·09	42·16	42·69	43·06	41·00	40·95	

At LXX—(Continued.)											
<i>January and February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 35'	28° 48'	208° 49'	
LXVI & LXIX	"	"	"	"	"	"	"	"	"	"	M = 44''·14 w = 28·05 $\frac{1}{w}$ = 0·04 C = 48° 50' 44''·13
	h44°66	l43°60	h45°90	h44°18	l43°80	h44°24	h44°22	h42°80	l42°18	l44°66	
	h43°02	l45°24	h43°60	h43°58	l44°18	h43°70	l44°72	h44°50	l43°80	l44°54	
	l43°88	l43°58	h45°12	l44°24	l43°32	h44°18	l44°46	h45°12	l43°10	l45°22	
	43°85	44°14	44°87	44°00	43°77	44°04	44°47	44°14	43°34	44°81	
LXIX & LXXI	h31°02	l30°10	h33°82	h31°38	l31°66	h31°10	h33°16	h29°86	l30°76	l31°20	M = 31''·03 w = 16·38 $\frac{1}{w}$ = 0·06 C = 73° 17' 31''·03
	h30°52	l30°42	h31°20	h30°52	l29°78	h31°90	l31°40	h29°12	l31°32	l32°12	
	l31°62	l31°40	h30°70	l30°76	l31°56	h30°38	l31°62	h29°90	l30°60	l31°78	
			h29°46						l30°82		
	31°05	30°64	31°30	30°89	31°00	31°13	32°06	29°63	30°88	31°70	
LXXI & LXXIII	h60°02	l59°66	h59°68	h62°08	l59°80	h62°06	h57°92	h58°92	l60°34	l59°70	M = 60''·36 w = 7·16 $\frac{1}{w}$ = 0·14 C = 63° 2' 60''·36
	l59°80	l59°04	h60°46	h62°34	l61°84	h60°54	h61°18	h58°82	l60°86	l60°32	
	l59°78	l59°92	h58°58	l62°66	l60°76	h61°16	l60°62	h57°84	l62°22	l59°76	
						l61°76		l61°94			
	59°87	59°54	59°57	62°36	60°80	61°25	60°37	58°53	61°34	59°93	
At LXXI											
<i>February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 25'	194° 25'	21° 35'	201° 35'	28° 48'	208° 49'	
LXXIII & LXX	l16°50	l14°26	l17°78	l15°02	l15°28	h15°98	l16°90	h14°50	l15°16	l13°94	M = 15''·86 w = 13·98 $\frac{1}{w}$ = 0·07 C = 62° 41' 15''·86
	l16°18	l15°62	l16°56	l16°20	l14°70	h16°20	h16°22	h16°16	l15°54	l14°82	
	l16°12	l16°88	l16°54	l16°34	l17°06	l17°10	h16°54	l15°06	l15°72	l14°10	
		l16°64									
	16°27	15°85	16°96	15°85	15°68	16°43	16°55	15°24	15°47	14°29	

LXXI—(Continued.)											
<i>February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite</i>											
<i>No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 25'	194° 25'	21° 35'	201° 35'	28° 48'	208° 49'	
LXX & LXIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 30".48 <i>w</i> = 10.68 $\frac{1}{w}$ = 0.09 <i>C</i> = 53° 3' 30".48
	l 29° 82	l 32° 76	l 29° 40	l 31° 56	l 31° 28	h 29° 58	l 29° 96	h 33° 46	l 31° 50	l 30° 84	
	l 29° 22	l 31° 06	l 29° 64	l 30° 92	l 31° 38	h 31° 08	h 30° 76	h 32° 12	l 30° 10	l 30° 34	
	l 28° 26	l 28° 72	l 29° 66	l 31° 02	l 28° 98	l 29° 88	h 30° 74	l 31° 14	l 29° 94	l 30° 00	
		l 29° 92									
	29° 10	30° 62	29° 57	31° 17	30° 55	30° 18	30° 49	32° 24	30° 51	30° 39	
LXIX & LXXII	l 7° 42	l 5° 20	l 8° 16	l 7° 40	l 9° 62	h 10° 30	l 9° 20	h 9° 84	l 9° 32	l 9° 76	<i>M</i> = 8".47 <i>w</i> = 5.62 $\frac{1}{w}$ = 0.18 <i>C</i> = 49° 55' 8".47
	l 8° 42	l 6° 78	l 7° 54	l 6° 96	l 10° 16	h 9° 30	h 10° 78	h 6° 10	l 9° 04	l 8° 38	
	l 7° 94	l 7° 48	l 8° 36	l 6° 38	l 8° 90	l 9° 34	h 10° 90	l 7° 38	l 8° 42	l 9° 34	
		l 5° 64					l 8° 54				
	7° 93	6° 28	8° 02	6° 91	9° 56	9° 65	10° 29	7° 97	8° 93	9° 16	
LXXII & LXXIV	l 36° 36	l 36° 02	l 37° 02	l 35° 44	l 34° 90	h 34° 56	l 34° 96	h 33° 56	l 34° 08	l 35° 70	<i>M</i> = 35".77 <i>w</i> = 10.10 $\frac{1}{w}$ = 0.10 <i>C</i> = 66° 25' 35".77
	l 37° 28	l 37° 82	l 35° 78	l 35° 92	l 35° 14	l 36° 02	h 34° 08	h 35° 94	l 34° 80	l 37° 54	
	l 37° 94	l 37° 30	l 35° 08	l 36° 02	l 35° 10	l 35° 46	h 33° 94	l 37° 26	l 36° 54	l 35° 78	
		l 36° 90					l 35° 36				
	37° 19	37° 01	35° 96	35° 79	35° 05	35° 35	34° 33	35° 53	35° 14	36° 34	
LXXIV & LXXV	l 13° 72	l 14° 30	l 14° 48	l 13° 34	l 11° 62	h 12° 48	l 14° 20	h 11° 88	l 11° 48	l 11° 74	<i>M</i> = 12".67 <i>w</i> = 13.62 $\frac{1}{w}$ = 0.07 <i>C</i> = 59° 15' 12".67
	l 12° 14	l 11° 06	l 15° 30	l 12° 50	l 12° 66	l 11° 32	h 13° 16	h 12° 84	l 13° 52	l 10° 98	
	l 12° 58	l 11° 24	l 13° 36	l 13° 22	l 12° 10	l 12° 24	h 12° 00	l 12° 22	l 12° 40	l 13° 34	
		l 13° 26									
	12° 81	12° 47	14° 38	13° 02	12° 13	12° 01	13° 12	12° 31	12° 47	12° 02	
LXXV & LXXIII	l 15° 82	l 16° 42	l 15° 08	l 16° 38	l 16° 50	h 17° 32	l 17° 56	h 17° 04	l 18° 30	l 17° 34	<i>M</i> = 16".83 <i>w</i> = 19.36 $\frac{1}{w}$ = 0.05 <i>C</i> = 68° 39' 16".84
	l 15° 98	l 18° 24	l 15° 32	l 17° 14	l 15° 94	l 16° 52	h 16° 32	h 15° 90	l 16° 94	l 17° 52	
	l 17° 28	l 19° 48	l 16° 92	l 16° 86	l 17° 18	l 16° 10	h 16° 48	l 17° 88	l 16° 54	l 16° 66	
		l 17° 88									
	16° 36	18° 01	15° 77	16° 79	16° 54	16° 65	16° 79	16° 94	17° 26	17° 17	

At LXXII											
February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on LXXIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
LXXIV & LXXI	"	"	"	"	"	"	"	"	"	"	M = 12'' 28 w = 21 30 $\frac{1}{w}$ = 0 05 C = 54° 2' 12'' 28
	l 11° 02	l 12° 26	l 12° 94	l 12° 86	l 12° 46	l 10° 62	l 11° 76	l 12° 84	l 12° 58	l 12° 52	
	l 11° 28	l 11° 78	l 12° 66	l 11° 68	l 12° 06	l 12° 78	l 13° 74	l 13° 24	l 13° 58	l 11° 82	
	l 11° 48	l 12° 52	l 12° 18	l 11° 36	l 12° 10	l 11° 42	l 12° 96	l 13° 82	l 12° 08	l 11° 86	
	11° 26	12° 19	12° 59	11° 97	12° 21	11° 61	12° 82	13° 30	12° 75	12° 07	
LXXI & LXXIX	l 16° 74	l 14° 40	l 17° 02	l 15° 36	l 16° 28	l 18° 46	l 15° 56	l 17° 88	l 15° 22	l 16° 80	M = 16'' 64 w = 8 90 $\frac{1}{w}$ = 0 11 C = 77° 56' 16'' 64
	l 16° 94	l 15° 40	l 16° 20	l 17° 58	l 17° 62	l 17° 88	l 15° 34	l 17° 70	l 15° 54	l 17° 78	
	l 16° 04	l 15° 30	l 16° 84	l 16° 74	l 16° 94	l 19° 22	l 16° 10	l 17° 18	l 16° 24	l 16° 76	
	16° 57	15° 03	16° 69	16° 56	16° 95	18° 52	15° 67	17° 59	15° 67	17° 11	
At LXXIII											
February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on LXX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 25'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
LXX & LXXI	"	"	"	"	"	"	"	"	"	"	M = 43'' 98 w = 8 88 $\frac{1}{w}$ = 0 11 C = 54° 15' 43'' 97
	h 43° 34	h 41° 22	l 45° 48	l 45° 48	l 42° 60	l 43° 66	h 44° 76	h 44° 74	h 44° 48	h 44° 90	
	h 43° 34	h 44° 04	l 45° 16	l 45° 56	l 42° 74	l 43° 20	h 45° 26	h 43° 96	h 43° 46	h 45° 76	
	h 41° 62	h 42° 16	l 45° 48	l 44° 30	l 43° 06	l 44° 46	h 43° 78	h 43° 76	h 42° 52	h 43° 92	
	l 42° 74	h 44° 08									
	42° 76	42° 88	45° 37	45° 11	42° 80	43° 77	44° 60	44° 15	43° 49	44° 86	
LXXI & LXXV	h 50° 90	h 53° 60	l 52° 10	l 52° 08	l 51° 62	l 52° 58	h 52° 58	h 54° 66	h 53° 06	h 53° 04	M = 52'' 39 w = 8 76 $\frac{1}{w}$ = 0 11 C = 54° 29' 52'' 38
	h 50° 02	h 50° 30	l 50° 90	l 51° 24	l 51° 20	l 52° 58	h 53° 06	h 53° 92	h 53° 26	h 53° 22	
	h 53° 08	h 52° 20	l 51° 62	l 52° 52	l 51° 04	l 51° 46	h 54° 66	h 54° 30	h 52° 52	h 52° 66	
	l 51° 76	h 51° 06									
	51° 44	51° 79	51° 54	51° 95	51° 29	52° 21	53° 43	54° 29	52° 95	52° 97	



At LXXIII—(Continued.)											
<i>February 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	79° 12'	259° 13'	158° 24'	338° 24'	237° 36'	57° 36'	316° 49'	136° 49'	
LXXV & LXXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 41'' 53 <i>w</i> = 12 51 $\frac{1}{w}$ = 0 08 <i>C</i> = 54° 59' 41'' 51
	h39°40	h40°22	l41°86	l38°66	l40°88	h41°40	h39°76	l40°56	l42°00	l41°20	
	h41°92	h42°12	l42°24	l41°60	l42°58	h42°78	l43°64	l42°60	l42°88	l41°76	
LXXXI & LXXXII	h40°14	h38°80	l41°14	l40°68	l42°08	h41°72	l40°40	l43°40	l40°68	l43°00	<i>M</i> = 50'' 02 <i>w</i> = 14 25 $\frac{1}{w}$ = 0 07 <i>C</i> = 55° 1' 50'' 03
	l43°46	h40°88		l39°66			l43°22	h42°24			
	l42°56						l40°80				
	41°50	40°51	41°75	40°15	41°85	41°97	41°56	42°20	41°85	41°99	
At LXXIV											
<i>February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 13'	14° 25'	194° 25'	21° 36'	201° 36'	28° 48'	208° 48'	
LXXVII & LXXVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 42'' 27 <i>w</i> = 6 60 $\frac{1}{w}$ = 0 15 <i>C</i> = 48° 18' 42'' 27
	h41°18	l41°42	l39°16	h42°62	l42°50	l44°28	l44°04	h40°28	h42°22	h42°74	
	l41°80	l41°72	l39°90	h43°10	l42°38	l43°16	l43°22	h42°70	h42°80	l43°02	
	l40°40	l42°78	l40°56	h43°42	l43°20	l43°72	l43°20	h41°34	h43°42	l41°72	
	41°13	41°97	39°87	43°05	42°69	43°72	43°49	41°44	42°81	42°49	

At LXXIV—(Continued.)											
<i>February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 13'	14° 25'	194° 25'	21° 36'	201° 36'	28° 48'	206° 49'	
LXXVI & LXXV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 57".37 <i>w</i> = 6.50 $\frac{1}{w}$ = 0.15 <i>C</i> = 53° 17' 57".37
	<i>h</i> 57.80	<i>l</i> 57.40	<i>l</i> 60.12	<i>h</i> 56.12	<i>l</i> 57.36	<i>l</i> 57.14	<i>l</i> 55.86	<i>h</i> 58.08	<i>h</i> 56.56	<i>h</i> 57.36	
	<i>l</i> 58.16	<i>l</i> 57.80	<i>l</i> 60.44	<i>h</i> 55.88	<i>l</i> 57.20	<i>l</i> 56.30	<i>l</i> 55.88	<i>h</i> 56.88	<i>h</i> 58.16	<i>l</i> 56.40	
	<i>l</i> 59.56	<i>l</i> 58.26	<i>l</i> 59.44	<i>h</i> 55.62	<i>l</i> 55.74	<i>l</i> 56.94	<i>l</i> 57.20	<i>h</i> 57.44	<i>h</i> 57.92	<i>l</i> 56.10	
	58.51	57.82	60.00	55.87	56.77	56.79	56.31	57.47	57.55	56.62	
LXXV & LXXI	<i>h</i> 5.34	<i>l</i> 5.78	<i>l</i> 3.96	<i>h</i> 5.00	<i>l</i> 4.94	<i>l</i> 4.48	<i>l</i> 5.26	<i>h</i> 3.82	<i>h</i> 5.20	<i>h</i> 5.78	<i>M</i> = 5".11 <i>w</i> = 18.38 $\frac{1}{w}$ = 0.05 <i>C</i> = 68° 49' 5".11
	<i>l</i> 4.80	<i>l</i> 4.28	<i>l</i> 3.20	<i>h</i> 4.84	<i>l</i> 4.94	<i>l</i> 6.00	<i>l</i> 5.40	<i>h</i> 4.96	<i>h</i> 3.98	<i>l</i> 6.26	
	<i>l</i> 4.90	<i>l</i> 3.82	<i>l</i> 6.12	<i>h</i> 5.74	<i>l</i> 6.84	<i>l</i> 5.86	<i>l</i> 5.50	<i>h</i> 4.40	<i>h</i> 3.46	<i>l</i> 6.48	
			<i>l</i> 6.90								
	5.01	4.63	5.05	5.19	5.57	5.45	5.39	4.39	4.21	6.17	
LXXI & LXXII	<i>h</i> 11.78	<i>l</i> 12.92	<i>l</i> 12.06	<i>h</i> 11.36	<i>l</i> 11.62	<i>l</i> 13.70	<i>l</i> 11.90	<i>h</i> 13.46	<i>h</i> 12.18	<i>h</i> 12.00	<i>M</i> = 12".18 <i>w</i> = 24.66 $\frac{1}{w}$ = 0.04 <i>C</i> = 59° 32' 12".18
	<i>l</i> 12.34	<i>l</i> 13.20	<i>l</i> 13.24	<i>h</i> 11.92	<i>l</i> 11.98	<i>l</i> 12.02	<i>l</i> 13.10	<i>h</i> 11.54	<i>h</i> 10.82	<i>l</i> 11.60	
	<i>l</i> 11.72	<i>l</i> 12.58	<i>l</i> 10.36	<i>h</i> 10.90	<i>l</i> 12.14	<i>l</i> 12.84	<i>l</i> 11.32	<i>h</i> 12.78	<i>h</i> 12.00	<i>l</i> 13.78	
			<i>l</i> 12.22								
	11.95	12.90	11.97	11.39	11.91	12.85	12.11	12.59	11.67	12.46	
At LXXV											
<i>February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	206° 49'	
LXXIII & LXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 51".65 <i>w</i> = 10.80 $\frac{1}{w}$ = 0.09 <i>C</i> = 56° 50' 51".65
	<i>h</i> 53.00	<i>l</i> 49.60	<i>l</i> 50.28	<i>h</i> 51.50	<i>l</i> 52.12	<i>l</i> 52.84	<i>h</i> 49.66	<i>h</i> 50.72	<i>h</i> 53.36	<i>l</i> 51.80	
	<i>h</i> 51.52	<i>l</i> 50.26	<i>l</i> 50.92	<i>h</i> 51.90	<i>l</i> 51.96	<i>l</i> 51.42	<i>h</i> 50.38	<i>l</i> 50.84	<i>h</i> 52.82	<i>l</i> 53.18	
	<i>l</i> 53.12	<i>l</i> 50.94	<i>l</i> 51.58	<i>l</i> 51.48	<i>l</i> 51.96	<i>l</i> 51.74	<i>h</i> 51.64	<i>l</i> 51.58	<i>l</i> 52.38	<i>l</i> 52.94	
	52.55	50.27	50.93	51.63	52.01	52.00	50.56	51.05	52.85	52.64	

At LXXV—(Continued.)											
<i>February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
LXXI & LXXIV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 42'' 66 <i>w</i> = 8 74 $\frac{1}{w}$ = 0 11 <i>C</i> = 51° 55' 42'' 66
	h 42° 64 h 41° 04 l 42° 98 l 42° 44	l 41° 54 l 43° 66 l 44° 70 l 42° 44	l 44° 46 l 42° 32 l 42° 58	h 44° 38 l 44° 40 l 44° 42	l 44° 04 l 42° 02 l 43° 12	l 41° 84 l 41° 02 l 41° 14	h 44° 24 h 42° 80 h 41° 76	l 44° 34 l 43° 16 l 41° 98	h 42° 66 h 41° 82 l 41° 94	l 41° 52 l 41° 42 l 40° 50	
	42° 22	43° 09	43° 12	44° 40	43° 06	41° 33	42° 93	43° 16	42° 14	41° 15	
LXXIV & LXXVI	h 49° 64 h 50° 32 l 49° 06 l 50° 30	l 52° 22 l 49° 98 l 48° 68 l 50° 30	l 50° 20 l 51° 66 l 50° 10	h 49° 54 l 51° 24 l 49° 14	l 49° 86 l 50° 52 l 49° 38	l 49° 66 l 51° 06 l 51° 44	h 49° 48 h 48° 80 h 48° 28	l 49° 04 l 48° 64 l 49° 04	h 50° 10 h 50° 20 l 50° 88	l 50° 00 l 49° 24 l 49° 58	<i>M</i> = 49'' 90 <i>w</i> = 16 82 $\frac{1}{w}$ = 0 06 <i>C</i> = 70° 49' 49'' 90
		49° 67	50° 30	50° 65	49° 97	49° 92	50° 72	48° 85	48° 91	50° 39	
LXXVI & LXXVIII	h 30° 86 h 31° 58 l 31° 20	l 29° 88 l 30° 30 l 30° 66	l 31° 90 l 32° 34 l 32° 34	l 29° 92 l 28° 58 l 31° 24	l 33° 12 l 34° 88 l 33° 08	l 33° 08 l 32° 42 l 33° 46	l 35° 62 l 33° 60 l 34° 06	l 33° 58 l 31° 80 l 32° 60	h 28° 30 h 29° 76 l 30° 30	l 30° 60 l 31° 66 l 32° 06	<i>M</i> = 31'' 83 <i>w</i> = 3 40 $\frac{1}{w}$ = 0 29 <i>C</i> = 57° 42' 31'' 83
		31° 21	30° 28	32° 19	29° 91	33° 69	32° 99	34° 43	32° 66	29° 45	
<i>January 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
	Circle readings, telescope being set on LXXVIII										
	0° 1'	180° 0'	79° 12'	259° 12'	158° 26'	338° 26'	237° 37'	57° 37'	316° 49'	136° 49'	
LXXVIII & LXXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 15'' 94 <i>w</i> = 15 95 $\frac{1}{w}$ = 0 06 <i>C</i> = 61° 19' 15'' 95
	l 16° 50 l 15° 92 l 16° 18	l 16° 64 l 17° 28 l 15° 36	l 16° 70 l 15° 98 l 15° 54	l 13° 58 l 15° 40 l 14° 64 l 16° 16	h 14° 98 h 16° 08 h 15° 80	h 15° 54 h 16° 38 h 16° 34	h 13° 68 h 16° 64 h 15° 32 h 16° 04	h 14° 70 h 16° 94 h 15° 30	h 17° 42 h 18° 18 h 18° 20 h 16° 72 h 15° 96	h 17° 58 l 14° 60 l 14° 92	
	16° 20	16° 43	16° 07	14° 95	15° 62	16° 09	15° 42	15° 65	17° 30	15° 70	

At LXXV—(Continued.)											
<i>January 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 0'	79° 12'	259° 12'	158° 26'	338° 26'	237° 37'	57° 37'	316° 49'	196° 49'	
LXXXI & LXXXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 48"·50 <i>w</i> = 13·92 $\frac{1}{w}$ = 0·07 <i>C</i> = 61° 21' 48"·49
	l 47·66	l 51·26	l 48·98	l 46·98	l 48·50	l 48·02	h 50·58	h 50·34	h 46·82	h 47·78	
	l 47·86	l 46·64	l 47·64	l 48·30	l 49·72	l 49·08	h 49·36	h 48·14	h 46·60	l 48·84	
	l 48·42	l 49·28	l 48·04	l 48·98	l 46·12	l 48·92	h 49·34	h 49·50	h 47·42	l 48·14	
	l 48·26			l 48·38				h 48·24			
	l 48·10			h 50·06				h 47·88			
	47·98	48·71	48·22	48·09	48·56	48·67	49·76	49·33	47·39	48·25	
At LXXVI											
<i>February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 36'	28° 48'	208° 48'	
LXXV & LXXIV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 14"·03 <i>w</i> = 12·84 $\frac{1}{w}$ = 0·08 <i>C</i> = 55° 52' 14"·03
	h 13·86	l 12·92	h 14·22	h 15·10	h 14·60	h 15·66	l 14·02	h 14·92	l 13·18	l 12·12	
	h 13·62	l 11·50	h 13·10	h 13·78	h 14·04	l 15·44	h 14·64	h 14·70	l 14·28	l 13·20	
	h 14·56	l 14·82	h 13·20	h 14·46	h 13·44	l 15·80	h 14·32	h 14·36	l 14·00	l 12·78	
	l 13·52										
	14·01	13·19	13·51	14·45	14·03	15·63	14·33	14·66	13·82	12·70	
LXXIV & LXXVII	h 57·20	l 55·66	h 54·94	h 56·76	h 59·06	h 57·48	l 58·68	h 56·90	l 56·46	l 57·78	<i>M</i> = 56"·86 <i>w</i> = 12·04 $\frac{1}{w}$ = 0·08 <i>C</i> = 57° 58' 56"·84
	h 57·68	l 57·28	h 56·46	h 56·64	h 55·08	l 57·38	h 55·94	h 56·78	l 55·62	l 58·70	
	h 57·18	l 57·40	h 57·30	h 56·26	h 54·24	l 56·10	h 56·52	h 57·02	l 56·36	l 59·62	
			h 56·62	h 56·12	h 55·70		h 56·58				
	57·35	56·78	56·33	56·45	56·02	56·99	56·93	56·90	56·15	58·70	
LXXVII & LXXIX	h 31·96	l 32·86	l 29·68	l 31·28	h 28·42	h 29·28	l 32·58	h 31·42	l 31·94	l 31·38	<i>M</i> = 31"·19 <i>w</i> = 8·23 $\frac{1}{w}$ = 0·12 <i>C</i> = 55° 17' 31"·19
	h 30·78	l 33·06	l 30·34	l 31·64	h 29·54	l 29·96	h 33·16	h 30·70	l 31·04	l 31·18	
	h 31·64	l 32·14	l 30·34	l 30·94	h 31·98	l 29·98	h 33·14	h 31·14	l 30·02	l 29·98	
					h 32·72						
	31·46	32·69	30·12	31·29	30·67	29·74	32·96	31·09	31·00	30·85	

## At LXXVI—(Continued.)

February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on LXXV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 35'	28° 48'	208° 48'	
LXXIX & LXXX	h 34° 52	l 33° 70	l 37° 48	l 35° 04	h 37° 22	h 36° 80	l 35° 54	h 33° 62	l 35° 92	l 36° 34	M = 35° 86 w = 9.86 $\frac{1}{w} = 0.10$ C = 55° 14' 35" 86
	h 36° 48	l 35° 76	l 36° 30	l 36° 44	h 37° 94	l 36° 36	h 34° 62	h 35° 78	l 37° 66	l 35° 14	
	h 36° 58	l 35° 64	l 36° 52	l 34° 52	h 35° 04	l 37° 52	h 33° 78	h 35° 80	l 37° 72	l 34° 98	
	35° 86	35° 03	36° 77	35° 33	36° 44	36° 89	34° 65	35° 07	37° 10	35° 49	
LXXX & LXXXVIII	h 3° 18	l 4° 20	l 4° 54	l 3° 60	h 5° 58	h 4° 34	l 3° 98	h 4° 82	l 4° 60	l 5° 76	M = 4° 33 w = 24.40 $\frac{1}{w} = 0.04$ C = 61° 40' 4" 33
	h 4° 14	l 3° 44	l 5° 78	l 4° 50	h 4° 18	h 3° 62	h 5° 50	h 3° 92	l 3° 26	l 4° 46	
	h 2° 78	l 4° 68	l 4° 50	l 5° 92	h 4° 36	h 4° 82	h 5° 08	h 2° 96	l 4° 00	l 3° 34	
	3° 37	4° 11	4° 94	4° 67	4° 71	4° 26	4° 85	3° 90	3° 95	4° 52	
LXXXVIII & LXXV	h 38° 38	l 36° 98	l 38° 12	l 39° 10	h 35° 98	h 38° 24	l 36° 30	h 37° 36	l 37° 52	l 37° 78	M = 37° 55 w = 24.40 $\frac{1}{w} = 0.04$ C = 73° 56' 37" 55
	h 37° 54	l 38° 30	l 36° 74	l 38° 00	h 38° 40	h 36° 44	h 37° 52	h 37° 88	l 37° 90	l 36° 76	
	h 36° 74	l 37° 46	l 37° 42	l 39° 54	h 37° 46	h 36° 90	h 36° 84	h 38° 34	l 37° 02	l 37° 56	
	37° 56	37° 58	37° 43	38° 88	37° 28	37° 19	36° 89	37° 86	37° 48	37° 37	

## At LXXVII

February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on LXXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 24'	194° 25'	21° 35'	201° 35'	28° 49'	208° 49'	
LXXIX & LXXXVI	l 24° 66	l 22° 70	h 20° 92	h 21° 02	h 22° 58	h 21° 34	l 22° 80	l 20° 92	l 20° 16	l 21° 22	M = 21° 91 w = 8.86 $\frac{1}{w} = 0.11$ C = 75° 38' 21" 91
	l 24° 22	l 22° 14	h 22° 04	h 22° 16	h 22° 32	h 20° 74	l 22° 54	l 21° 60	h 21° 58	l 21° 60	
	l 24° 00	l 22° 68	h 19° 46	h 20° 80	h 23° 22	h 21° 16	l 21° 20	l 22° 52	l 22° 04	l 21° 02	
	24° 29	22° 51	21° 04	21° 33	22° 47	21° 08	22° 18	21° 68	21° 26	21° 28	

At LXXVII—(Continued.)											
<i>February 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 49'	
LXXVI & LXXIV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 21''·42  <i>w</i> = 19·20 $\frac{1}{w}$ = 0·05 <i>C</i> = 73° 42' 21''·41
	l 21'42	l 22'28	h 20'04	h 21'02	h 20'20	h 20'66	l 21'24	l 21'72	l 22'10	l 19'22	
	l 22'08	l 23'04	h 10'08	h 21'34	h 20'06	h 21'44	l 21'24	l 21'84	l 22'20	l 21'62	
	l 22'90	l 21'70	h 22'92	h 22'06	h 20'80	h 22'02	l 20'70	l 20'56	l 21'40	l 21'02	
		h 20'54		h 20'92							
	22'13	22'34	20'87	21'77	20'72	21'37	21'06	21'37	21'90	20'62	
At LXXVIII											
<i>February 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	247° 50'	67° 50'	327° 1'	147° 1'	46° 18'	226° 18'	125° 25'	305° 25'	204° 37'	24° 37'	
LXXXIII & LXXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 21''·40  <i>w</i> = 7·28 $\frac{1}{w}$ = 0·14 <i>C</i> = 57° 21' 21''·38
	h 18'32	h 20'98	l 23'58	l 22'84	l 23'48	l 22'10	l 21'30	l 20'92	l 19'90	l 22'66	
	h 21'84	h 20'14	l 20'62	l 22'96	l 23'18	l 22'24	l 21'98	l 20'48	l 20'28	l 20'24	
	h 20'44	l 22'02	l 19'02	l 23'50	l 22'80	l 22'36	l 20'90	l 20'42	l 20'72	l 21'28	
	h 20'84	l 19'70								l 19'66	
	l 21'30	l 20'18									
	20'55	21'05	20'62	23'10	23'15	22'23	21'39	20'61	20'30	20'96	
LXXXI & LXXV	h 28'22	h 27'20	l 26'82	l 25'90	l 25'16	l 24'74	l 25'40	l 26'08	l 27'40	l 25'76	<i>M</i> = 26''·44  <i>w</i> = 19·05 $\frac{1}{w}$ = 0·05 <i>C</i> = 54° 50' 26''·43
	h 26'32	h 27'08	l 25'82	l 25'22	l 24'88	l 25'62	l 26'98	l 27'02	l 26'10	h 25'60	
	h 27'48	l 26'82	l 26'94	l 27'22	l 27'72	l 26'34	l 27'48	l 27'54	l 26'58	h 26'38	
				l 25'02							
	27'34	27'03	26'53	26'11	25'70	25'57	26'62	26'88	26'69	25'91	

At LXXVIII—(Continued.)											
March 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on LXV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 49'	208° 49'	
LXXV & LXXVI	"	"	"	"	"	"	"	"	"	"	M = 51'' <sup>15</sup> w = 27 '30 $\frac{1}{w}$ = 0 '04 C = 48° 20' 51'' <sup>15</sup>
	h 51'06	h 51'46	h 50'50	h 49'80	h 50'72	l 52'22	l 53'02	l 49'84	l 51'76	h 51'28	
	h 49'30	h 51'48	h 51'82	h 52'14	l 51'44	l 50'78	l 51'24	l 50'24	l 50'72	h 52'50	
	h 52'50	h 50'50	h 49'74	h 52'20	l 51'38	l 51'46	l 50'94	l 51'58	l 50'00	h 51'40	
	h 50'70									h 51'10	
	50'89	51'15	50'69	51'38	51'18	51'49	51'73	50'55	50'83	51'57	
LXXVI & LXXX	h 48'66	h 47'78	h 46'98	h 46'80	h 46'96	l 49'14	l 46'24	l 48'76	l 47'84	h 47'22	M = 47'' <sup>85</sup> w = 18 '80 $\frac{1}{w}$ = 0 '05 C = 63° 10' 47'' <sup>84</sup>
	h 47'04	h 48'92	h 48'40	h 47'56	l 47'64	l 48'60	l 49'50	l 48'72	l 48'12	h 48'26	
	h 48'50	h 49'22	h 48'24	h 46'22	l 47'90	l 47'46	l 47'34	l 48'58	l 47'44	h 46'34	
						l 47'20				h 46'54	
	48'07	48'64	47'87	46'86	47'50	48'40	47'57	48'69	47'80	47'09	
At LXXIX											
March 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LXXXVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 0'	7° 13'	187° 13'	14° 25'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
LXXXVI & LXXXV	"	"	"	"	"	"	"	"	"	"	M = 41'' <sup>05</sup> w = 12 '91 $\frac{1}{w}$ = 0 '08 C = 50° 43' 41'' <sup>04</sup>
	h 41'42	l 42'92	l 41'08	l 38'24	l 42'60	l 41'20	h 41'76	h 41'34	l 41'50	l 40'22	
	h 39'86	l 41'16	l 42'08	l 40'38	l 41'10	h 40'26	h 40'62	h 40'26	l 41'16	l 41'36	
	h 39'44	l 41'64	l 40'20	l 40'78	l 42'96	h 39'00	h 40'20	h 41'22	l 41'80	l 42'82	
				l 40'96							
	40'24	41'91	41'12	40'09	42'22	40'15	40'86	40'94	41'49	41'47	
LXXXV & LXXX	h 23'82	h 23'80	l 21'68	l 20'90	l 20'98	h 22'96	h 24'34	h 23'78	l 23'30	l 23'68	M = 23'' <sup>00</sup> w = 11 '40 $\frac{1}{w}$ = 0 '09 C = 60° 4' 23'' <sup>00</sup>
	h 24'68	l 23'34	l 21'78	l 23'18	l 22'18	h 23'16	h 23'74	h 23'28	l 21'24	l 23'64	
	h 24'44	l 23'90	l 23'78	l 23'16	l 22'22	h 21'24	h 23'56	h 24'18	l 22'66	l 21'56	
	24'31	23'68	22'41	22'41	21'79	22'45	23'88	23'75	22'40	22'96	

At LXXIX—(Continued.)											
<i>February and March 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 35'	201° 36'	28° 48'	208° 49'	
LXXX & LXXVI	"	"	"	"	"	"	"	"	"	"	M = 44"·82 w = 12·58 $\frac{1}{w}$ = 0·08 C = 64° 52' 44"·82
	h 45·46	h 44·04	l 46·02	l 42·98	l 46·38	l 44·36	h 44·36	h 45·56	l 44·80	l 43·36	
	h 44·26	h 43·34	l 46·82	l 44·00	l 43·78	l 45·84	h 44·78	h 44·90	l 46·18	l 43·28	
	h 45·10	h 44·12	l 45·04	l 45·82	l 46·20	l 44·16	h 45·50	h 44·14	l 46·22	l 43·78	
	44·94	43·83	45·96	44·32	45·45	44·79	44·88	44·87	45·73	43·47	
LXXVI & LXXVII	h 5·84	h 7·42	l 7·42	l 8·38	l 7·10	l 8·98	h 7·18	h 6·06	l 8·66	l 7·10	M = 7"·50 w = 21·40 $\frac{1}{w}$ = 0·05 C = 49° 4' 7"·49
	h 8·48	h 7·48	l 5·52	l 7·60	l 8·04	l 8·30	h 7·70	h 7·92	l 5·76	l 6·48	
	h 7·66	h 8·06	l 8·76	l 6·40	l 7·16	l 9·12	h 7·88	h 8·22	l 6·68	l 7·86	
			l 6·36						l 7·48		
	7·33	7·65	7·02	7·46	7·43	8·80	7·59	7·40	7·15	7·15	
At LXXX											
<i>March 1860, observed by Mr. H. Keelan with Lieut.-Colonel Waugh's 24-inch Theodolite No. 1.</i>											
Angle between	Circle readings, telescope being set on LXXVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
LXXVIII & LXXVI	"	"	"	"	"	"	"	"	"	"	M = 8"·16 w = 6·65 $\frac{1}{w}$ = 0·15 C = 55° 9' 8"·16
	h 5·40	l 7·38	l 7·44	h 8·92	h 8·84	h 9·86	h 6·94	h 6·80	h 8·58	l 6·30	
	h 7·50	l 7·82	h 8·90	h 8·88	h 7·42	l 10·88	h 7·20	h 10·06	h 9·76	l 9·96	
	h 6·68	l 5·04	h 7·68	h 8·38	h 8·38	l 8·06	h 7·14	h 9·98	h 10·66	l 8·58	
		l 6·10	h 8·34			l 9·04		h 8·88		l 8·50	
	6·53	6·59	8·09	8·73	8·21	9·46	7·09	8·93	9·67	8·34	
LXXVI & LXXIX	h 40·30	l 39·02	l 39·10	h 39·00	h 39·68	h 39·80	h 41·66	h 41·74	h 39·22	l 40·32	M = 39"·96 w = 16·56 $\frac{1}{w}$ = 0·06 C = 59° 52' 39"·96
	h 39·42	l 39·66	h 38·90	h 39·68	h 39·58	l 39·48	h 42·06	h 39·78	h 38·50	l 39·30	
	h 39·88	l 41·24	h 40·84	h 39·80	h 39·22	l 40·60	h 40·82	h 40·54	h 39·06	l 41·20	
			h 39·70				h 39·62				
	39·87	39·97	39·64	39·49	39·49	39·96	41·51	40·42	38·93	40·27	



At LXXX—(Continued.)											
<i>March 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 13'	14° 24'	194° 25'	21° 36'	201° 36'	28° 48'	208° 49'	
LXXIX & LXXXV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 4''·46 <i>w</i> = 8·62 $\frac{1}{w}$ = 0·12 <i>C</i> = 58° 59' 4''·46
	h 5'·16	l 2'·92	l 2'·98	l 3'·04	h 6'·24	l 4'·36	l 5'·08	l 4'·64	l 6'·14	l 3'·46	
	l 3'·14	l 2'·68	l 2'·54	l 3'·74	l 4'·82	l 4'·48	l 7'·00	l 4'·72	l 5'·56	l 5'·80	
	l 4'·72	l 4'·10	l 3'·74	l 3'·06	l 4'·92	l 4'·40	l 6'·04	l 4'·14	l 5'·24	l 5'·18	
						l 5'·74					
	4'·34	3'·23	3'·09	3'·28	5'·33	4'·41	5'·97	4'·50	5'·65	4'·81	
LXXXV & LXXXVII	l 14'·06	l 19'·08	l 19'·20	h 19'·52	h 19'·40	l 19'·38	h 20'·12	h 21'·36	l 16'·92	h 18'·88	<i>M</i> = 18''·36 <i>w</i> = 7·68 $\frac{1}{w}$ = 0·13 <i>C</i> = 57° 33' 18''·35
	l 17'·10	l 20'·90	h 17'·28	h 17'·28	h 19'·56	l 17'·56	h 16'·14	h 18'·98	l 16'·72	l 18'·60	
	l 17'·10	l 15'·42	h 18'·78	h 18'·60	l 19'·90	l 20'·02	h 17'·96	h 18'·22	l 17'·52	l 18'·14	
	l 18'·40	l 18'·34					h 17'·86	h 18'·78			
	16'·67	18'·44	18'·42	18'·47	19'·62	18'·99	18'·02	19'·34	17'·05	18'·54	
At LXXXI											
<i>February 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	79° 13'	259° 13'	158° 24'	338° 24'	237° 37'	57° 37'	316° 48'	136° 49'	
LXXXII & LXXXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 23''·23 <i>w</i> = 8·60 $\frac{1}{w}$ = 0·12 <i>C</i> = 62° 2' 23''·20
	h 23'·84	l 24'·08	l 22'·46	l 23'·80	l 23'·16	l 24'·98	h 23'·06	l 21'·64	h 20'·62	l 23'·76	
	h 24'·14	l 23'·46	l 25'·32	l 22'·46	l 21'·78	l 23'·62	l 19'·92	l 25'·26	h 24'·90	l 22'·46	
	l 22'·26	l 22'·46	l 25'·14	h 25'·46	l 24'·02	l 24'·12	l 21'·16	l 23'·22	h 22'·30	h 24'·48	
			l 23'·10	h 25'·36			l 20'·66	l 21'·92	h 21'·24		
							l 22'·30	l 22'·44	h 21'·86		
	23'·41	23'·33	24'·01	24'·27	22'·99	24'·24	21'·42	22'·90	22'·18	23'·57	

At LXXXI—(Continued.)											
<i>February 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	79° 13'	259° 13'	158° 24'	338° 24'	237° 37'	57° 37'	316° 48'	136° 49'	
LXXIII & LXXV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 30" 32 <i>w</i> = 6 95 $\frac{1}{w}$ = 0 14 <i>C</i> = 63° 38' 30" 32
	h 29° 76	l 30° 98	l 30° 66	h 27° 60	l 30° 94	l 28° 70	l 32° 90	l 31° 50	h 30° 22	l 31° 42	
	h 31° 52	l 29° 50	l 29° 74	h 27° 46	l 32° 40	l 28° 94	l 30° 60	l 33° 24	h 29° 54	h 28° 72	
	l 32° 34	l 31° 82	l 30° 02	h 30° 16	l 29° 88	l 29° 96	l 28° 68	l 31° 02	h 30° 86	h 28° 56	
							l 31° 84			h 29° 82	
							h 29° 04				
	31° 21	30° 77	30° 14	28° 41	31° 07	29° 20	30° 61	31° 92	30° 21	29° 63	
LXXV & LXXVIII	h 17° 66	l 20° 86	l 16° 76	h 16° 88	l 18° 90	l 18° 18	l 15° 70	l 14° 04	h 18° 28	l 17° 58	<i>M</i> = 17" 61 <i>w</i> = 10 47 $\frac{1}{w}$ = 0 10 <i>C</i> = 63° 50' 17" 57
	h 16° 90	l 18° 26	l 15° 66	h 17° 26	l 17° 26	l 17° 80	l 18° 90	l 15° 50	h 18° 52	h 18° 16	
	h 18° 92	l 16° 54	l 15° 36	h 17° 62	l 18° 24	l 17° 50	l 20° 26	l 15° 18	h 18° 28	h 18° 56	
		l 16° 44	h 16° 38				h 16° 70	h 18° 96	d 20° 10		
		l 15° 48	h 17° 52				l 17° 38	h 17° 16			
							h 18° 12				
	17° 83	17° 52	16° 34	17° 25	18° 13	17° 83	17° 79	16° 49	18° 80	18° 10	
LXXVIII & LXXXIII	h 44° 52	l 43° 42	h 48° 86	h 45° 96	l 45° 76	l 43° 30	l 46° 12	l 46° 58	h 45° 52	l 44° 84	<i>M</i> = 45" 87 <i>w</i> = 11 09 $\frac{1}{w}$ = 0 09 <i>C</i> = 52° 36' 45" 88
	h 45° 94	l 46° 86	h 46° 90	h 47° 70	l 46° 56	l 44° 60	l 45° 20	l 45° 46	h 45° 04	l 44° 60	
	l 45° 68	l 45° 00	h 47° 22	h 46° 96	l 46° 10	l 43° 74	h 47° 36	l 45° 46	h 44° 98	h 45° 50	
		l 46° 80	h 48° 90	h 45° 32		l 46° 32	l 45° 90		d 46° 92		
		l 46° 76	h 46° 10			h 45° 48					
	45° 38	45° 77	47° 60	46° 49	46° 14	44° 69	46° 15	45° 83	45° 62	44° 98	
LXXXIII & LXXXIV	h 32° 94	l 33° 60	l 32° 76	l 33° 18	l 31° 96	l 33° 84	h 33° 10	l 32° 78	h 32° 68	l 32° 48	<i>M</i> = 32" 94 <i>w</i> = 17 12 $\frac{1}{w}$ = 0 06 <i>C</i> = 58° 57' 32" 95
	h 33° 50	l 31° 46	l 33° 48	h 34° 90	l 31° 62	l 34° 10	h 32° 86	l 31° 52	h 34° 26	l 33° 80	
	l 33° 92	l 35° 24	d 33° 04	d 31° 84	l 32° 94	l 31° 44	l 31° 66	l 31° 76	h 33° 86	h 34° 56	
		l 33° 40	d 33° 58	d 31° 02		h 31° 94					
		l 32° 62									
	33° 45	33° 26	33° 22	32° 74	32° 17	32° 83	32° 54	32° 02	33° 60	33° 61	
LXXXIV & LXXXII	h 30° 88	l 29° 98	l 29° 32	l 30° 58	l 27° 12	l 30° 06	h 29° 60	l 32° 46	h 32° 84	l 29° 70	<i>M</i> = 30" 14 <i>w</i> = 9 01 $\frac{1}{w}$ = 0 11 <i>C</i> = 58° 54' 30" 12
	h 30° 46	l 32° 42	l 28° 06	l 32° 94	l 29° 94	l 29° 82	h 29° 98	l 31° 08	h 28° 12	l 32° 56	
	h 27° 68	l 31° 16	l 28° 98	h 29° 78	l 31° 48	l 31° 16	l 29° 56	l 32° 74	h 30° 94	l 30° 46	
	l 30° 08	l 29° 80	l 28° 92	d 28° 90	l 30° 44				h 28° 34	h 28° 96	
		l 29° 56		d 28° 08	h 29° 84				h 28° 76		
	29° 78	30° 58	28° 82	30° 06	29° 76	30° 35	29° 71	32° 09	29° 80	30° 42	

At LXXXII											
<i>February 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	232° 2'	52° 2'	311° 13'	131° 13'	90° 26'	210° 26'	109° 38'	289° 38'	188° 49'	8° 49'	
LXXIII & LXXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 47''·11 <i>w</i> = 23·98 $\frac{1}{w}$ = 0·04 <i>C</i> = 62° 55' 47''·09
	h47·22	h46·28	l48·36	l46·32	l47·80	l47·52	l45·10	l45·10	h46·96	h47·40	
	h45·24	l47·52	l47·74	l46·70	l47·14	l46·74	l46·30	l46·30	h47·60	h47·20	
	h47·62	l46·92	l46·40	l48·28	l47·50	l48·52	l48·06	l46·36	h47·52	h48·38	
							l47·04	h46·94		h46·08	
	46·69	46·91	47·50	47·10	47·48	47·59	46·63	46·16	47·36	47·66	
LXXXI & LXXXIV	h 7·84	h 8·80	l10·20	l11·42	l11·96	l 8·60	l11·12	l13·04	h11·40	h10·12	<i>M</i> = 10''·22 <i>w</i> = 7·03 $\frac{1}{w}$ = 0·14 <i>C</i> = 65° 3' 10''·22
	h 7·84	h10·16	l 9·08	l11·26	l 9·30	l 9·48	l 8·68	l11·48	h11·22	h10·22	
	h 8·92	h10·28	l10·38	l11·28	l10·72	l 7·72	l 9·44	l13·92	h10·40	h10·32	
	l10·36					l 8·70	h11·14				
	l10·04						h11·46				
	9·00	9·75	9·89	11·32	10·66	8·60	9·49	12·21	11·01	10·22	
At LXXXIII											
<i>March 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	228° 41'	48° 41'	302° 53'	122° 53'	22° 5'	202° 5'	101° 17'	281° 17'	180° 30'	0° 30'	
LXXXIV & LXXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 36''·83 <i>w</i> = 6·93 $\frac{1}{w}$ = 0·14 <i>C</i> = 66° 17' 36''·86
	l36·68	h40·04	h37·48	l36·32	l39·18	h37·00	l37·06	l36·24	l37·14	l34·78	
	l33·26	h41·74	l38·44	l37·30	l39·82	h37·52	l35·68	l36·30	l37·00	h37·16	
	h37·22	h39·10	l37·98	h37·10	l36·66	l35·40	l33·42	l36·62	l34·44	l35·56	
	h36·28	l36·44	l35·46		d37·26	l37·60	l36·20		l37·58		
	h35·68	l36·82	l37·98								
		l37·46									
	35·82	38·60	37·47	36·91	38·23	36·88	35·59	36·39	36·54	35·83	

At LXXXIII—(Continued.)											
<i>March 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	223° 41'	43° 41'	302° 53'	122° 53'	22° 5'	202° 5'	101° 17'	281° 17'	180° 30'	0° 30'	
LXXXI & LXXXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 53"·60  <i>w</i> = 16·87 $\frac{1}{w}$ = 0·06 <i>C</i> = 70° 1' 53"·59
	l 53'·20	h 50'·24	h 51'·60	l 54'·74	l 52'·08	h 52'·22	l 52'·58	l 52'·50	l 52'·88	l 54'·06	
	l 55'·66	h 51'·58	l 54'·90	l 52'·68	l 54'·16	l 53'·74	l 54'·62	l 53'·90	l 54'·56	l 54'·18	
	h 54'·20	l 56'·50	l 52'·88	l 54'·56	l 53'·24	l 53'·66	l 54'·84	l 52'·80	l 55'·78	h 52'·90	
	h 54'·16	l 53'·24	l 54'·22						l 52'·66		
		l 53'·18	l 53'·32								
		l 54'·32									
	54'·31	53'·18	53'·38	53'·99	53'·16	53'·21	54'·01	53'·07	53'·97	53'·71	
At LXXXIV											
<i>February and March 1861, observed by Lieutenant J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	79° 13'	259° 13'	158° 25'	338° 25'	237° 37'	57° 36'	316° 48'	136° 48'	
LXXXII & LXXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 20"·51  <i>w</i> = 8·27 $\frac{1}{w}$ = 0·12 <i>C</i> = 56° 2' 20"·53
	h 20'·36	h 19'·24	l 20'·30	l 23'·36	h 19'·66	l 20'·36	l 18'·38	h 21'·64	h 21'·60	h 20'·58	
	h 22'·76	h 19'·76	l 22'·54	l 18'·40	l 23'·08	l 20'·40	l 19'·84	h 19'·32	h 21'·16	h 19'·40	
	h 23'·20	h 19'·34	l 21'·60	l 20'·80	l 21'·44	l 21'·42	l 18'·44	l 19'·06	h 20'·44	l 19'·32	
	h 19'·82			l 19'·90	l 20'·66			l 19'·94			
	l 22'·44			l 22'·14							
				l 20'·16							
	21'·72	19'·45	21'·48	20'·79	21'·21	20'·73	18'·89	19'·99	21'·07	19'·77	
LXXXI & LXXXIII	h 49'·68	h 50'·08	l 51'·72	l 48'·36	h 48'·84	l 51'·26	l 50'·78	l 51'·36	h 51'·52	h 51'·68	<i>M</i> = 50"·91  <i>w</i> = 10·13 $\frac{1}{w}$ = 0·10 <i>C</i> = 54° 44' 50"·90
	h 50'·74	h 50'·50	l 51'·46	l 53'·00	h 51'·12	l 49'·68	l 51'·54	l 52'·26	h 52'·28	h 52'·36	
	h 50'·12	h 52'·72	l 48'·84	l 49'·54	l 49'·60	l 50'·66	h 52'·50	l 49'·28	h 52'·22	l 51'·06	
		l 51'·52	l 49'·68	l 51'·78			h 52'·66	d 52'·23			
				l 48'·14							
				l 49'·22							
	50'·18	51'·21	50'·43	50'·01	49'·85	50'·53	51'·87	51'·28	52'·01	51'·70	

At LXXXV											
<i>March 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	208° 49'	
LXXXVIII & LXXXIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 17".34 <i>w</i> = 6.44 $\frac{1}{w}$ = 0.16 <i>C</i> = 46° 26' 17".33
	h18.32 l18.34 l20.84	l16.22 l15.60 l17.74	h16.64 h16.32 h16.14	h17.90 l14.24 l15.24	l17.72 l16.06 h17.94	h18.02 h19.34 l19.86	l17.10 l19.04 h17.78	h16.82 h16.50 l18.04	h17.04 h17.68 h16.64	l16.56 l17.92 l17.32	
	19.17	16.52	16.37	15.53	17.24	19.07	17.97	17.12	17.12	17.27	
LXXXIX & LXXXVIII	h17.20 h16.74 l13.98 l13.62	l16.30 l13.86 l11.86 l15.66	h14.60 l13.64 l14.92	l14.38 l13.46 l13.90	l12.84 l13.64 h15.56	h13.58 h14.28 l14.98	l17.86 l16.00 h15.20	h14.90 h15.60 l15.88	h17.72 h16.52 h16.32	l14.62 l16.26 l15.42	<i>M</i> = 15".05 <i>w</i> = 7.22 $\frac{1}{w}$ = 0.14 <i>C</i> = 59° 18' 15".05
	15.39	14.42	14.39	13.91	14.01	14.28	16.35	15.46	16.85	15.43	
LXXXVII & LXXX	h37.98 h38.66 l40.10	l37.00 l37.04 l38.30	l37.80 l38.94 l37.98	l40.10 l35.54 l35.50	l40.40 l38.32 h36.78 h36.86	h39.16 h40.32 l38.24	l36.82 l36.80 h39.26	h37.70 h37.98 h36.40	h36.16 h37.66 h37.98	l38.32 l37.34 l36.76	<i>M</i> = 37".86 <i>w</i> = 10.76 $\frac{1}{w}$ = 0.09 <i>C</i> = 69° 2' 37".85
	38.91	37.45	38.24	36.97	38.09	39.24	37.63	37.36	37.27	37.47	
LXXX & LXXXIX	h30.26 h30.50 l27.82 l32.36	l31.30 l31.10 l29.62	l34.16 l32.52 l32.92	l32.46 l33.90 l30.38 l33.34	l32.38 l33.28 h33.40 h34.52	h31.80 h30.80 l28.92	l31.00 l31.98 h29.36	h30.54 h30.84 h32.38	h31.92 h31.32 h30.98	l33.40 l34.44 l32.26	<i>M</i> = 31".74 <i>w</i> = 5.16 $\frac{1}{w}$ = 0.19 <i>C</i> = 60° 56' 31".74
	30.24	30.67	33.20	32.52	33.40	30.51	30.78	31.25	31.41	33.37	
LXXIX & LXXXVI	h11.78 h11.92 l13.88	l14.54 l14.88 l15.92 l12.18	h12.46 h13.32 h12.34	l12.60 l13.14 l13.36	l12.30 l12.70 h12.56	h13.04 h13.18 h12.52	l14.18 l12.76 h14.48	h13.62 h13.66 h13.44	h13.02 h11.38 h14.36	l11.22 l10.80 l12.54	<i>M</i> = 12".99 <i>w</i> = 12.08 $\frac{1}{w}$ = 0.08 <i>C</i> = 71° 43' 13".00
	12.53	14.38	12.71	13.03	12.52	12.91	13.81	13.57	12.92	11.52	

At LXXXV—(Continued.)											
<i>March 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	208° 49'	
LXXXVI & LXXXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 4''·94 <i>w</i> = 9·30 $\frac{1}{w}$ = 0·11 <i>C</i> = 52° 33' 4''·94
	h 4'·16	l 4'·58	h l 5'·32	l 5'·24	l 4'·82	h 3'·86	l 5'·44	h 5'·06	h 5'·06	l 3'·70	
	l 4'·66	l 5'·46	h l 5'·10	l 6'·34	l 5'·88	h 2'·68	l 4'·08	h 6'·28	h 3'·92	l 3'·70	
	l 6'·10	l 8'·32	h 5'·54	l 7'·48	h 4'·58	l 3'·40	h 3'·10	l 4'·42	h 4'·48	l 4'·06	
		l 5'·26				h 5'·64					
	4'·97	5'·91	5'·32	6'·35	5'·09	3'·31	4'·57	5'·55	4'·49	3'·82	
At LXXXVI											
<i>March 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
LXXXVIII & LXXXV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 30''·56 <i>w</i> = 12·26 $\frac{1}{w}$ = 0·08 <i>C</i> = 69° 17' 30''·56
	l 31'·90	l 28'·78	l 29'·76	l 31'·22	l 31'·88	l 30'·82	l 29'·18	l 29'·38	l 32'·22	l 31'·80	
	l 30'·52	l 28'·40	l 29'·36	l 30'·44	l 31'·54	l 31'·88	l 31'·36	l 29'·24	l 30'·38	l 31'·88	
	l 30'·48	l 31'·30	l 29'·92	l 29'·24	l 31'·68	h 31'·26	l 30'·64	l 29'·64	l 30'·36	l 30'·08	
		l 29'·92									
	30'·97	29'·60	29'·68	30'·30	31'·70	31'·32	30'·39	29'·42	30'·99	31'·25	
LXXXV & LXXXIX	l 5'·86	l 5'·28	l 7'·80	l 4'·52	l 4'·36	l 7'·14	l 5'·72	l 7'·42	l 6'·34	l 4'·92	<i>M</i> = 6'·18 <i>w</i> = 11·00 $\frac{1}{w}$ = 0·09 <i>C</i> = 57° 33' 6''·18
	l 6'·56	l 6'·60	l 6'·40	l 4'·82	l 4'·86	l 6'·46	l 7'·56	l 7'·06	l 6'·66	l 3'·90	
	l 5'·98	l 6'·92	l 5'·84	l 5'·56	l 6'·46	h 7'·10	l 8'·20	l 5'·88	l 7'·52	l 5'·68	
	6'·13	6'·27	6'·68	4'·97	5'·23	6'·90	7'·16	6'·79	6'·84	4'·83	

At LXXXVII											
March 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on LXXX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
LXXX & LXXXV	"	"	"	"	"	"	"	"	"	"	M = 4''·55 w = 5·86 $\frac{1}{w}$ = 0·17 C = 53° 24' 4''·54
	h 2'72 h 4'16 h 3'92	l 3'86 l 1'56 l 0'16 l 4'42	l 6'92 h 3'78 h 5'90 h 3'22	h 5'62 l 7'00 l 5'58	l 5'84 l 6'42 l 5'74	l 5'20 l 6'36 l 4'92	l 4'52 l 3'56 l 5'34	l 4'10 l 4'84 l 4'94	l 4'82 l 5'26 h 3'96	h 3'56 h 3'26 h 2'38	
	3'60	2'50	4'96	6'07	6'00	5'49	4'47	4'63	4'68	3'07	
LXXXV & LXXXIX	h 34'62 h 33'28 h 32'78 h 31'26 h 32'16	l 30'76 l 36'00 l 33'48 l 30'64 h 31'66	l 32'18 l 31'08 h 31'30	l 29'54 l 30'80 l 30'64	l 31'54 l 31'84 l 31'90	l 28'28 l 30'56 l 32'88 l 31'96	l 30'74 l 31'00	l 32'38 l 33'54 l 28'24 l 30'94	l 29'10 l 30'62 h 30'96	h 33'86 h 32'82 h 33'44 h 32'68 h 33'42 h 35'48	M = 31''60 w = 5·22 $\frac{1}{w}$ = 0·19 C = 61° 1' 31''65
		32'82	32'51	31'52	30'33	31'76	30'92	29'99	32'29	30'23	
At LXXXVIII											
March 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on XCI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XCI & XC	"	"	"	"	"	"	"	"	"	"	M = 26''·16 w = 8·32 $\frac{1}{w}$ = 0·12 C = 69° 2' 26''·16
	h 27'24 h 26'82 h 28'08	l 24'32 l 25'44 l 25'74	l 24'30 l 23'34 l 27'12 l 25'10	l 25'76 l 26'24 h 25'50	h 27'56 l 28'46 l 28'58	l 26'70 h 25'80 h 27'40	l 25'90 l 25'38 l 25'70	l 25'46 l 25'42 l 25'42	h 26'66 h 27'16 h 25'88	h 25'08 h 25'74 l 26'30	
	27'38	25'17	24'97	25'83	28'20	26'63	25'66	25'43	26'57	25'71	

At LXXXVIII—(Continued.)											
<i>March 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XC & LXXXIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 27".23  <i>w</i> = 10.04 $\frac{1}{w}$ = 0.10 <i>C</i> = 56° 13' 27".24
	<i>h</i> 26.64	<i>l</i> 25.90	<i>l</i> 29.66	<i>l</i> 27.22	<i>h</i> 26.30	<i>l</i> 29.56	<i>l</i> 26.22	<i>l</i> 26.84	<i>h</i> 28.72	<i>h</i> 27.86	
	<i>h</i> 25.40	<i>l</i> 26.52	<i>l</i> 28.82	<i>l</i> 27.70	<i>h</i> 26.32	<i>h</i> 26.74	<i>l</i> 26.66	<i>l</i> 28.96	<i>h</i> 26.88	<i>h</i> 26.86	
	<i>h</i> 26.58	<i>l</i> 25.66	<i>l</i> 28.30	<i>l</i> 27.58	<i>l</i> 25.76	<i>h</i> 27.98	<i>l</i> 27.56	<i>l</i> 27.74	<i>h</i> 28.18	<i>l</i> 26.34	
	26.21	26.03	28.68	27.50	26.13	28.09	26.81	27.85	27.93	27.02	
LXXXIX & LXXXV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 32".34  <i>w</i> = 16.28 $\frac{1}{w}$ = 0.06 <i>C</i> = 71° 4' 32".32
	<i>h</i> 32.36	<i>l</i> 33.58	<i>l</i> 29.38	<i>l</i> 31.60	<i>h</i> 31.10	<i>l</i> 32.50	<i>l</i> 33.70	<i>l</i> 31.96	<i>h</i> 32.80	<i>h</i> 33.74	
	<i>h</i> 33.22	<i>l</i> 31.48	<i>l</i> 33.52	<i>l</i> 31.36	<i>h</i> 31.70	<i>h</i> 32.80	<i>l</i> 32.36	<i>l</i> 32.26	<i>h</i> 32.76	<i>h</i> 33.32	
	<i>h</i> 32.92	<i>l</i> 32.90	<i>l</i> 29.62	<i>h</i> 32.76	<i>l</i> 32.86	<i>h</i> 31.84	<i>l</i> 32.14	<i>l</i> 33.10	<i>h</i> 32.90	<i>l</i> 31.58	
	32.83	32.65	30.91	31.91	31.89	32.38	32.73	32.44	32.82	32.88	
LXXXV & LXXXVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 24".57  <i>w</i> = 16.06 $\frac{1}{w}$ = 0.06 <i>C</i> = 58° 9' 24".56
	<i>h</i> 24.80	<i>l</i> 24.76	<i>l</i> 24.74	<i>l</i> 26.00	<i>h</i> 25.32	<i>l</i> 20.46	<i>l</i> 25.08	<i>l</i> 23.70	<i>h</i> 25.06	<i>h</i> 25.22	
	<i>h</i> 24.28	<i>l</i> 24.22	<i>l</i> 22.58	<i>l</i> 26.00	<i>h</i> 24.32	<i>h</i> 23.72	<i>l</i> 24.76	<i>l</i> 23.84	<i>h</i> 24.86	<i>l</i> 24.18	
	<i>h</i> 25.80	<i>l</i> 25.58	<i>l</i> 25.66	<i>h</i> 23.98	<i>l</i> 23.26	<i>h</i> 25.48	<i>l</i> 25.24	<i>l</i> 23.24	<i>h</i> 24.42	<i>l</i> 23.70	
	24.96	24.85	24.63	25.33	24.30	23.82	25.03	23.59	24.78	24.37	
At LXXXIX											
<i>March 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	208° 49'	
LXXXVII & LXXXV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 14".66  <i>w</i> = 10.38 $\frac{1}{w}$ = 0.10 <i>C</i> = 59° 40' 14".66
	<i>h</i> 14.06	<i>l</i> 16.52	<i>l</i> 12.72	<i>h</i> 14.12	<i>h</i> 16.24	<i>l</i> 15.00	<i>h</i> 15.40	<i>l</i> 13.50	<i>l</i> 12.70	<i>l</i> 16.48	
	<i>h</i> 14.44	<i>l</i> 15.24	<i>l</i> 15.26	<i>h</i> 14.08	<i>l</i> 13.44	<i>l</i> 17.38	<i>h</i> 14.12	<i>l</i> 12.90	<i>l</i> 12.30	<i>l</i> 13.68	
	<i>h</i> 15.46	<i>l</i> 14.22	<i>l</i> 14.82	<i>h</i> 15.56	<i>l</i> 13.40	<i>l</i> 13.76	<i>l</i> 17.32	<i>l</i> 12.38	<i>l</i> 16.12	<i>l</i> 14.40	
	14.65	15.33	14.27	14.59	14.36	15.70	15.65	13.40	13.78	14.85	



At LXXXIX—(Continued.)											
<i>March 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	206° 49'	
LXXXV & LXXXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 10''·02 <i>w</i> = 9·19 $\frac{1}{w}$ = 0·11 <i>C</i> = 62° 29' 10''·04
	<i>h</i> 9·82	<i>l</i> 9·62	<i>l</i> 11·66	<i>h</i> 10·04	<i>h</i> 6·56	<i>l</i> 11·70	<i>h</i> 8·84	<i>l</i> 10·04	<i>l</i> 13·84	<i>h</i> 9·58	
	<i>h</i> 10·18	<i>l</i> 9·06	<i>l</i> 9·02	<i>h</i> 10·00	<i>l</i> 12·56	<i>l</i> 8·80	<i>h</i> 10·38	<i>l</i> 9·44	<i>l</i> 10·36	<i>h</i> 10·80	
	<i>h</i> 9·08	<i>l</i> 8·50	<i>l</i> 9·24	<i>h</i> 9·46	<i>l</i> 11·20	<i>l</i> 11·82	<i>h</i> 9·04	<i>l</i> 13·02	<i>l</i> 10·14	<i>l</i> 8·84	
					<i>l</i> 9·24	<i>l</i> 8·44	<i>l</i> 7·84	<i>l</i> 12·74	<i>h</i> 10·60		
					<i>l</i> 10·92						
	9·69	9·06	9·97	9·83	10·10	10·19	9·03	11·31	11·24	9·74	
LXXXVIII & XC	<i>h</i> 54·82	<i>h</i> 54·62	<i>l</i> 54·62	<i>h</i> 54·28	<i>h</i> 56·22	<i>l</i> 54·18	<i>h</i> 55·84	<i>l</i> 54·86	<i>l</i> 50·42	<i>h</i> 56·42	<i>M</i> = 54''·88 <i>w</i> = 11·23 $\frac{1}{w}$ = 0·09 <i>C</i> = 70° 16' 54''·88
	<i>h</i> 54·94	<i>l</i> 55·10	<i>l</i> 55·50	<i>h</i> 53·48	<i>h</i> 54·68	<i>l</i> 56·74	<i>h</i> 54·94	<i>l</i> 54·82	<i>l</i> 55·48	<i>h</i> 53·38	
	<i>h</i> 54·94	<i>l</i> 52·44	<i>l</i> 56·38	<i>h</i> 54·88	<i>l</i> 56·36	<i>l</i> 54·00	<i>h</i> 55·74	<i>l</i> 54·46	<i>l</i> 55·42	<i>l</i> 55·94	
							<i>l</i> 56·10		<i>h</i> 53·10	<i>l</i> 56·06	
	54·90	54·05	55·50	54·21	55·75	54·97	55·66	54·71	53·61	55·45	
XC & XCII	<i>h</i> 6·16	<i>h</i> 6·80	<i>l</i> 6·30	<i>h</i> 6·12	<i>h</i> 5·68	<i>l</i> 6·26	<i>h</i> 4·04	<i>l</i> 8·54	<i>l</i> 5·94	<i>h</i> 4·78	<i>M</i> = 6''·49 <i>w</i> = 11·70 $\frac{1}{w}$ = 0·09 <i>C</i> = 56° 7' 6''·48
	<i>h</i> 4·72	<i>l</i> 7·02	<i>l</i> 6·60	<i>h</i> 6·82	<i>h</i> 5·92	<i>l</i> 7·40	<i>h</i> 6·70	<i>l</i> 6·84	<i>l</i> 4·48	<i>h</i> 7·80	
	<i>h</i> 6·64	<i>l</i> 8·98	<i>l</i> 7·24	<i>h</i> 5·36	<i>h</i> 7·52	<i>l</i> 7·16	<i>l</i> 7·04	<i>l</i> 7·90	<i>h</i> 5·94	<i>l</i> 7·90	
							<i>l</i> 5·58			<i>l</i> 4·66	
	5·84	7·60	6·71	6·10	6·37	6·94	5·84	7·76	5·45	6·29	
At XC											
<i>February 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XCIII & XCIV	<i>l</i> 50·66	<i>h</i> 45·98	<i>l</i> 47·78	<i>l</i> 47·36	<i>l</i> 49·92	<i>h</i> 48·58	<i>l</i> 49·70	<i>h</i> 50·88	<i>h</i> 47·94	<i>l</i> 51·36	<i>M</i> = 49''·03 <i>w</i> = 6·64 $\frac{1}{w}$ = 0·15 <i>C</i> = 59° 22' 49''·01
	<i>l</i> 47·60	<i>h</i> 46·78	<i>l</i> 50·70	<i>l</i> 48·12	<i>l</i> 48·78	<i>h</i> 50·76	<i>l</i> 49·06	<i>h</i> 44·88	<i>l</i> 50·96	<i>l</i> 50·60	
	<i>l</i> 47·96	<i>h</i> 46·62	<i>l</i> 49·24	<i>l</i> 46·34	<i>l</i> 49·18	<i>h</i> 49·22	<i>l</i> 49·68	<i>h</i> 50·60	<i>l</i> 50·32	<i>l</i> 49·94	
	<i>h</i> 47·36	<i>l</i> 48·84	<i>l</i> 48·94					<i>h</i> 50·18	<i>l</i> 50·18		
		<i>l</i> 49·46									
	48·40	47·54	49·17	47·27	49·29	49·52	49·48	49·14	49·85	50·63	

At XC—(Continued.)											
<i>February 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0°1'	180°1'	7°18'	187°18'	14°25'	194°25'	21°37'	201°37'	28°49'	208°49'	
XCIV & XCII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 8''·08 <i>w</i> = 8 ·10 $\frac{1}{w}$ = 0 ·12 <i>C</i> = 55° 57' 8''·08
	l 5·66	h 9·44	l 7·64	l 9·66	l 9·54	h 9·30	l 8·30	h 10·20	h 7·38	l 7·56	
	l 6·86	h 10·96	l 5·10	l 9·20	l 7·22	h 7·12	l 8·70	h 10·30	l 6·56	l 8·22	
	l 8·56	h 8·12	l 7·14	l 7·46	l 7·66	h 7·62	l 9·28	h 8·94	l 5·72	l 8·14	
		l 7·50	l 7·48					h 9·00	l 6·88		
	7·03	9·01	6·84	8·77	8·14	8·01	8·76	9·61	6·64	7·97	
XCII & LXXXIX	l 28·68	h 24·04	l 26·48	l 25·24	l 23·90	l 26·34	l 25·38	h 21·02	h 26·10	l 26·52	<i>M</i> = 25''·20 <i>w</i> = 7 ·12 $\frac{1}{w}$ = 0 ·14 <i>C</i> = 59° 17' 25''·21
	l 25·96	h 24·96	l 26·48	l 25·30	l 26·30	l 25·40	l 23·28	h 24·26	l 22·96	l 25·06	
	l 24·12	h 26·86	l 26·62	l 26·38	l 25·36	l 25·06	l 24·10	h 24·26	l 23·68	l 24·00	
	l 27·08								l 26·02		
	26·46	25·29	26·53	25·64	25·19	25·60	24·25	23·18	24·69	25·19	
LXXXIX & LXXXVIII	l 38·34	h 37·50	l 36·20	l 36·50	l 40·14	l 36·72	l 38·88	h 38·86	h 38·06	l 35·82	<i>M</i> = 38''·09 <i>w</i> = 9 ·70 $\frac{1}{w}$ = 0 ·10 <i>C</i> = 53° 29' 38''·09
	l 38·42	h 36·98	l 38·36	l 36·98	l 39·40	l 38·50	l 39·60	h 39·82	l 39·38	l 38·34	
	l 38·36	h 36·12	l 38·36	l 37·08	l 37·56	l 38·38	l 39·14	h 38·24	l 39·22	l 37·52	
	38·37	36·87	37·64	36·85	39·03	37·87	39·21	38·97	38·89	37·23	
LXXXVIII & XCI	h 14·92	h 15·70	l 14·96	l 16·44	l 14·46	h 17·02	l 15·12	h 16·36	l 18·60	l 14·54	<i>M</i> = 15''·40 <i>w</i> = 10 ·15 $\frac{1}{w}$ = 0 ·10 <i>C</i> = 52° 15' 15''·41
	l 15·70	h 14·38	l 15·90	l 16·94	l 15·34	h 15·06	l 14·00	h 16·44	l 15·58	l 13·08	
	l 16·98	h 15·18	l 14·20	l 17·10	l 14·12	h 14·04	l 15·10	h 14·66	l 15·90	l 14·48	
								l 16·10			
	15·87	15·09	15·02	16·83	14·64	15·37	14·74	15·82	16·55	14·03	
XCI & XCIII	h 42·88	h 44·26	l 44·76	l 42·94	l 44·22	h 40·74	l 44·26	h 44·72	l 42·54	l 44·00	<i>M</i> = 44''·23 <i>w</i> = 11 ·37 $\frac{1}{w}$ = 0 ·09 <i>C</i> = 79° 37' 44''·23
	l 45·04	h 44·80	l 44·74	l 43·62	l 42·68	h 43·40	l 44·80	h 45·14	l 45·48	l 44·90	
	l 43·94	h 43·82	l 47·16	l 43·94	l 43·08	h 42·68	l 43·92	h 45·68	l 45·18	l 45·22	
		l 44·84				l 45·00		l 45·28			
	43·95	44·29	45·38	43·50	43·33	42·96	44·33	45·18	44·62	44·71	

At XCI											
<i>February 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XCIII & XC	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 61''·24 <i>w</i> = 10·57 $\frac{1}{w}$ = 0·09 <i>C</i> = 38° 45' 61''·24
	h60·86	l59·80	l60·40	l60·68	l62·44	h60·12	h62·60	l60·12	l63·98	l59·94	
	h61·20	l59·48	l62·22	l62·24	l62·00	h61·14	h62·52	l61·30	l61·06	l61·72	
	l63·26	l59·46	l61·38	l61·62	l59·94	h60·16	h61·70	l60·62	l62·34	l62·26	
	l59·98										
	61·33	59·58	61·33	61·51	61·46	60·47	62·27	60·68	62·46	61·31	
XC & LXXXVIII	h15·96	l17·08	l19·20	l19·94	l14·98	h17·78	h16·84	l18·50	l19·48	l17·60	<i>M</i> = 17''·53 <i>w</i> = 12·40 $\frac{1}{w}$ = 0·08 <i>C</i> = 58° 42' 17''·51
	h18·00	l17·82	l17·42	l17·10	l17·06	h18·04	h17·18	l16·60	l19·24	l17·98	
	l14·98	l16·82	l16·68	l18·46	l18·16	h17·20	h17·32	l17·80	l17·90	l16·74	
	l16·14				l16·92						
	16·27	17·24	17·77	18·50	16·78	17·67	17·11	17·63	18·87	17·44	
At XCII											
<i>February and March 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on LXXXIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
LXXXIX & XC	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 29''·09 <i>w</i> = 13·76 $\frac{1}{w}$ = 0·07 <i>C</i> = 64° 35' 29''·08
	h30·18	h27·76	l26·26	l29·54	h28·86	l30·48	l31·06	l28·94	h29·20	h29·26	
	h28·54	h29·72	l28·34	l28·74	h29·34	l27·42	l30·60	l28·84	h29·34	h28·92	
	h29·00	h27·56	l27·88	h29·62	l29·56	l29·66	l30·40	l28·46	h29·46	h29·02	
			l28·52								
	29·24	28·35	27·75	29·30	29·25	29·19	30·69	28·75	29·33	29·07	
XC & XCIV	h7·20	h9·82	l10·92	l10·06	h6·94	l9·28	l8·36	l8·76	h5·54	h4·14	<i>M</i> = 7''·82 <i>w</i> = 6·47 $\frac{1}{w}$ = 0·15 <i>C</i> = 81° 38' 7''·82
	h9·10	h8·62	l8·00	l9·06	h5·08	l9·88	l9·34	h7·10	h5·48	h8·28	
	h8·20	h8·86	l9·56	h6·74	l8·34	l9·56	l10·14	h7·58	h4·74	h6·70	
			h8·80	h7·22	l9·18	h8·10	h5·28		h6·76	h7·42	
			l6·44			h5·88	h6·48				
	8·17	9·10	8·74	8·27	7·39	8·54	7·92	7·81	5·63	6·64	

At XCIII

February 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on XCVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 0'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	206° 49'	
XCVI & XCV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 51''·10 <i>w</i> = 14·90 $\frac{1}{w}$ = 0·07 <i>C</i> = 41° 54' 51''·10
	h49°66	l51°68	l51°90	h52°56	l52°38	l52°34	l52°72	l49°76	l51°80	l50°70	
	l50°02	l51°14	l50°04	h51°30	l52°50	l51°50	l51°40	l49°80	l51°58	l51°28	
	l50°98	l49°58	l49°52	h51°04	l51°44	l50°20	l51°64	l50°38	l50°46	l51°76	
	50°22	50°80	50°49	51°63	52°11	51°35	51°92	49°98	51°28	51°25	
XCV & XCVI	h50°32	l50°16	l51°76	h50°50	l50°16	l49°94	l52°14	l51°86	l50°56	l52°28	<i>M</i> = 51''·31 <i>w</i> = 13·33 $\frac{1}{w}$ = 0·08 <i>C</i> = 49° 20' 51''·31
	l50°30	l51°40	l50°92	h51°18	l51°12	l51°48	l53°24	l54°48	l50°26	l52°04	
	l49°94	l51°34	l52°20	h52°48	l50°38	l52°32	l52°74	l50°78	l52°46	l50°38	
								l49°68			
	50°19	50°97	51°63	51°39	50°55	51°25	52°71	51°70	51°09	51°57	
XCIV & XC	l43°14	l42°56	l40°72	l41°90	l40°96	l39°32	l39°12	l42°04	l43°12	l41°42	<i>M</i> = 41''·22 <i>w</i> = 8·71 $\frac{1}{w}$ = 0·11 <i>C</i> = 80° 29' 41''·21
	l42°40	l39°82	l41°16	h41°04	l39°66	l38°44	l40°24	l40°22	l43°64	l40°62	
	l41°66	l42°90	l41°30	h40°22	l41°80	h40°52	l41°42	l41°50	l42°12	l41°66	
		l41°48				l39°26					
						l40°08					
	42°40	41°69	41°06	41°05	40°81	39°52	40°26	41°25	42°96	41°23	
XC & XCI	l14°50	l13°42	l13°82	l15°12	l15°72	l14°22	l14°78	l14°90	l13°82	l14°32	<i>M</i> = 14''·72 <i>w</i> = 9·80 $\frac{1}{w}$ = 0·10 <i>C</i> = 61° 36' 14''·72
	l14°46	l12°44	l13°52	h15°28	l15°44	h16°76	l14°66	l14°82	l13°30	l15°62	
	l16°64	l12°98	l14°92	h16°08	l16°42	h16°36	l13°62	l15°04	l14°00	l14°72	
	15°20	12°95	14°09	15°49	15°86	15°78	14°35	14°92	13°71	14°89	

At XCIV											
<i>February 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	208° 49'	
XCII & XC	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 45".19 <i>w</i> = 6.36 $\frac{1}{w}$ = 0.16 <i>C</i> = 42° 24' 45".17
	l 41° 16'	l 45° 06'	l 46° 02'	l 46° 94'	l 46° 00'	h 47° 06'	l 44° 46'	l 44° 84'	l 42° 08'	l 43° 98'	
	l 45° 18'	l 46° 80'	l 46° 98'	l 45° 06'	h 46° 86'	l 45° 62'	l 42° 38'	l 45° 26'	l 44° 40'	l 44° 00'	
	l 44° 82'	l 45° 52'	l 46° 96'	l 46° 24'	h 45° 54'	l 43° 52'	l 43° 98'	l 44° 58'	l 44° 00'	l 44° 36'	
	l 45° 86'					l 48° 62'	l 44° 84'		l 44° 84'		
	44° 26'	45° 79'	46° 65'	46° 08'	46° 13'	46° 21'	43° 92'	44° 89'	43° 83'	44° 11'	
XC & XCIII	l 31° 42'	l 28° 38'	l 30° 24'	l 27° 70'	l 32° 30'	h 31° 06'	l 30° 70'	l 30° 36'	l 32° 38'	l 29° 60'	<i>M</i> = 30".40 <i>w</i> = 5.93 $\frac{1}{w}$ = 0.17 <i>C</i> = 40° 7' 30".38
	l 31° 66'	l 28° 26'	l 29° 52'	l 28° 66'	l 32° 30'	l 28° 90'	l 31° 86'	l 29° 60'	l 30° 68'	l 30° 00'	
	l 30° 72'	l 29° 22'	l 29° 26'	l 26° 78'	h 30° 92'	l 31° 90'	l 32° 42'	l 29° 62'	l 30° 96'	l 30° 22'	
			l 27° 30'		l 32° 54'		l 29° 02'				
			l 31° 42'								
			l 29° 60'								
			l 30° 72'								
	31° 27'	28° 62'	29° 67'	28° 88'	31° 84'	31° 10'	31° 66'	29° 65'	31° 34'	29° 94'	
XCIII & XCV	l 60° 62'	l 63° 28'	l 60° 98'	h 59° 96'	l 58° 94'	h 59° 28'	l 61° 68'	l 59° 80'	l 59° 84'	l 61° 80'	<i>M</i> = 60".80 <i>w</i> = 5.72 $\frac{1}{w}$ = 0.17 <i>C</i> = 82° 44' 60".80
	l 58° 46'	l 63° 12'	l 61° 22'	h 59° 18'	l 59° 72'	l 59° 94'	l 61° 48'	l 59° 72'	l 61° 62'	l 61° 78'	
	l 59° 10'	l 63° 06'	l 61° 20'	h 59° 42'	h 60° 28'	l 60° 90'	l 61° 44'	l 61° 36'	l 61° 18'	l 63° 52'	
					l 59° 34'		l 61° 02'				
	59° 39'	63° 15'	61° 13'	59° 52'	59° 65'	59° 87'	61° 53'	60° 48'	60° 88'	62° 37'	
XCV & XCVII	l 14° 40'	l 12° 90'	l 14° 06'	h 12° 86'	l 12° 74'	h 13° 78'	l 14° 36'	l 13° 06'	l 15° 02'	l 14° 04'	<i>M</i> = 13".38 <i>w</i> = 10.56 $\frac{1}{w}$ = 0.09 <i>C</i> = 53° 32' 13".37
	l 14° 36'	l 12° 04'	l 13° 56'	h 13° 88'	l 13° 40'	l 13° 38'	l 13° 38'	l 13° 58'	l 14° 46'	l 13° 78'	
	l 14° 38'	l 12° 50'	l 14° 86'	h 13° 60'	h 11° 30'	l 9° 94'	l 13° 02'	l 13° 38'	l 13° 64'	l 13° 14'	
					l 11° 34'						
	14° 38'	12° 48'	14° 16'	13° 45'	12° 48'	11° 86'	13° 59'	13° 34'	14° 37'	13° 65'	

<i>. At XCV</i>											
<i>January 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 48'	208° 49'	
XCVIII & XCIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 51''·17 <i>w</i> = 6·99 $\frac{1}{w}$ = 0·14 <i>C</i> = 53° 28' 51''·17
	l 50° 52	l 53° 16	l 51° 48	l 49° 06	h 48° 14	l 52° 76	l 52° 52	l 52° 70	l 48° 72	h 51° 64	
	l 52° 30	l 50° 22	l 51° 86	l 49° 74	h 48° 20	l 53° 18	l 52° 96	h 50° 16	l 51° 28	h 51° 02	
	l 49° 74	h 50° 58	l 52° 76	l 48° 84	h 54° 46	l 50° 84	l 50° 96	h 50° 86	l 50° 22	l 51° 86	
		h 51° 72			h 52° 18						
					h 51° 76						
	50° 85	51° 42	52° 03	49° 21	50° 95	52° 26	52° 15	51° 24	50° 07	51° 51	
XCIX & XCVII	l 57° 52	l 57° 20	l 56° 94	l 56° 56	h 54° 16	l 54° 58	l 57° 10	h 57° 10	l 57° 40	h 56° 54	<i>M</i> = 56''·67 <i>w</i> = 5·92 $\frac{1}{w}$ = 0·17 <i>C</i> = 74° 50' 56''·67
	l 57° 16	l 60° 24	l 55° 10	l 58° 04	h 55° 58	l 55° 04	l 56° 94	h 57° 58	l 57° 20	h 57° 42	
	l 57° 84	h 56° 66	l 52° 42	l 54° 88	l 54° 66	l 56° 58	l 57° 56	l 57° 02	l 57° 16	l 58° 48	
		h 57° 90	l 56° 06	l 55° 48				l 58° 94			
	57° 51	58° 00	55° 13	56° 24	54° 80	55° 40	57° 20	57° 66	57° 25	57° 48	
XCVII & XCIV	l 44° 42	l 44° 12	l 44° 38	l 43° 94	h 46° 06	l 43° 50	l 47° 28	h 47° 82	l 45° 74	h 45° 18	<i>M</i> = 45''·39 <i>w</i> = 7·75 $\frac{1}{w}$ = 0·13 <i>C</i> = 65° 48' 45''·39
	l 44° 28	l 42° 86	l 48° 00	l 43° 40	h 45° 78	l 45° 14	l 47° 70	l 45° 74	l 45° 90	h 45° 24	
	l 43° 34	h 45° 60	l 46° 80	l 45° 68	l 47° 56	l 44° 74	l 45° 24	l 43° 76	l 45° 56	h 45° 80	
		h 45° 32	l 46° 08					l 46° 22			
	44° 01	44° 48	46° 32	44° 34	46° 47	44° 46	46° 74	45° 89	45° 73	45° 41	
XCIV & XCIII	l 6° 18	l 7° 74	l 10° 06	l 8° 92	h 8° 82	l 7° 62	l 5° 20	h 8° 20	l 10° 50	h 7° 14	<i>M</i> = 8''·35 <i>w</i> = 10·42 $\frac{1}{w}$ = 0·10 <i>C</i> = 47° 54' 8''·36
	l 7° 54	l 7° 62	l 7° 04	l 9° 00	h 11° 22	l 7° 40	l 6° 06	l 7° 62	l 8° 44	h 7° 98	
	l 8° 98	l 10° 96	l 10° 24	l 8° 36	l 8° 24	l 10° 68	l 7° 98	l 9° 78	l 6° 94	l 7° 12	
		l 8° 68	l 9° 52		l 8° 08	l 7° 86	l 8° 88		l 9° 14		
	7° 57	8° 75	9° 22	8° 76	9° 09	8° 39	7° 03	8° 53	8° 76	7° 41	
XCIII & XCVI	l 51° 82	l 49° 12	l 49° 12	l 48° 38	h 48° 32	l 50° 32	l 49° 18	h 49° 02	l 47° 32	h 47° 08	<i>M</i> = 48''·96 <i>w</i> = 9·74 $\frac{1}{w}$ = 0·10 <i>C</i> = 63° 45' 48''·97
	l 52° 14	l 49° 44	l 48° 80	l 46° 62	h 46° 34	l 50° 80	l 49° 42	l 48° 98	l 49° 06	h 50° 00	
	l 48° 96	l 46° 62	l 48° 04	l 50° 44	l 48° 80	l 47° 98	l 47° 52	l 48° 28	l 49° 22	l 48° 36	
	l 50° 28	l 49° 68		l 51° 52	l 48° 58						
	50° 80	48° 72	48° 65	49° 24	48° 01	49° 70	48° 71	48° 76	48° 53	48° 48	

At XCV—(Continued.)											
January 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on XCVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XCVI & XCVIII	"	"	"	"	"	"	"	"	"	"	M = 29'' 50 w = 6 '95 $\frac{1}{w}$ = 0 '14 C = 54° 11' 29'' 49
	l 28' 92	l 29' 16	l 27' 98	l 31' 48	h 28' 78	l 27' 62	l 28' 56	h 29' 24	l 30' 68	h 28' 64	
	l 29' 30	l 29' 50	l 26' 12	l 33' 42	h 29' 20	l 28' 98	l 28' 10	h 28' 62	l 30' 26	h 29' 82	
	l 31' 12	h 29' 98	l 26' 36	l 30' 64	h 30' 18	l 29' 22	l 30' 50	h 27' 96	l 30' 40	h 29' 74	
			l 31' 48							l 28' 10	
			l 31' 20								
	29' 78	29' 55	28' 63	31' 85	29' 39	28' 61	29' 05	28' 61	30' 45	29' 08	
At XCVI											
January 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on XCVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 28'	21° 37'	201° 37'	28° 49'	206° 49'	
XCVIII & XCV	"	"	"	"	"	"	"	"	"	"	M = 12'' 40 w = 8 '48 $\frac{1}{w}$ = 0 '12 C = 73° 7' 12'' 39
	h 10' 92	h 12' 74	l 13' 62	l 12' 12	h 14' 06	l 12' 64	l 11' 66	l 10' 24	l 13' 30	l 12' 40	
	h 11' 08	h 13' 54	l 12' 60	l 9' 10	l 12' 48	l 12' 68	l 12' 64	l 10' 62	l 12' 94	l 12' 66	
	h 11' 24	l 12' 62	l 13' 00	l 13' 56	l 12' 66	l 12' 14	l 14' 48	l 9' 88	l 14' 56	l 12' 80	
				l 10' 72				l 12' 22			
	11' 08	12' 97	13' 07	11' 38	13' 07	12' 49	12' 93	10' 74	13' 60	12' 62	
XCV & XCVI	h 20' 28	h 20' 24	l 18' 38	l 20' 64	h 20' 64	l 21' 88	l 20' 70	l 20' 66	l 22' 86	l 20' 46	M = 20'' 70 w = 7 '50 $\frac{1}{w}$ = 0 '13 C = 74° 19' 20'' 69
	h 19' 84	l 20' 20	l 18' 66	l 21' 18	l 19' 70	l 22' 30	l 21' 76	l 21' 90	l 22' 10	l 20' 06	
	h 21' 18	l 21' 72	l 17' 58	l 17' 30	l 19' 80	l 22' 74	l 21' 96	l 22' 44	l 21' 16	l 20' 34	
		l 19' 54	l 20' 06		l 20' 34			l 22' 12			
		l 19' 06									
	20' 43	20' 72	18' 64	19' 80	20' 05	21' 82	21' 47	21' 67	22' 06	20' 29	

At XCVII											
<i>February 1860, observed by Lieutenants J. P. Basevi and J. Herschel with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XCIV & XCV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 2''·42 <i>w</i> = 20·40 $\frac{1}{w}$ = 0·05 <i>C</i> = 60° 39' 2''·42
	h 2'74	l 3'28	l 2'02	l 2'68	l 3'16	l 0'86	h 1'10	l 1'10	l 2'46	l 2'10	
	h 1'44	l 3'66	l 3'24	l 3'22	l 2'42	l 1'70	h 3'18	l 1'98	l 4'36	l 3'16	
	l 2'30	l 2'34	l 2'90	l 4'00	l 0'66	l 3'10	l 2'80	l 2'46	l 1'38	l 0'86	
	2'16	3'09	2'72	3'30	2'08	1'89	2'36	1'85	2'73	2'04	
XCV & XCIX	l 49'68	l 47'56	h 48'68	h 48'30	l 50'04	l 50'24	h 48'56	l 49'30	l 49'54	l 47'88	<i>M</i> = 48''·77 <i>w</i> = 18·20 $\frac{1}{w}$ = 0·05 <i>C</i> = 56° 31' 48''·77
	l 49'82	l 48'76	h 47'88	h 48'12	l 47'90	l 47'32	h 48'56	l 47'92	l 48'62	l 47'74	
	l 49'38	l 50'18	h 48'40	h 46'80	l 50'24	l 49'72	l 50'02	l 47'78	l 48'92	l 49'22	
	49'63	48'83	48'32	47'74	49'39	49'09	49'05	48'33	49'03	48'28	
At XCVIII											
<i>January 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
CI & C	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 31''·64 <i>w</i> = 12·70 $\frac{1}{w}$ = 0·08 <i>C</i> = 59° 0' 31''·65
	h 32'38	l 31'66	l 30'32	l 31'72	l 31'90	l 32'56	h 33'34	h 32'96	l 30'60	l 32'74	
	h 31'50	l 31'50	l 29'94	l 31'90	l 32'30	l 32'44	h 34'00	h 30'68	l 30'28	l 30'16	
	h 31'28	l 32'32	l 29'54	l 32'50	l 30'98	l 32'46	h 32'18	h 30'96	l 31'30	l 33'26	
							h 31'30			l 31'46	
							h 31'78				
	31'72	31'83	29'93	32'04	31'73	32'49	32'52	31'53	30'73	31'91	
C & XCIX	h 10'64	l 11'04	l 10'78	l 9'72	l 13'04	l 13'08	h 10'68	h 11'78	l 11'80	l 12'12	<i>M</i> = 11''·64 <i>w</i> = 12·86 $\frac{1}{w}$ = 0·08 <i>C</i> = 61° 6' 11''·65
	h 11'80	l 11'64	l 11'82	l 10'02	l 11'54	l 13'12	h 12'00	h 12'72	l 11'90	l 11'60	
	h 11'12	l 10'28	l 11'70	l 10'54	l 12'66	l 14'02	h 13'46	h 13'28	l 12'20	l 10'98	
						l 10'20	h 11'98				
						l 9'98					
	11'19	10'99	11'43	10'09	12'41	12'08	12'03	12'59	11'97	11'57	



At XCVIII—(Continued.)											
<i>January 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
XCLX & XCV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 56".39 <i>w</i> = 7.75 $\frac{1}{w}$ = 0.13 <i>C</i> = 59° 43' 56".38
	l 55.16	l 55.84	l 57.84	h 55.26	h 56.64	l 53.56	h 54.88	h 57.48	l 56.82	l 54.88	
	l 58.76	l 57.16	l 59.74	h 56.10	l 57.48	l 54.04	h 56.50	h 56.52	l 56.70	l 55.30	
	l 57.26	l 58.06	l 57.32	h 56.28	l 55.60	l 51.80	h 55.46	h 55.96	l 56.70	l 55.54	
	l 58.52		h 55.88			l 57.66	h 55.54				
						l 58.36					
	57.43	57.02	57.70	55.88	56.57	55.08	55.60	56.65	56.74	55.24	
XCV & XCVI	h 18.04	l 18.48	l 17.64	h 19.50	l 17.54	l 16.66	h 23.30	h 18.32	l 18.94	l 19.30	<i>M</i> = 18".54 <i>w</i> = 9.34 $\frac{1}{w}$ = 0.11 <i>C</i> = 52° 41' 18".55
	l 17.90	l 19.12	l 17.14	h 18.64	l 17.56	l 17.70	h 19.66	h 18.58	l 19.74	l 19.60	
	l 17.74	l 18.08	l 17.86	h 19.00	l 17.82	l 17.88	h 17.76	h 18.44	l 18.78	l 19.32	
							h 20.32				
	17.89	18.56	17.55	19.05	17.64	17.41	20.26	18.45	19.15	19.41	
At XCIX											
<i>January 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XCVII & XCV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 15".22 <i>w</i> = 5.17 $\frac{1}{w}$ = 0.19 <i>C</i> = 48° 37' 15".22
	h 17.18	h 14.52	l 13.22	l 18.32	l 14.26	l 12.08	l 14.24	l 15.90	l 12.58	l 17.10	
	h 16.72	h 14.78	l 13.16	l 18.32	l 15.80	l 14.88	l 15.86	l 15.46	l 14.04	l 16.28	
	h 15.48	h 15.62	l 14.32	l 17.00	l 13.50	l 14.54	l 14.84	l 15.54	l 14.02	l 15.96	
			l 15.56	l 17.04					l 15.16		
			l 12.54								
	16.46	14.97	13.76	17.67	14.52	13.83	14.98	15.63	13.95	16.45	

AtXCIX—(Continued.)											
<i>January 1860, observed by Lieutenants J. P. Basevi, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
XCV & XCVIII	"	"	"	"	"	"	"	"	"	"	M = 13''·21 w = 12·80 $\frac{1}{w}$ = 0·08 C = 66° 47' 13''·21
	l 14·32	l 11·04	l 12·18	l 13·32	l 13·34	l 12·24	l 13·58	l 13·56	l 15·42	l 13·12	
	l 13·82	h 12·16	l 12·84	l 12·52	l 12·36	l 11·02	l 12·50	l 13·22	l 14·12	l 13·32	
	l 14·52	h 12·58	l 14·76	l 12·64	l 13·64	l 12·84	l 13·88	l 13·46	l 13·70	l 14·32	
	14·22	11·93	13·26	12·83	13·11	12·03	13·32	13·41	14·41	13·59	
XCVIII & C	l 19·10	l 22·54	l 21·96	l 19·18	l 21·56	l 18·86	l 18·16	l 18·66	l 18·16	l 18·16	M = 19''·42 w = 8·10 $\frac{1}{w}$ = 0·12 C = 59° 57' 19''·43
	l 21·56	l 19·14	l 21·56	l 20·88	l 20·62	l 20·86	l 18·96	l 18·42	l 19·66	l 18·64	
	l 18·88	l 19·70	l 19·10	l 18·38	l 20·16	l 17·90	l 18·96	l 18·02	l 19·28	l 17·34	
	l 18·26	l 19·72									
	19·45	20·28	20·87	19·48	20·78	19·21	18·69	18·37	19·03	18·05	
C & CII	h 49·98	l 47·28	l 47·92	l 48·76	l 46·94	l 49·52	l 50·24	l 48·76	l 51·60	l 48·12	M = 49''·06 w = 6·62 $\frac{1}{w}$ = 0·15 C = 51° 30' 49''·06
	l 51·40	l 49·38	l 47·88	l 49·60	l 47·94	l 51·36	l 49·38	l 47·54	l 50·36	l 48·06	
	l 49·34	l 50·62	l 48·68	l 47·32	l 46·38	l 49·66	l 48·98	l 48·74	l 49·88	l 48·76	
		l 51·08									
	50·24	49·59	48·16	48·36	47·09	50·18	49·53	48·35	50·61	48·31	
At C											
<i>January 1860, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
CIII & CIV.	"	"	"	"	"	"	"	"	"	"	M = 17''·49 w = 6·58 $\frac{1}{w}$ = 0·15 C = 64° 49' 17''·50
	h 18·16	l 19·40	l 18·60	l 18·40	h 19·50	l 18·08	l 18·52	l 14·74	l 15·54	l 17·80	
	h 19·52	l 16·74	l 18·02	l 16·08	h 18·08	l 17·96	l 16·42	h 16·60	l 16·14	h 20·36	
	l 20·50	l 17·06	l 18·64	l 15·88	h 17·70	l 18·96	l 16·28	h 18·10	l 14·86	h 19·74	
	l 15·90			l 16·16	h 18·24			h 15·54		h 16·26	
										h 16·04	
	18·52	17·73	18·42	16·63	18·38	18·33	17·07	16·25	15·51	18·04	

<i>At C—(Continued.)</i>											
<i>January 1860, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CIV & CII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 54''·22 <i>w</i> = 6·86 $\frac{1}{w}$ = 0·15 <i>C</i> = 48° 58' 54''·19
	h 54'·74	l 51'·20	l 53'·70	l 52'·52	h 53'·30	l 55'·98	l 52'·92	l 56'·00	l 54'·82	l 55'·30	
	h 53'·10	l 50'·52	l 53'·24	l 55'·08	h 53'·72	l 54'·54	l 52'·18	h 55'·28	l 54'·36	h 54'·24	
	l 51'·44	l 50'·76	l 53'·04	l 55'·86	h 55'·20	l 55'·84	l 55'·26	h 55'·88	l 55'·90	h 53'·48	
	l 52'·08	l 54'·96		l 55'·46	h 54'·04		l 55'·00			h 54'·64	
	l 54'·04	l 55'·10									
	53'·08	52'·51	53'·33	54'·73	54'·07	55'·45	53'·84	55'·72	55'·03	54'·42	
CII & XCIX	h 45'·96	l 46'·04	l 46'·30	l 49'·16	l 47'·02	h 46'·37	l 47'·12	l 45'·26	l 50'·50	l 46'·50	<i>M</i> = 46''·51 <i>w</i> = 10·27 $\frac{1}{w}$ = 0·10 <i>C</i> = 70° 27' 46''·53
	h 47'·36	l 46'·32	l 46'·94	l 46'·74	l 46'·10	l 47'·14	l 46'·92	h 44'·94	l 46'·26	l 45'·98	
	l 47'·54	l 48'·16	l 46'·22	l 45'·90	l 46'·26	l 46'·24	l 46'·70	h 43'·46	l 47'·32	h 44'·80	
	l 47'·52			l 45'·36					l 46'·22		
	47'·10	46'·84	46'·49	46'·79	46'·46	46'·58	46'·91	44'·55	47'·58	45'·76	
XCIX & XCVIII	l 29'·28	l 27'·54	l 28'·22	l 24'·04	l 28'·04	l 27'·76	l 29'·42	l 31'·60	l 26'·96	l 27'·46	<i>M</i> = 28''·50 <i>w</i> = 6·19 $\frac{1}{w}$ = 0·16 <i>C</i> = 58° 56' 28''·50
	l 29'·04	l 27'·70	l 28'·70	l 26'·06	l 29'·28	l 27'·18	l 28'·58	h 30'·30	l 27'·60	l 26'·66	
	l 27'·98	l 29'·42	l 29'·92	l 28'·02	l 29'·40	l 27'·52	l 29'·12	h 31'·32	l 30'·10	h 28'·66	
				l 28'·74				h 30'·78	l 28'·44		
	28'·77	28'·22	28'·95	26'·72	28'·91	27'·49	29'·04	31'·00	28'·28	27'·59	
XCVIII & CI	l 35'·82	l 34'·12	l 35'·86	l 39'·16	l 36'·56	l 39'·40	l 35'·28	l 34'·72	l 36'·44	l 36'·20	<i>M</i> = 36''·45 <i>w</i> = 10·78 $\frac{1}{w}$ = 0·09 <i>C</i> = 55° 31' 36''·46
	l 36'·48	l 35'·38	l 36'·02	h 36'·76	l 36'·70	l 36'·76	l 38'·02	h 35'·64	l 36'·80	l 38'·60	
	l 38'·32	l 36'·14	l 35'·28	h 36'·28	l 36'·76	l 37'·30	l 36'·16	h 35'·70	l 36'·20	h 37'·14	
				h 36'·02						h 35'·40	
	36'·87	35'·21	35'·72	37'·06	36'·67	37'·82	36'·49	35'·35	36'·48	36'·84	
CI & CIII	h 56'·12	l 60'·14	l 57'·46	l 55'·88	l 55'·88	l 53'·12	l 58'·96	l 55'·56	l 57'·80	l 58'·62	<i>M</i> = 56''·56 <i>w</i> = 5·39 $\frac{1}{w}$ = 0·19 <i>C</i> = 61° 15' 56''·56
	l 55'·22	l 59'·92	l 56'·66	h 58'·26	l 54'·64	l 54'·82	l 56'·14	h 56'·92	l 57'·36	l 54'·70	
	l 54'·58	l 57'·96	l 57'·14	h 57'·14	l 54'·06	l 56'·34	l 56'·94	h 56'·40	l 55'·96	h 57'·06	
		l 56'·76				l 54'·98				h 57'·66	
	55'·31'	58'·70	57'·09	57'·09	54'·86	54'·82	57'·35	56'·29	57'·04	57'·01	

At CI											
<i>January 1860, observed by Lieutenants J. P. Basei, J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CIII & C	"	"	"	"	"	"	"	"	"	"	M = 34'' <sup>02</sup> w = 16 '90 $\frac{1}{w}$ = 0 '06 C = 65° 18' 34'' <sup>02</sup>
	h32°98	h34°70	l33°94	l33°98	l35°84	l33°40	l33°94	l34°84	h35°36	h33°26	
	h33°74	h33°68	l34°50	l32°14	l34°42	l34°50	l33°78	h33°94	h35°92	h33°46	
	h33°36	h33°14	l33°38	l33°94	l34°46	l33°46	l33°94	h33°26	h35°48	h33°74	
	33°36	33°84	33°94	33°35	34°91	33°79	33°89	34°01	35°59	33°49	
C & XCVIII	h54°38	h53°20	l53°74	l53°28	l53°26	l55°94	l52°54	l56°04	h53°56	h53°28	M = 53'' <sup>74</sup> w = 10 '40 $\frac{1}{w}$ = 0 '10 C = 65° 27' 53'' <sup>74</sup>
	h54°64	h54°08	l53°42	l53°52	l53°06	l53°76	l53°34	h54°58	h52°64	h54°12	
	h54°72	h53°36	l53°30	l51°38	l52°54	l56°06	l54°10	h54°72	h52°56	h53°00	
	54°58	53°55	53°49	52°73	52°95	55°25	53°33	55°11	52°92	53°47	
At CII											
<i>November 1859, observed by Lieutenant J. P. Basei with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on XCIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
XCIX & C	"	"	"	"	"	"	"	"	"	"	M = 24'' <sup>13</sup> w = 9 '14 $\frac{1}{w}$ = 0 '11 C = 58° 1' 24'' <sup>13</sup>
	l23°94	l22°90	l23°86	l26°10	l25°44	h23°44	l24°62	l23°18	l22°30	l21°82	
	l25°14	l22°62	l24°06	l25°02	h24°84	l25°42	l24°70	l21°96	l23°78	l24°90	
	l24°46	l25°16	l25°24	l25°96	h25°08	l23°56	l25°00	l23°58	l22°64	l22°10	
	24°51	23°56	24°39	25°69	25°12	24°14	24°77	22°91	22°91	23°32	
C & CIV	l33°18	l34°06	l34°16	l32°64	l32°62	h36°64	l34°92	l32°56	l34°86	l34°00	M = 33'' <sup>88</sup> w = 10 '56 $\frac{1}{w}$ = 0 '09 C = 80° 55' 33'' <sup>90</sup>
	l33°98	l34°16	l34°30	l32°50	h35°80	l33°46	l33°46	l33°18	l33°62	l33°30	
	l35°66	l33°78	l32°08	l32°60	h36°14	l35°84	l32°98	l33°06	l32°40	l34°26	
				h35°96	l34°66						
	34°27	34°00	33°51	32°58	35°13	35°15	33°79	32°93	33°63	33°85	

At CIII											
<i>December 1859 and January 1860, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CVI & CV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 60".49 <i>w</i> = 9.42 $\frac{1}{w}$ = 0.11 <i>C</i> = 65° 55' 60".48
	l 60° 90	l 59° 60	h 57° 38	l 60° 32	l 60° 96	l 61° 74	l 61° 92	h 60° 90	l 60° 86	l 58° 78	
	l 61° 78	l 61° 24	h 61° 40	l 60° 84	l 60° 70	l 62° 32	l 61° 90	h 59° 36	l 59° 88	l 59° 06	
	l 61° 24	h 58° 26	l 60° 44	l 60° 58	l 61° 38	l 60° 96	l 61° 12	h 58° 24	l 59° 36	l 59° 90	
		h 59° 28	l 61° 78								
	61° 31	59° 60	60° 25	60° 58	61° 01	61° 67	61° 65	59° 50	60° 03	59° 25	
CV & CIV	d 49° 22	l 48° 16	h 47° 36	l 48° 92	h 46° 06	l 47° 50	l 47° 72	l 48° 24	l 47° 98	l 49° 66	<i>M</i> = 47".78 <i>w</i> = 14.57 $\frac{1}{w}$ = 0.07 <i>C</i> = 45° 6' 47".78
	l 48° 32	l 47° 76	l 48° 30	l 48° 62	l 46° 26	l 47° 96	l 46° 18	h 48° 52	l 47° 16	l 48° 66	
	l 46° 86	h 47° 54	l 47° 28	l 48° 36	l 47° 04	l 48° 70	l 46° 54	h 48° 76	l 46° 88	l 47° 86	
	l 46° 64										
	47° 76	47° 82	47° 65	48° 63	46° 45	48° 05	46° 81	48° 51	47° 34	48° 73	
CIV & C	d 34° 97	l 32° 66	h 34° 46	h 32° 42	h 33° 98	l 32° 54	l 33° 86	l 31° 86	h 34° 46	l 32° 76	<i>M</i> = 33".13 <i>w</i> = 10.66 $\frac{1}{w}$ = 0.09 <i>C</i> = 62° 57' 33".13
	l 34° 56	l 33° 22	h 33° 84	l 32° 06	l 34° 48	l 32° 04	l 34° 66	h 30° 38	h 34° 08	l 34° 24	
	l 32° 08	h 32° 18	h 33° 64	l 31° 38	l 33° 30	l 33° 52	l 33° 88	h 31° 96	l 33° 38	l 33° 94	
	l 32° 42			l 33° 48			h 31° 04	h 32° 22			
	33° 51	32° 69	33° 98	32° 34	33° 92	32° 70	33° 13	31° 40	33° 97	33° 65	
C & CI	h 28° 10	l 27° 60	h 28° 84	h 32° 14	l 33° 60	l 30° 66	l 25° 76	l 27° 30	h 28° 40	l 28° 32	<i>M</i> = 28".72 <i>w</i> = 8.17 $\frac{1}{w}$ = 0.12 <i>C</i> = 53° 25' 28".72
	l 29° 54	l 27° 00	h 28° 00	l 28° 14	l 31° 36	l 29° 58	l 25° 96	h 29° 58	h 29° 94	l 27° 44	
	l 27° 40	h 30° 24	h 29° 16	l 28° 30	l 29° 22	l 28° 86	l 24° 62	h 29° 02	l 28° 18	l 27° 70	
	l 29° 38	h 30° 06		l 27° 64	l 27° 30		h 30° 36				
				l 27° 36			h 30° 26				
	28° 61	28° 73	28° 67	29° 06	29° 77	29° 70	27° 39	28° 63	28° 84	27° 82	

At CIV											
<i>November 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CII & C	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 32" 17 <i>w</i> = 4 62 $\frac{1}{w}$ = 0 22 <i>C</i> = 50° 5' 32" 19
	h 29° 76 l 30° 26 l 30° 60	l 32° 14 l 30° 06 l 32° 04	h 33° 50 h 32° 18 h 28° 88 h 30° 76	h 32° 76 h 33° 54 l 28° 48 l 30° 86	l 33° 04 l 29° 68 l 29° 84 l 30° 02	l 33° 74 l 32° 52 l 32° 74	h 34° 54 h 35° 74 l 32° 90 l 33° 50 l 32° 68	l 35° 02 l 33° 12 l 32° 36 l 32° 62	l 33° 80 h 33° 02 h 32° 04 h 31° 44 l 33° 82	l 34° 96 l 34° 22 h 33° 64	
	30° 21	31° 41	31° 33	31° 41	30° 65	33° 00	33° 87	33° 28	32° 95	33° 62	
C & CIII	l 9° 70 l 8° 52 l 11° 08 l 8° 28	l 11° 52 l 11° 14 l 9° 26	h 12° 34 h 10° 66 h 12° 52	h 8° 34 h 8° 56 l 9° 52 l 9° 76	l 12° 08 l 12° 38 l 11° 60	l 12° 10 l 13° 82 l 13° 10	h 11° 02 h 9° 06 l 10° 56	l 7° 64 l 9° 06 l 11° 22 h 11° 22	l 8° 76 h 12° 60 h 13° 02 h 10° 18	l 10° 22 l 10° 28 l 10° 94	<i>M</i> = 10" 76 <i>w</i> = 5 28 $\frac{1}{w}$ = 0 19 <i>C</i> = 52° 13' 10" 75
		9° 40	10° 64	11° 84	9° 05	12° 02	13° 01	10° 21	9° 79	11° 14	
CIII & CV	l 58° 78 l 57° 12 l 58° 82 l 56° 36 l 57° 74	l 54° 58 l 58° 28 l 55° 94 l 55° 92 l 56° 42	h 54° 66 h 53° 88 h 52° 78 l 54° 36 l 56° 42	h 57° 24 h 55° 60 l 57° 80 l 55° 02	l 57° 02 l 55° 26 l 54° 56 l 55° 02	l 55° 82 l 53° 88 l 54° 38	h 54° 14 h 52° 86 h 53° 56	h 51° 44 h 53° 26 h 55° 76 h 52° 54 l 57° 60	l 52° 84 l 52° 60 l 53° 82 h 50° 80 h 51° 98 h 52° 78 l 56° 34 l 53° 80	l 56° 28 l 57° 86 l 53° 82 l 54° 68	<i>M</i> = 55" 15 <i>w</i> = 4 00 $\frac{1}{w}$ = 0 25 <i>C</i> = 64° 12' 55" 14
		57° 76	56° 18	54° 42	56° 42	55° 61	54° 69	53° 52	54° 12	53° 12	
CV & CVII	l 30° 70 l 28° 94 l 29° 44	l 31° 46 l 28° 94 l 30° 28	h 30° 50 h 30° 48 h 30° 44	h 29° 48 h 29° 86 l 29° 36	l 26° 62 l 28° 86 l 30° 08 l 29° 64	l 28° 74 l 28° 38 l 28° 20	h 29° 02 h 28° 94 h 30° 42	h 29° 94 h 29° 08 h 28° 12	l 30° 46 l 31° 12 l 30° 44	l 27° 90 l 27° 88 l 29° 02	<i>M</i> = 29" 47 <i>w</i> = 11 55 $\frac{1}{w}$ = 0 09 <i>C</i> = 56° 22' 29" 47
		29° 69	30° 23	30° 47	29° 57	28° 80	28° 44	29° 46	29° 05	30° 67	

At CV											
<i>November and December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
CVII & CIV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 5".01 <i>w</i> = 13.47 $\frac{1}{w}$ = 0.07 <i>C</i> = 60° 5' 5".00
	h 3.52 l 5.62 l 4.14	l 5.60 l 7.02 l 5.78	l 3.58 l 4.00 l 4.76	l 5.74 l 4.06 l 5.80	l 4.94 l 4.84 l 5.20	l 7.72 l 6.32 l 4.80	l 4.44 l 5.32 h 4.32	h 5.98 h 4.78 h 4.08	l 3.74 l 3.56 l 4.10	d 5.39 l 5.98 l 6.02 l 5.42 l 4.18	
	4.43	6.13	4.11	5.20	4.99	6.28	4.41	4.95	4.20	5.40	
CIV & CIII	l 17.10 l 18.32 l 17.66	l 19.06 l 20.64 l 20.82 h 18.24	l 19.62 l 18.70 l 16.94	l 16.44 l 16.60 l 18.10	l 19.56 l 20.40 l 17.64	l 19.56 l 16.36 l 18.56 l 19.74	d 21.10 h 18.94 h 18.74 h 19.06	l 22.38 l 17.24 l 19.34 l 17.32	l 19.64 l 20.22 l 22.14 l 17.50 l 19.74	l 16.42 l 15.36 l 16.80 l 17.12	<i>M</i> = 18".54 <i>w</i> = 5.67 $\frac{1}{w}$ = 0.18 <i>C</i> = 70° 40' 18".56
		17.69	19.69	18.42	17.05	19.20	18.56	19.46	19.07	19.85	
CIII & CVI	l 4.86 l 4.72 l 4.68	l 1.24 l 3.50 h 4.14	l 4.90 l 2.84 l 3.92	l 1.46 l 6.68 l 1.84 h 0.06 h 0.04 l 2.30	l 2.22 l 3.30 l 5.14	l 3.72 l 0.74 l 2.08 l 4.30	d 4.81 h 2.68 h 2.66 h 2.52	l 1.66 l 3.96 l 0.54 l 3.22	l 1.68 l 6.38 l 2.82 l 4.46	l 4.56 l 4.94 l 2.60	<i>M</i> = 3".28 <i>w</i> = 7.57 $\frac{1}{w}$ = 0.13 <i>C</i> = 52° 17' 3".22
		4.75	2.48	3.89	2.06	3.55	2.71	3.17	2.35	3.84	
CVI & CIX	l 46.44 l 46.88 l 49.50 l 48.20	l 49.80 l 48.18 l 49.40 l 48.54	h 48.84 l 48.34 l 48.54	l 49.26 l 48.84 l 49.34	l 49.58 l 48.04 l 46.40 l 49.68	l 44.76 l 50.42 l 48.56 l 52.48 l 46.76	l 47.64 l 49.06 h 46.78	h 46.54 h 47.76 h 47.68	l 50.30 l 48.14 l 47.22 l 46.18	l 48.00 l 49.48 l 49.42	<i>M</i> = 48".37 <i>w</i> = 10.57 $\frac{1}{w}$ = 0.09 <i>C</i> = 62° 43' 48".36
		47.76	49.13	48.57	49.15	48.43	48.60	47.83	47.33	47.96	

At CV—(Continued.)											
<i>November and December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 13'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
CIX & CVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 8''·76  <i>w</i> = 9·13 $\frac{1}{w}$ = 0·11 <i>C</i> = 58° 9' 8''·74
	l 11'·04 l 9'·96 l 7'·00 l 8'·74	l 10'·14 l 10'·50 l 7'·18 h 8'·58	h 10'·24 l 11'·12 l 10'·22 h 8'·20	l 10'·26 l 9'·46 h 8'·20 l 8'·88	l 4'·62 l 7'·96 l 10'·54 l 8'·88 l 8'·58	l 11'·96 l 6'·98 l 9'·34 l 6'·18 l 7'·94	l 7'·86 l 7'·62 l 8'·34 h 8'·32	h 8'·22 h 8'·52 h 8'·32	l 8'·46' l 8'·60 l 8'·10 l 8'·06	d 8'·84 l 8'·88 l 6'·84 l 8'·06	
	9'·19	9'·10	10'·53	9'·31	8'·12	8'·48	7'·94	8'·35	8'·39	8'·16	
CVIII & CVII	l 34'·50	l 35'·00	l 36'·38	l 35'·94	l 38'·26	l 37'·54	l 36'·90	h 35'·96	l 35'·20	d 37'·57	<i>M</i> = 36''·38  <i>w</i> = 13·06 $\frac{1}{w}$ = 0·08 <i>C</i> = 56° 4' 36''·39
	l 35'·36 l 36'·42 h 37'·46	l 37'·02 l 38'·50 h 38'·26	l 36'·40 l 35'·82	l 34'·12 h 36'·46	l 37'·38 l 35'·56 l 36'·32	l 36'·92 l 35'·12	l 37'·34 l 35'·74	h 37'·70 h 36'·94	l 34'·32 l 35'·82	l 34'·68 l 37'·82 l 37'·48	
	35'·94	37'·20	36'·20	35'·51	36'·88	36'·53	36'·66	36'·87	35'·11	36'·89	
At CVI											
<i>December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 48'	
CX & CIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 44''·15  <i>w</i> = 8·96 $\frac{1}{w}$ = 0·11 <i>C</i> = 64° 23' 44''·17
	l 45'·08 l 43'·02 l 42'·18 l 44'·34 l 44'·34	l 44'·16 l 42'·10 l 42'·52 l 44'·34	l 44'·52 l 44'·54 l 43'·96	l 49'·22 l 45'·92 l 45'·42 l 44'·36 l 43'·12	l 43'·24 l 42'·82 l 43'·24 l 44'·36 l 43'·12	l 45'·98 l 44'·60 l 44'·14	l 44'·00 l 44'·96 l 43'·50	l 45'·30 h 42'·80 l 42'·26 l 42'·62	l 46'·14 l 43'·38 l 44'·72 l 44'·68	l 45'·36 l 44'·70 l 43'·86	
	43'·79	42'·93	44'·34	45'·61	43'·10	44'·91	44'·15	43'·25	44'·73	44'·64	



At CVI—(Continued.)											
<i>December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 48'	208° 48'	
CIX & CV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 24" 40 <i>w</i> = 8.72 $\frac{1}{w}$ = 0.11 <i>C</i> = 49° 1' 24" 40
	l 22° 08'	l 21° 72'	l 24° 34'	l 22° 78'	l 23° 68'	l 24° 48'	l 21° 48'	l 22° 44'	l 24° 48'	l 23° 88'	
	l 23° 22'	l 21° 00'	l 23° 84'	l 23° 44'	l 24° 70'	l 25° 00'	l 22° 74'	h 25° 74'	l 24° 50'	l 23° 98'	
	l 22° 86'	l 22° 94'	l 24° 12'	l 22° 56'	l 24° 68'	l 24° 26'	l 22° 78'	h 26° 36'	l 26° 44'	l 24° 42'	
	l 25° 55'	l 26° 54'		l 25° 88'			h 27° 38'	l 28° 44'	l 26° 10'		
	l 27° 18'	l 25° 14'		l 24° 72'			h 25° 64'	l 26° 84'			
	24° 18'	23° 47'	24° 10'	23° 88'	24° 35'	24° 58'	24° 00'	25° 96'	25° 38'	24° 09'	
CV & CIII	l 58° 80'	l 59° 70'	l 58° 12'	l 56° 80'	l 56° 58'	h 57° 08'	l 58° 74'	l 58° 08'	l 59° 36'	l 54° 86'	<i>M</i> = 57" 57 <i>w</i> = 7.88 $\frac{1}{w}$ = 0.13 <i>C</i> = 61° 46' 15" 57
	l 58° 04'	l 60° 48'	l 58° 12'	l 58° 42'	h 56° 94'	l 56° 98'	l 57° 10'	h 55° 24'	l 59° 12'	l 56° 60'	
	l 58° 56'	l 58° 90'	l 58° 08'	l 58° 72'	h 56° 96'	l 57° 52'	l 58° 30'	h 54° 58'	l 56° 58'	l 57° 08'	
	l 57° 74'						h 57° 30'	l 54° 54'			
	58° 47'	59° 21'	58° 11'	57° 98'	56° 83'	57° 19'	58° 05'	56° 30'	57° 40'	56° 18'	
At CVII											
<i>November 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 26'	194° 26'	21° 37'	201° 37'	28° 48'	208° 48'	
CIV & CV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 24" 93 <i>w</i> = 8.35 $\frac{1}{w}$ = 0.12 <i>C</i> = 63° 32' 24" 94
	h 25° 10'	h 23° 72'	l 23° 88'	l 22° 70'	l 21° 72'	l 21° 78'	h 24° 96'	h 28° 22'	h 27° 56'	h 25° 80'	
	h 24° 96'	h 24° 80'	l 24° 38'	l 24° 96'	l 26° 86'	l 22° 78'	h 26° 98'	h 24° 34'	h 24° 46'	h 25° 64'	
	h 25° 26'	h 27° 90'	l 24° 50'	l 22° 30'	l 26° 00'	l 25° 62'	h 25° 62'	h 24° 32'	h 24° 92'	l 25° 12'	
	l 25° 84'			l 24° 82'	l 25° 78'		h 24° 46'	l 25° 12'			
	25° 11'	25° 57'	24° 25'	23° 32'	24° 85'	23° 99'	25° 85'	25° 34'	25° 52'	25° 52'	

At CVII—(Continued.)											
<i>November 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 26'	194° 26'	21° 37'	201° 37'	28° 49'	208° 49'	
CV & CVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 6".90 <i>w</i> = 12.34 $\frac{1}{w}$ = 0.08 <i>C</i> = 76° 58' 6".89
	h 6.74	h 5.76	l 7.60	l 7.74	l 4.88	l 8.26	h 6.24	h 6.86	h 4.70	h 7.80	
	h 7.44	h 8.28	l 7.36	l 8.54	l 4.98	l 8.22	h 5.78	h 5.82	h 7.70	h 6.16	
	h 6.78	h 5.20	l 6.52	l 7.20	l 6.70	l 6.58	h 6.74	h 7.40	h 6.92	l 10.32	
		l 6.12			l 6.74				l 5.86	l 7.46	
	6.99	6.34	7.16	7.83	5.83	7.69	6.25	6.69	6.30	7.94	
At CVIII											
<i>December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 28'	194° 25'	21° 37'	201° 36'	28° 49'	208° 49'	
CVII & CV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 15".65 <i>w</i> = 7.98 $\frac{1}{w}$ = 0.13 <i>C</i> = 46° 57' 15".65
	h 16.70	l 14.06	h 15.92	h 16.04	l 17.56	l 15.92	l 14.14	l 15.30	h 14.12	h 13.78	
	l 12.98	l 14.68	h 15.96	h 16.92	l 17.40	l 15.98	l 17.48	l 16.34	h 15.20	h 15.48	
	l 14.70	l 15.02	h 16.42	l 16.22	l 16.70	l 16.14	l 17.64	l 15.26	h 15.84	h 14.78	
	l 12.26						l 17.32				
	14.16	14.59	16.10	16.39	17.22	16.01	16.65	15.63	15.05	14.68	
CV & CIX	l 37.18	l 36.02	h 39.26	h 35.38	l 34.78	l 34.82	l 36.06	l 37.26	h 37.08	h 35.50	<i>M</i> = 36".39 <i>w</i> = 6.01 $\frac{1}{w}$ = 0.17 <i>C</i> = 53° 24' 36".39
	l 37.58	l 35.84	h 38.84	h 34.78	l 34.38	l 35.00	l 37.98	l 37.92	h 35.50	h 36.36	
	l 36.32	l 35.04	h 37.44	l 33.80	l 35.80	l 35.60	l 37.62	l 37.60	h 37.48	h 37.02	
			l 35.28								
	37.03	35.63	38.51	34.81	34.99	35.14	37.22	37.59	36.69	36.29	

## At CVIII—(Continued.)

December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 28'	194° 25'	21° 37'	201° 36'	28° 49'	206° 49'	
CIX & CXII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 34" 17 <i>w</i> = 8.58 $\frac{1}{w}$ = 0.12 <i>C</i> = 49° 20' 34" 16
	l 31° 76	l 37° 02	h 32° 06	h 33° 54	l 33° 58	l 34° 82	l 36° 44	l 33° 88	h 33° 62	h 34° 76	
	l 32° 36	l 35° 74	h 33° 32	h 34° 08	l 33° 78	l 34° 64	l 33° 60	l 32° 34	h 35° 08	h 32° 84	
	l 34° 20	l 36° 24	h 33° 58	l 35° 38	l 34° 36	l 34° 86	l 34° 28	l 34° 22	h 34° 44	h 32° 04	
	l 34° 48							l 33° 52			
	33° 20	36° 33	33° 29	34° 33	33° 51	34° 77	34° 77	33° 49	34° 38	33° 21	

## At CIX

December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	206° 48'	
CVIII & CV	h 15° 54	l 18° 32	h 15° 32	l 14° 44	l 16° 14	l 18° 54	l 16° 68	h 17° 18	l 16° 48	h 18° 26	<i>M</i> = 16" 33 <i>w</i> = 12.07 $\frac{1}{w}$ = 0.08 <i>C</i> = 68° 26' 16" 34
	l 18° 16	l 18° 20	h 18° 12	l 14° 54	l 15° 90	l 16° 32	l 16° 84	h 17° 50	l 17° 58	h 14° 86	
	l 14° 18	l 16° 38	h 17° 68	l 16° 14	h 15° 40	l 17° 90	l 16° 62	h 15° 82	l 15° 84	h 16° 00	
	l 15° 36	l 13° 78	l 14° 52			l 16° 42				h 17° 68	
		l 13° 96									
		l 15° 94									
	15° 81	16° 10	16° 41	15° 04	15° 81	17° 30	16° 71	16° 83	16° 63	16° 70	

CV &amp; CVI

l 44° 38 l 46° 98 l 47° 64 l 48° 18 l 45° 12 l 45° 60 l 47° 44 l 46° 90 l 46° 14 h 45° 90  
 l 45° 36 l 46° 92 l 47° 88 l 49° 34 l 46° 60 l 49° 18 l 47° 28 l 46° 74 l 46° 46 h 47° 52  
 l 46° 14 l 47° 74 l 48° 46 l 46° 80 l 49° 72 l 46° 92 l 47° 66 l 46° 96 l 47° 04 h 45° 62  
 l 46° 36 l 47° 68 h 46° 20

*M* = 47" 01*w* = 10.61 $\frac{1}{w}$  = 0.09*C* = 68° 14' 47" 01

45° 29 47° 21 47° 99 48° 11 46° 95 47° 35 47° 46 46° 87 46° 55 46° 31

At CIX—(Continued.)											
<i>December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
CVI & CX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 41''·77 <i>w</i> = 5·57 $\frac{1}{w}$ = 0·18 <i>C</i> = 41° 39' 41''·77
	l 44'·86 l 46'·50 l 45'·30 l 43'·40 h 41'·68 l 43'·14 l 41'·56	l 41'·50 l 39'·56 l 40'·70 h 40'·30 l 41'·68	l 39'·94 l 39'·92 l 38'·96 l 42'·08	l 39'·48 l 38'·34 l 40'·18 l 41'·96 l 39'·78	l 43'·06 l 42'·76 l 41'·26 l 41'·96 l 42'·12	l 40'·22 l 40'·62 l 41'·32 l 42'·20 l 42'·12	l 42'·30 l 42'·32 l 42'·10 l 42'·20	l 42'·12 l 43'·36 l 42'·02 l 42'·46	l 42'·12 l 42'·42 l 42'·46 h 42'·46	h 43'·82 h 40'·24 h 43'·22 h 42'·46	
	43'·78	40'·52	40'·23	39'·95	42'·36	41'·30	42'·24	42'·50	42'·33	42'·44	
CX & CXI	h 18'·00	l 16'·80	h 17'·10	l 21'·32	l 17'·98	l 19'·74	l 15'·56	h 15'·62	l 17'·30	h 15'·38	<i>M</i> = 17''·46 <i>w</i> = 4·24 $\frac{1}{w}$ = 0·24 <i>C</i> = 48° 19' 17''·41
	l 16'·78 l 13'·62 l 18'·12	l 19'·38 l 18'·12	h 17'·26 h 17'·12	l 21'·74 l 17'·30 l 20'·34 l 18'·28	l 18'·52 h 19'·08 h 19'·06 h 17'·86 l 16'·34	l 20'·34 l 21'·58 h 19'·06 h 17'·86 l 16'·34	l 15'·16 l 15'·80	h 16'·42 l 17'·54	l 16'·92 l 15'·30	h 17'·06 h 17'·62	
	16'·63	18'·10	17'·16	19'·80	18'·53	19'·15	15'·51	16'·53	16'·51	16'·69	
CXI & CXII	h 30'·58	l 34'·78	h 33'·92	l 32'·16	l 31'·82	l 32'·58	l 34'·56	h 34'·88	l 35'·54	h 34'·08	<i>M</i> = 33''·11 <i>w</i> = 6·29 $\frac{1}{w}$ = 0·16 <i>C</i> = 55° 23' 33''·08
	l 34'·60 l 32'·04 l 31'·50	l 33'·42 l 32'·98	h 31'·80 h 31'·56	l 32'·32 l 33'·16 l 32'·92	l 31'·52 h 31'·38 l 30'·36 l 32'·10 h 33'·64 l 32'·62	l 30'·62 l 30'·18 l 33'·48 h 33'·64	l 35'·18 l 34'·34	h 33'·72 l 31'·98	l 34'·24 l 35'·36	h 31'·26 h 33'·86	
	32'·18	33'·73	32'·43	32'·64	31'·63	32'·10	34'·69	33'·53	35'·05	33'·07	
CXII & CVIII	h 26'·24	l 23'·44	h 24'·58	l 24'·24	l 24'·60	l 21'·76	l 23'·68	h 24'·68	l 21'·20	h 21'·22	<i>M</i> = 23''·81 <i>w</i> = 6·68 $\frac{1}{w}$ = 0·15 <i>C</i> = 77° 56' 23''·81
	l 26'·20 l 26'·14 l 22'·58 l 24'·14	l 25'·22 l 25'·34	h 23'·82 h 24'·08	l 24'·60 l 22'·66	l 25'·22 h 26'·28	l 22'·84 l 23'·16 l 23'·42	l 23'·30 l 23'·56	h 23'·40 l 23'·82	l 21'·08 l 22'·72	h 23'·98 h 24'·00	
	25'·06	24'·67	24'·16	23'·83	25'·37	22'·80	23'·51	23'·97	21'·67	23'·07	

At CX											
<i>December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle reading, telescope being set on CXI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
CXI & CIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 26'' 97 <i>w</i> = 35 '98 $\frac{1}{w}$ = 0 '03 <i>C</i> = 72° 38' 26'' 97
	l 26° 04	h 26° 28	l 27° 32	l 25° 80	l 26° 92	l 27° 14	l 28° 76	l 26° 66	h 26° 94	h 27° 72	
	l 26° 28	h 27° 14	l 27° 20	l 25° 98	l 26° 74	l 27° 14	l 27° 34	l 26° 80	h 27° 42	h 26° 74	
	l 26° 78	h 26° 72	l 27° 32	l 27° 44	l 27° 34	l 27° 38	l 27° 16	l 26° 10	h 27° 76	h 25° 72	
				l 27° 58							
	26° 37	26° 71	27° 28	26° 70	27° 00	27° 22	27° 75	26° 52	27° 37	26° 73	
CIX & CVI	l 34° 60	h 34° 44	l 32° 42	l 37° 12	l 34° 04	l 37° 30	l 32° 96	l 33° 96	h 34° 26	h 33° 78	<i>M</i> = 34'' 34 <i>w</i> = 14 '52 $\frac{1}{w}$ = 0 '07 <i>C</i> = 73° 56' 34'' 36
	l 34° 46	h 35° 02	l 34° 34	l 34° 74	l 33° 36	l 36° 28	l 34° 04	l 34° 60	l 33° 60	h 34° 46	
	l 34° 24	h 34° 50	l 34° 76	l 34° 34	l 32° 30	l 33° 96	l 34° 48	l 34° 82	l 33° 72	h 34° 50	
				l 34° 88		l 34° 76					
	34° 43	34° 65	33° 84	35° 27	33° 23	35° 58	33° 83	34° 46	33° 86	34° 25	
At CXI											
<i>March 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXIV & CXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 20'' 63 <i>w</i> = 6 '34 $\frac{1}{w}$ = 0 '16 <i>C</i> = 69° 48' 20'' 65
	h 20° 64	l 21° 64	l 23° 40	l 21° 38	l 19° 82	l 18° 76	l 22° 38	h 17° 88	l 22° 50	l 20° 04	
	h 19° 08	l 19° 90	l 22° 40	l 23° 80	l 20° 96	l 19° 04	l 22° 00	l 22° 36	l 18° 72	l 19° 74	
	h 18° 58	l 19° 18	l 22° 00	l 19° 80	l 22° 08	l 18° 98	l 21° 14	l 24° 08	l 21° 02	l 19° 30	
			h 19° 76	l 18° 64				l 22° 18	l 21° 02		
				l 20° 70							
	19° 43	20° 24	21° 89	20° 86	20° 95	18° 93	21° 84	21° 63	20° 82	19° 69	

At CXI—(Continued.)

\*March 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.

†December 1859, observed by Lieutenants J. P. Basevi and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CXIV										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 48'		
* CXIII & CXII	"	"	"	"	"	"	"	"	"	"	M = 49''·72 w = 9·22 $\frac{1}{w}$ = 0·11 C = 65° 13' 49''·71	
	h 49·88 l 50·02 l 48·98 l 47·04 l 50·66 l 49·22 l 50·44 h 50·22 l 48·90 l 49·24	h 52·10 l 50·56 l 47·58 l 48·36 l 50·24 l 50·36 l 49·90 l 48·76 l 52·20 l 48·72	h 52·08 l 51·08 l 47·88 l 50·26 l 48·98 l 50·78 l 49·72 l 48·04 l 49·54 l 48·34	h 48·74 l 50·66 l 49·02	l 49·48							
	51·35	50·55	48·30	49·07	49·96	50·12	50·02	49·01	50·03	48·77		
* CXII & CXIX	h 2·34 l 2·54 l 0·68 l 5·32 l 1·52 l 0·10 l 3·82 h 3·00 l 1·94 l 2·04	h 1·34 l 2·28 l 2·44 l 5·00 l 1·76 l 4·14 l 3·96 l 3·08 l 2·98 l 1·28	h 1·46 l 4·14 l 0·56 l 6·88 l 3·12 l 2·60 l 3·74 l 2·36 l 5·10 l 1·70	h 4·64 h 3·18 l 2·20 l 2·16	l 4·24						M = 2''·74	
	1·71	2·99	2·28	4·12	2·13	2·77	3·84	2·81	3·05	1·67		
	Circle readings, telescope being set on CXII											
† CXII & CXIX	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	206° 48'	w = 25·81 $\frac{1}{w}$ = 0·04 C = 51° 39' 2''·97	
	"	"	"	"	"	"	"	"	"	"		
	h 4·70 l 5·82 l 3·60 l 2·86 h 2·22 h 2·66 h 1·36 l 3·18 l 2·56 l 1·68	h 4·10 l 3·50 l 2·62 l 3·40 h 3·26 h 1·20 h 3·60 l 1·92 l 3·46 l 2·04	h 3·82 l 3·10 l 3·84 l 3·58 h 2·86 h 3·00 h 3·68 l 3·08 l 3·72 l 2·54	l 3·42								
4·21	3·96	3·35	3·28	2·78	2·29	2·88	2·73	3·25	2·09	M = 3''·08		

<i>At CXI—(Continued.)</i>											
<i>December 1859, observed by Lieutenants J. P. Basevi and R. H. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	208° 48'	
CXI & CX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 16''·13 <i>w</i> = 4·40 $\frac{1}{w}$ = 0·23 <i>C</i> = 59° 2' 16''·12
	h 15'·24	l 12'·48	l 12'·36	l 14'·20	h 15'·98	h 18'·18	h 18'·34	l 16'·08	l 17'·50	l 18'·04	
	h 15'·30	l 13'·32	l 14'·20	l 14'·10	h 17'·44	h 18'·34	h 16'·72	l 17'·52	l 16'·44	l 16'·64	
	l 13'·72	l 14'·78	l 13'·18	l 14'·54	h 16'·86	h 17'·16	h 16'·68	l 18'·22	l 16'·24	l 17'·12	
		h 17'·88	h 15'·88			h 17'·06	l 17'·70				
		h 15'·26	h 16'·60								
	14'·75	14'·74	14'·44	14'·28	16'·76	17'·69	17'·36	17'·27	16'·73	17'·27	
<i>At CXII</i>											
<i>December 1859, observed by Lieutenants J. P. Basevi and R. H. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 48'	
CVIII & CLX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 3''·31 <i>w</i> = 9·10 $\frac{1}{w}$ = 0·11 <i>C</i> = 52° 43' 3''·31
	h 2'·76	h 3'·56	l 0'·92	l 4'·84	l 4'·98	l 3'·30	h 5'·28	h 2'·40	l 4'·06	l 3'·24	
	h 3'·26	h 4'·50	l 1'·70	l 3'·68	l 2'·88	l 1'·86	h 5'·54	h 3'·32	l 3'·12	l 1'·82	
	h 3'·36	h 3'·30	l 2'·92	l 3'·32	l 2'·84	l 4'·02	h 4'·66	h 4'·72	l 2'·16	l 0'·98	
	3'·13	3'·79	1'·85	3'·95	3'·57	3'·06	5'·16	3'·48	3'·11	2'·01	
CXI & CXI	h 25'·18	h 25'·36	l 25'·68	l 22'·30	l 24'·68	l 24'·52	h 21'·76	h 24'·10	l 23'·72	l 25'·60	<i>M</i> = 24''·38 <i>w</i> = 6·70 $\frac{1}{w}$ = 0·15 <i>C</i> = 72° 57' 24''·38
	h 26'·00	h 25'·14	l 23'·88	l 24'·16	l 23'·66	l 26'·04	h 20'·60	h 23'·56	l 23'·86	l 25'·04	
	h 24'·54	h 26'·00	l 25'·72	l 24'·92	l 25'·30	l 24'·16	h 22'·64	h 23'·04	l 25'·00	l 25'·12	
	25'·24	25'·50	25'·09	23'·79	24'·55	24'·91	21'·67	23'·57	24'·19	25'·25	

At CXII—(Continued.)											
<i>April 1859, observed by Lieutenant J. P. Basevi with Troughton and Simm's 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	200° 1'	20° 1'	279° 13'	99° 14'	358° 25'	178° 26'	77° 37'	257° 37'	156° 50'	336° 50'	
CXI & CXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 18° 51 <i>w</i> = 5 99 $\frac{1}{w}$ = 0 17 <i>C</i> = 61° 39' 18" 54
	l 14° 86	l 19° 74	h 17° 50	l 17° 20	h 17° 92	l 20° 82	l 21° 86	l 19° 34	l 18° 32	l 17° 24	
	l 19° 52	l 18° 92	h 17° 36	l 18° 00	h 16° 32	l 18° 98	l 20° 40	l 20° 08	l 17° 62	l 17° 94	
	l 17° 46	l 17° 30	l 19° 88	l 17° 72	l 21° 10	l 20° 42	l 22° 58	l 19° 76	l 18° 66	l 16° 18	
	l 18° 80				l 20° 34		l 21° 70	h 15° 50			
							h 17° 74	h 16° 84			
							h 17° 72				
	17° 66	18° 65	18° 25	17° 64	18° 92	20° 07	20° 33	18° 30	18° 20	17° 12	
CXIII & CXV	l 14° 46	l 10° 64	h 11° 30	l 12° 02	h 10° 58	l 9° 68	l 12° 38	l 10° 42	l 11° 26	l 11° 12	<i>M</i> = 11° 21 <i>w</i> = 15 16 $\frac{1}{w}$ = 0 07 <i>C</i> = 52° 0' 11" 19
	l 11° 02	l 13° 18	h 13° 18	l 11° 88	h 11° 18	l 11° 82	l 11° 54	l 9° 40	l 11° 14	l 10° 00	
	l 11° 28	l 11° 70	l 10° 48	l 11° 86	l 9° 42	l 10° 56	l 10° 50	l 9° 70	l 11° 52	l 12° 42	
	l 10° 84				l 10° 58		l 10° 30	h 10° 38			
								h 10° 08			
	11° 90	11° 84	11° 65	11° 92	10° 44	10° 69	11° 18	10° 00	11° 31	11° 18	
At CXIII											
<i>March 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
CXIV & CXVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 47° 67 <i>w</i> = 6 45 $\frac{1}{w}$ = 0 16 <i>C</i> = 57° 8' 47" 68
	h 48° 82	l 47° 78	l 45° 76	d 46° 60	l 48° 74	l 48° 06	l 47° 74	l 47° 94	l 48° 50	l 50° 98	
	l 45° 40	l 48° 00	l 48° 08	l 46° 00	l 46° 86	l 47° 80	l 47° 18	l 45° 56	l 48° 58	l 48° 94	
	l 45° 76	h 51° 36	l 47° 02	l 45° 54	l 47° 58	l 46° 36	l 49° 30	l 45° 98	l 48° 08	l 49° 54	
	l 46° 14	l 49° 70		l 47° 56			l 47° 74			h 48° 92	
	46° 53	49° 21	46° 95	46° 43	47° 73	47° 41	47° 99	46° 49	48° 39	49° 60	



At CXIII—(Continued.)											
March 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXVI & CXVII	"	"	"	"	"	"	"	"	"	"	
	h 19°42	l 18°00	l 18°56	d 20°57	l 18°72	l 17°94	l 20°72	l 20°60	l 19°56	l 19°32	M = 19''39
	l 20°60	l 18°72	l 18°12	l 20°12	l 18°94	l 19°90	l 20°96	l 22°20	l 21°36	l 18°80	w = 8.00
	l 19°66	h 16°38	l 19°70	l 22°10	l 17°64	l 18°72	l 17°92	l 20°66	l 18°64	l 18°78	$\frac{1}{w} = 0.13$
		l 19°88		l 18°80	l 16°72		l 19°28				C = 73° 43' 19''38
	19°89	18°25	18°79	20°40	18°01	18°85	19°72	21°15	19°85	18°97	
CXVII & CXV	h 53°88	l 52°90	l 56°44	l 50°58	l 53°12	l 53°72	l 53°64	l 51°02	l 55°34	l 52°66	M = 53''55
	h 54°64	l 53°10	l 56°66	l 54°06	l 53°56	l 51°98	l 53°10	l 50°58	l 52°20	l 53°52	w = 7.02
	h 52°90	l 53°42	l 55°26	l 53°04	l 54°02	l 52°04	l 54°60	l 51°40	l 53°60	l 53°20	$\frac{1}{w} = 0.14$
		h 56°10	l 53°50	l 53°64	l 54°30		l 53°90	l 55°54			C = 71° 28' 53''54
	53°81	53°14	56°12	52°74	53°59	53°01	53°78	52°00	54°17	53°13	
CXV & CXII	h 4°70	l 0°02	l 2°30	l 3°96	l 4°78	l 2°96	l 2°06	l 4°20	l 2°10	l 3°72	M = 3''33
	h 3°04	l 1°24	l 1°08	l 3°64	l 4°32	l 3°04	l 2°80	l 4°68	l 3°28	l 3°74	w = 8.58
	h 4°22	l 0°38	l 3°72	l 4°18	l 5°14	l 3°36	l 2°16	l 4°02	l 2°86	l 4°44	$\frac{1}{w} = 0.12$
		l 2°08									C = 54° 9' 3''32
	3°99	1°81	2°37	3°93	4°75	3°12	2°34	4°30	2°75	3°97	
CXII & CXI	h 49°94	h 52°82	l 53°40	l 53°18	l 53°62	l 53°60	l 51°78	l 54°18	l 52°76	l 52°64	M = 52''73
	h 50°88	l 48°66	l 52°46	l 50°62	l 53°56	l 55°68	l 51°52	l 54°52	l 52°44	l 50°74	w = 5.82
	h 51°36	l 54°26	l 51°76	l 52°38	l 53°82	l 54°48	l 53°34	l 54°86	l 52°44	l 49°94	$\frac{1}{w} = 0.17$
	h 52°62	l 53°22							h 51°14		C = 53° 6' 52''71
	h 54°12										
	51°78	52°24	52°54	52°06	53°67	54°59	52°21	54°52	52°55	51°12	
CXI & CXIV	l 6°10	h 1°82	l 3°42	l 4°82	l 1°54	l 2°92	l 3°54	l 2°20	l 0°98	l 2°46	M = 3''38
	l 3°54	h 3°12	l 4°78	l 4°66	l 0°88	l 0°80	l 3°74	l 3°40	l 1°88	l 5°16	w = 7.90
	l 5°00	h 1°60	l 3°62	l 5°38	l 0°92	l 3°54	l 2°34	l 2°80	l 5°20	l 4°74	$\frac{1}{w} = 0.13$
	l 4°82	l 6°32		h 2°96	l 1°46	l 3°16			l 4°08		C = 50° 23' 3''37
	h 4°40				l 3°10						
	4°77	3°22	3°94	4°46	1°58	2°61	3°21	2°80	3°04	4°12	

At CXIV											
March 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on XCVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXVI & CXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 25".95 <i>w</i> = 6.65 $\frac{1}{w}$ = 0.15 <i>C</i> = 59° 34' 25".92
	l 24.20	l 23.98	l 25.56	l 25.36	l 24.66	l 26.24	l 28.38	l 25.06	l 27.48	l 27.68	
CXIII & CXI	l 24.06	l 23.34	l 24.62	l 25.60	l 23.30	l 24.92	l 25.60	l 26.66	l 27.32	l 25.22	<i>M</i> = 37".57 <i>w</i> = 8.56 $\frac{1}{w}$ = 0.12 <i>C</i> = 59° 48' 37".56
	l 24.52	l 23.80	l 24.26	l 26.16	l 25.04	l 23.98	l 27.62	l 26.88	l 28.24	l 27.64	
	l 28.46	l 26.32			l 25.24	h 25.94					
	l 27.70	l 28.68									
	h 26.70										
	25.79	25.47	24.81	25.71	24.56	25.27	27.20	26.20	27.68	26.85	
	l 37.96	l 38.70	l 37.60	l 37.58	l 38.70	l 36.32	l 36.04	l 36.76	l 34.34	l 36.64	
	l 38.04	l 38.96	l 37.46	l 39.06	l 40.14	l 36.46	l 36.98	l 38.28	l 35.30	l 38.64	
	l 37.50	l 38.70	l 37.32	l 38.14	l 38.86	l 37.54	l 37.30	l 36.48	l 35.86	l 36.24	
					h 38.04			l 38.00			
	37.83	38.79	37.46	38.26	39.23	37.09	36.77	37.17	35.88	37.17	
At CXV											
March 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 24'	21° 37'	201° 37'	28° 49'	208° 50'	
CXII & CXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 45".67 <i>w</i> = 24.40 $\frac{1}{w}$ = 0.04 <i>C</i> = 73° 50' 45".67
	h 45.40	l 45.96	l 47.22	l 44.28	l 46.44	l 46.06	l 46.18	l 45.92	l 44.80	h 44.48	
CXIII & CXVII	l 46.02	l 45.24	l 45.92	l 45.18	l 45.92	l 45.54	l 46.44	l 45.56	h 45.94	h 45.12	<i>M</i> = 17".57 <i>w</i> = 9.08 $\frac{1}{w}$ = 0.11 <i>C</i> = 48° 33' 17".57
	l 44.24	l 44.58	l 45.58	l 44.96	l 45.88	l 45.70	l 47.00	l 45.98	h 47.02	h 45.64	
	45.22	45.26	46.24	44.81	46.08	45.77	46.54	45.82	45.92	45.08	
	h 16.74	l 17.54	l 17.60	l 19.22	l 16.24	l 17.02	l 20.16	l 18.20	l 19.96	h 18.62	
	l 15.18	l 16.80	l 17.16	l 17.56	l 15.56	l 18.12	l 17.60	l 18.24	h 17.10	h 17.12	
	l 16.88	l 16.68	l 17.68	l 18.62	l 15.70	l 18.42	l 17.56	l 20.00	h 17.02	h 17.46	
						l 17.52		h 17.94			
	16.27	17.01	17.48	18.47	15.83	17.85	18.21	18.81	18.01	17.73	

At CXVI											
<i>March 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 18'	14° 25'	194° 25'	21° 36'	201° 38'	28° 49'	208° 50'	
CXIX & CXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 6''·11 <i>w</i> = 7·66 $\frac{1}{w}$ = 0·13 <i>C</i> = 57° 44' 6''·09
	l 4·88	l 7·74	h 4·96	l 6·18	l 9·04	l 4·98	h 5·18	l 8·70	l 6·82	h 7·22	
	l 5·08	l 6·14	h 2·86	l 4·84	l 6·70	l 7·30	l 6·20	l 7·44	h 5·82	h 3·70	
	l 4·42	l 5·88	h 3·16	l 5·38	l 5·56	l 6·34	l 8·72	l 7·18	h 7·12	h 6·18	
	l 5·44		h 4·32		l 7·22		l 5·16			h 5·80	
			l 5·88								
			l 5·06								
	4·96	6·59	4·37	5·47	7·13	6·21	6·32	7·77	6·59	5·73	
CXVIII & CXVII	l 47·56	l 46·12	h 48·18	l 48·66	l 44·74	l 46·92	l 50·94	l 49·76	l 46·76	h 47·06	<i>M</i> = 47''·57 <i>w</i> = 6·95 $\frac{1}{w}$ = 0·14 <i>C</i> = 60° 22' 47''·57
	l 46·58	l 48·36	h 48·88	l 48·18	l 47·78	l 44·28	l 50·40	l 48·86	h 48·10	h 46·58	
	l 47·02	l 48·56	l 46·26	l 46·14	l 46·62	l 46·24	l 47·56	l 48·54	h 46·20	h 48·94	
	l 46·96					l 47·04	l 48·96				
	47·03	47·68	47·77	47·66	46·38	46·12	49·47	49·05	47·02	47·53	
CXVII & CXIII	l 18·56	l 17·74	h 15·76	l 16·44	l 19·80	l 17·66	l 13·56	l 14·56	l 18·16	h 15·68	<i>M</i> = 16''·69 <i>w</i> = 7·00 $\frac{1}{w}$ = 0·14 <i>C</i> = 39° 51' 16''·70
	l 18·32	l 17·46	h 15·72	l 14·28	l 18·62	l 18·48	l 15·64	l 15·50	h 16·34	h 16·00	
	l 19·02	l 16·82	l 15·98	l 17·64	l 17·22	l 15·88	l 15·34	l 15·58	h 17·24	h 17·02	
	l 17·64			l 18·12	l 16·10	l 15·34	l 16·56				
	18·39	17·34	15·82	16·62	17·94	16·84	15·28	15·21	17·25	16·23	
CXIII & CXIV	l 44·64	l 46·28	h 43·64	l 47·42	l 48·96	l 44·64	l 47·48	l 49·94	h 47·56	h 47·32	<i>M</i> = 46''·61 <i>w</i> = 4·71 $\frac{1}{w}$ = 0·21 <i>C</i> = 63° 16' 46''·58
	l 45·86	l 45·06	h 43·86	l 48·40	l 46·14	l 45·44	l 44·12	l 48·44	h 48·54	h 45·76	
	l 44·62	l 45·56	l 49·24	l 45·68	l 44·34	h 49·00	l 45·00	l 49·74	h 47·12	l 45·96	
	l 43·88		l 46·26	l 47·54	l 46·26	h 48·48	l 45·74				
	l 46·44										
	45·09	45·63	45·75	47·26	46·43	46·89	45·59	49·37	47·74	46·35	

At CXVII											
<i>February 1859, observed by Lieutenant J. P. Basevi and Mr. N. Belletty with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXV & CXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 49''·18 <i>w</i> = 6·08 $\frac{1}{w}$ = 0·16 <i>C</i> = 59° 57' 49''·20
	l 48·34	h 48·84	l 49·60	l 48·76	l 49·72	l 50·70	l 49·70	l 48·48	l 48·58	l 48·38	
	l 49·44	h 46·84	l 51·28	l 48·30	l 49·18	l 50·30	l 51·68	l 47·90	l 49·66	l 48·70	
	l 46·88	h 48·32	l 52·78	l 48·78	l 51·26	l 49·42	l 52·08	l 47·94	l 48·78	l 47·12	
			l 48·14				h 51·70				
			l 49·82								
	48·22	48·00	50·32	48·61	50·05	50·14	51·29	48·11	49·01	48·07	
CXIII & CXVI	l 25·72	l 24·90	l 26·40	l 25·20	l 26·04	l 22·36	l 26·76	l 27·36	l 24·84	l 27·68	<i>M</i> = 25''·50 <i>w</i> = 9·10 $\frac{1}{w}$ = 0·11 <i>C</i> = 66° 25' 25''·49
	l 24·56	l 25·56	l 25·30	l 25·32	l 25·34	l 24·36	l 25·58	l 24·74	l 29·50	l 26·56	
	l 25·38	l 25·02	l 25·00	l 24·96	l 24·28	l 25·58	l 23·60	l 25·86	l 25·72	l 27·78	
						l 25·78	h 22·50		l 24·64		
	25·22	25·16	25·57	25·16	25·22	24·52	24·61	25·99	26·18	27·34	
CXVI & CXVIII	l 26·52	l 26·12	l 23·58	l 24·80	l 22·26	l 25·02	l 25·12	l 24·24	l 26·02	l 23·46	<i>M</i> = 24''·73 <i>w</i> = 9·64 $\frac{1}{w}$ = 0·10 <i>C</i> = 49° 31' 24''·73
	l 27·22	l 24·20	l 24·40	l 25·44	l 24·70	l 24·30	l 24·58	l 24·16	l 21·48	l 24·40	
	l 26·22	l 25·96	l 24·06	l 24·50	l 23·76	l 25·22	l 24·48	l 23·72	l 25·36	l 24·36	
							h 25·94		l 26·18		
	26·65	25·43	24·01	24·91	23·57	24·85	25·03	24·04	24·76	24·07	
CXVIII & CXX	l 63·30	h 61·46	l 62·82	l 62·52	l 63·84	l 62·38	l 60·98	l 59·66	l 63·48	l 61·24	<i>M</i> = 61''·87 <i>w</i> = 11·82 $\frac{1}{w}$ = 0·08 <i>C</i> = 45° 11' 61''·86
	l 61·96	h 61·24	l 61·22	l 62·00	l 62·30	l 61·58	l 60·42	l 62·06	l 62·72	l 60·86	
	l 60·90	h 59·82	l 61·46	l 60·96	l 63·78	l 60·66	l 63·06	l 63·26	l 62·98	l 62·52	
							h 60·30	l 61·00			
	62·05	60·84	61·83	61·83	63·31	61·54	61·19	61·50	63·06	61·54	

At CXVIII											
February 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXVII										M = Mean of Groups w = Relative Weight C = Concluded Angl
	0° 1'	180° 2'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXVII & CXIX	"	"	"	"	"	"	"	"	"	"	M = 55''·21 w = 4·81 $\frac{1}{w}$ = 0·21 C = 55° 12' 55''·21
	h 55'·14 h 54'·68 h 55'·50	l 53'·20 l 52'·50 l 53'·90	l 51'·92 l 53'·50 l 53'·86 l 53'·76 l 53'·62	l 56'·62 l 54'·16 l 53'·54 l 56'·00 l 58'·66	l 57'·98 h 55'·66 h 55'·64 l 58'·66 l 55'·90	l 58'·66 l 56'·48 l 57'·44 l 55'·90	h 55'·20 h 53'·86 h 55'·02	l 54'·22 l 53'·68 l 56'·90 l 55'·78	l 55'·16 l 55'·46 h 54'·38	l 55'·02 l 56'·54 l 57'·68	
	55'·11	53'·20	53'·33	55'·08	56'·99	57'·12	54'·69	55'·15	55'·00	56'·41	
CXIX & CXVII	h 38'·54 h 38'·72 h 40'·62	l 39'·22 l 38'·16 l 36'·90	d 37'·36 l 38'·76 l 38'·98 h 38'·38	l 37'·30 l 37'·34 l 37'·04 l 37'·46	h 39'·84 l 37'·78 l 37'·50	l 36'·50 l 36'·64 l 35'·98	h 35'·20 l 37'·76 l 36'·18	l 36'·00 l 36'·48 l 35'·86	l 38'·28 l 37'·52 h 37'·92	l 40'·44 l 39'·44 l 37'·28 l 37'·10	M = 37''·68 w = 7·19 $\frac{1}{w}$ = 0·14 C = 52° 8' 37''·68
		39'·29	38'·09	38'·37	37'·29	38'·37	36'·37	36'·38	36'·11	37'·91	
CXVII & CXVI	l 46'·28 l 47'·20 l 46'·42 l 48'·92	l 47'·58 l 49'·54 l 50'·16	d 46'·89 l 46'·64 h 48'·64 h 49'·44	l 48'·84 l 48'·96 l 52'·46 l 48'·56	h 47'·98 l 47'·64 l 47'·72	l 47'·76 l 48'·42 l 49'·20	h 49'·28 l 48'·44 l 50'·54	l 46'·42 l 47'·90 l 47'·56	l 50'·20 l 50'·72 h 49'·36	l 49'·06 l 47'·46 l 49'·32	M = 48''·56 w = 7·55 $\frac{1}{w}$ = 0·13 C = 70° 5' 48''·55
		47'·21	49'·09	47'·90	49'·71	47'·78	48'·46	49'·42	47'·29	50'·09	
CXVI & CXIX	l 32'·30 l 32'·48 l 34'·04 l 28'·90 l 29'·02	l 32'·28 l 31'·40 l 30'·96	l 30'·96 l 31'·26 h 30'·28	l 27'·34 l 30'·84 l 26'·70 l 29'·38	h 34'·06 h 33'·98 h 32'·16 l 27'·52 l 31'·16	l 31'·84 l 29'·90 l 32'·06	h 30'·02 h 30'·00 h 34'·26 l 33'·36	l 32'·90 l 31'·96 l 30'·74 l 31'·82	l 26'·96 l 27'·88 h 28'·82 h 30'·60 h 30'·50	l 31'·96 l 29'·44 l 30'·88	M = 36''·88 w = 4·79 $\frac{1}{w}$ = 0·21 C = 60° 19' 30''·87
		31'·35	31'·55	30'·83	28'·57	31'·78	31'·27	31'·91	31'·86	28'·95	
CXIX & CXXI	h 54'·30 h 54'·14 l 52'·42 l 55'·42	l 53'·92 l 53'·76 l 54'·00 l 56'·40	l 55'·10 l 54'·98 l 56'·34	l 57'·00 l 55'·64 l 56'·36 l 53'·78 l 54'·12 l 56'·58	h 54'·96 h 53'·86 l 51'·76 l 53'·78 l 54'·12 l 56'·58	l 55'·72 l 56'·02 l 55'·32	h 54'·82 h 54'·14 l 53'·02	l 54'·64 l 54'·32 l 56'·96 l 54'·58	l 56'·52 l 56'·30 h 55'·44 l 55'·78	h 54'·14 h 55'·56 l 53'·98	M = 55''·03 w = 10·19 $\frac{1}{w}$ = 0·10 C = 53° 25' 55''·00
		54'·07	54'·52	55'·47	56'·33	54'·18	55'·69	53'·99	55'·13	56'·09	

At CXVIII—(Continued.)											
<i>February 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXI & CXXII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 12".73 <i>w</i> = 5.77 $\frac{1}{w}$ = 0.17 <i>C</i> = 68° 47' 12".73
	h 14.68	l 14.76	l 14.40	l 12.84	h 9.86	l 13.14	h 10.82	l 14.90	l 12.86	h 13.54	
	h 14.06	l 15.72	l 13.26	l 13.02	h 11.40	l 9.96	h 12.56	l 15.88	l 12.62	h 12.50	
	h 13.16	l 14.04	l 12.16	l 14.38	h 13.64	l 10.52	l 12.50	l 14.16	h 12.14	l 9.94	
	l 13.76	l 10.02			l 10.12	l 12.08		l 13.40		l 10.34	
		l 12.10									
	13.92	13.33	13.27	13.41	11.26	11.43	11.96	14.59	12.54	11.58	
At CXIX											
<i>February 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
CXXI & CXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 18".03 <i>w</i> = 7.32 $\frac{1}{w}$ = 0.14 <i>C</i> = 70° 58' 18".02
	l 16.90	l 17.94	l 15.04	l 18.24	l 20.46	l 18.08	h 19.82	h 16.90	h 18.34	l 18.08	
	l 15.96	l 16.72	l 16.16	l 18.14	l 20.56	l 19.20	h 19.76	h 17.86	h 17.26	l 17.62	
	l 16.98	l 18.32	l 14.84	l 18.62	l 18.94	l 18.92	h 18.98	h 17.32	l 17.70	l 16.74	
	l 17.36		l 18.36		l 19.82						
			l 18.02								
			l 17.76								
	16.80	17.66	16.70	18.33	19.95	18.73	19.52	17.36	17.77	17.48	
CXVIII & CXVI	l 22.98	l 22.60	l 22.76	l 24.32	l 19.86	l 24.10	h 22.42	h 21.12	h 23.14	l 22.48	<i>M</i> = 22".84 <i>w</i> = 8.42 $\frac{1}{w}$ = 0.12 <i>C</i> = 61° 56' 22".84
	l 21.92	l 23.60	l 24.70	l 24.64	l 20.82	l 23.42	h 21.82	h 21.14	h 22.92	l 23.04	
	l 23.12	l 22.92	l 23.90	l 24.48	l 22.04	l 22.96	h 21.92	h 21.88	l 23.62	l 23.66	
				l 21.90							
	22.67	23.04	23.79	24.48	21.16	23.49	22.05	21.38	23.23	23.06	

At CXX											
<i>February 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXVII & CXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 21''·05 <i>w</i> = 8·30 $\frac{1}{w}$ = 0·12 <i>C</i> = 82° 39' 21''·05
	l 20'10	l 20'04	l 19'86	l 21'20	l 22'80	l 23'04	l 21'06	l 22'18	l 19'96	l 20'28	
	l 20'48	l 19'56	l 20'00	l 20'32	l 21'98	l 23'24	l 21'14	l 21'98	l 22'56	l 21'88	
	l 20'34	l 18'94	l 19'88	l 21'02	l 20'92	l 22'42	l 19'48	l 21'82	l 20'58	l 22'44	
	20'31	19'51	19'91	20'85	21'90	22'90	20'56	21'99	21'03	21'53	
CXVIII & CXXII	l 59'54	l 60'16	l 59'44	l 58'72	l 58'76	l 57'72	l 59'62	l 59'40	l 60'70	l 60'00	<i>M</i> = 59''·32 <i>w</i> = 20·80 $\frac{1}{w}$ = 0·05 <i>C</i> = 75° 21' 59''·32
	l 60'00	l 60'32	l 59'28	l 58'56	l 59'02	l 58'38	l 60'58	l 59'50	l 58'72	l 59'78	
	l 58'82	l 60'34	l 57'88	l 58'42	l 57'94	l 59'60	l 59'62	l 60'10	l 59'46	l 59'22	
	59'45	60'27	58'87	58'57	58'57	58'57	59'94	59'67	59'63	59'67	
At CXXI											
<i>February 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXIV & CXXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 44''·09 <i>w</i> = 6·26 $\frac{1}{w}$ = 0·16 <i>C</i> = 49° 44' 44''·09
	l 45'00	l 47'32	l 44'38	l 43'48	l 45'54	l 46'24	l 45'52	l 45'86	l 43'66	l 45'16	
	l 44'88	l 44'36	l 41'96	l 41'32	l 43'52	l 46'40	l 42'72	l 46'14	l 45'02	l 43'12	
	l 44'96	l 43'06	l 43'30	l 40'16	l 43'94	l 43'50	l 42'62	l 45'40	l 44'46	l 43'44	
		l 43'36		l 41'72		l 42'16		l 45'28			
	44'95	44'53	43'21	41'67	44'33	44'58	43'62	45'67	44'38	43'91	
CXXIII & CXXII	h 1'92	l 0'80	l 1'72	l 2'10	l 3'44	h 2'58	h 3'88	l 2'64	l 2'94	h 3'22	<i>M</i> = 3''·37 <i>w</i> = 13·06 $\frac{1}{w}$ = 0·08 <i>C</i> = 67° 14' 3''·36
	h 2'58	l 2'74	l 2'52	l 4'20	l 5'34	h 2'92	l 4'36	l 2'40	l 2'54	h 3'54	
	h 3'04	h 2'66	l 5'30	l 5'34	l 3'66	h 3'28	l 5'00	l 3'82	l 4'74	h 5'58	
		h 3'12	l 3'18	l 3'02							
	2'51	2'33	3'18	3'67	4'15	2'93	4'41	2'95	3'41	4'11	

At CXXI—(Continued.)											
<i>February 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXIV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXII & CXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 23'' 79 <i>w</i> = 6 42 $\frac{1}{w}$ = 0 16 <i>C</i> = 53° 24' 23'' 78
	<i>h</i> 24'00	<i>l</i> 23'16	<i>l</i> 23'36	<i>l</i> 24'96	<i>l</i> 24'88	<i>h</i> 26'12	<i>h</i> 23'10	<i>l</i> 22'76	<i>l</i> 22'48	<i>h</i> 21'90	
	<i>h</i> 23'20	<i>l</i> 24'22	<i>l</i> 24'42	<i>l</i> 22'94	<i>l</i> 24'42	<i>h</i> 25'70	<i>l</i> 20'06	<i>l</i> 23'50	<i>l</i> 27'98	<i>h</i> 22'92	
	<i>h</i> 23'78	<i>h</i> 24'42	<i>l</i> 22'10	<i>l</i> 23'28	<i>l</i> 24'32	<i>h</i> 25'76	<i>l</i> 22'08	<i>l</i> 22'18	<i>l</i> 24'84	<i>h</i> 24'60	
							<i>l</i> 23'38		<i>l</i> 24'72	<i>h</i> 22'18	
	23'66	23'93	23'29	23'73	24'54	25'86	22'16	22'81	25'01	22'90	
CXVIII & CXIX	<i>h</i> 46'50	<i>l</i> 48'28	<i>l</i> 48'80	<i>l</i> 44'86	<i>l</i> 46'00	<i>h</i> 46'60	<i>l</i> 48'96	<i>l</i> 46'90	<i>l</i> 47'46	<i>h</i> 48'32	<i>M</i> = 47'' 18 <i>w</i> = 7 12 $\frac{1}{w}$ = 0 14 <i>C</i> = 55° 35' 47'' 17
	<i>l</i> 47'06	<i>l</i> 47'06	<i>l</i> 48'88	<i>l</i> 47'10	<i>l</i> 46'08	<i>h</i> 46'98	<i>l</i> 47'84	<i>l</i> 48'82	<i>l</i> 44'56	<i>h</i> 46'74	
	<i>l</i> 47'52	<i>h</i> 44'08	<i>l</i> 48'60	<i>l</i> 45'84	<i>l</i> 46'46	<i>h</i> 46'90	<i>l</i> 48'68	<i>l</i> 49'02	<i>l</i> 47'86	<i>h</i> 44'34	
		<i>h</i> 46'66						<i>l</i> 49'82	<i>l</i> 45'06	<i>l</i> 47'46	
	47'03	46'52	48'76	45'93	46'18	46'83	48'49	48'25	47'43	46'38	
At CXXII											
<i>January and February 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 13'	187° 13'	14° 25'	194° 25'	21° 36'	201° 36'	28° 49'	208° 48'	
CXX & CXVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 5'' 75 <i>w</i> = 8 48 $\frac{1}{w}$ = 0 12 <i>C</i> = 49° 25' 5'' 77
	<i>l</i> 4'90	<i>l</i> 7'00	<i>l</i> 5'72	<i>l</i> 7'14	<i>l</i> 1'92	<i>l</i> 6'00	<i>l</i> 4'30	<i>h</i> 8'60	<i>h</i> 6'06	<i>l</i> 5'02	
	<i>l</i> 6'16	<i>l</i> 5'98	<i>l</i> 4'62	<i>l</i> 4'04	<i>h</i> 5'46	<i>l</i> 5'30	<i>l</i> 3'96	<i>h</i> 6'20	<i>h</i> 5'64	<i>l</i> 5'94	
	<i>l</i> 4'80	<i>l</i> 6'46	<i>h</i> 7'06	<i>l</i> 9'12	<i>h</i> 5'78	<i>l</i> 4'54	<i>l</i> 5'04	<i>h</i> 5'88	<i>l</i> 4'88	<i>l</i> 5'90	
				<i>l</i> 8'80	<i>l</i> 5'26			<i>h</i> 7'38			
				<i>l</i> 7'22	<i>l</i> 5'56						
	5'29	6'48	5'80	7'26	4'80	5'28	4'43	7'02	5'53	5'62	



<i>At CXXII—(Continued)</i>											
<i>January and February 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 13'	187° 13'	14° 25'	194° 25'	21° 36'	201° 36'	28° 49'	208° 48'	
CXXVIII & CXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 24".51 <i>w</i> = 6.84 $\frac{1}{w}$ = 0.15 <i>C</i> = 57° 48' 24".51
	<i>l</i> 25.42	<i>l</i> 21.48	<i>l</i> 25.62	<i>l</i> 24.60	<i>l</i> 27.14	<i>l</i> 25.96	<i>l</i> 22.80	<i>h</i> 22.36	<i>h</i> 23.08	<i>l</i> 27.86	
	<i>l</i> 24.26	<i>l</i> 25.64	<i>l</i> 23.18	<i>l</i> 24.52	<i>h</i> 24.22	<i>l</i> 24.98	<i>l</i> 25.18	<i>h</i> 24.32	<i>l</i> 25.50	<i>l</i> 25.84	
	<i>l</i> 26.62	<i>l</i> 23.72	<i>h</i> 23.24	<i>l</i> 21.70	<i>h</i> 24.96	<i>l</i> 26.92	<i>l</i> 22.92	<i>h</i> 23.58	<i>l</i> 25.44	<i>l</i> 23.70	
		<i>l</i> 25.26		<i>l</i> 22.48	<i>l</i> 26.76					<i>h</i> 24.82 <i>h</i> 22.12	
	25.43	24.03	24.01	23.33	25.77	25.95	23.63	23.42	24.67	24.87	
CXXI & CXXIII	<i>h</i> 25.18	<i>l</i> 29.68	<i>l</i> 30.18	<i>h</i> 27.30	<i>l</i> 24.82	<i>l</i> 26.70	<i>l</i> 27.40	<i>h</i> 29.14	<i>h</i> 27.48	<i>l</i> 25.02	<i>M</i> = 27".15 <i>w</i> = 7.38 $\frac{1}{w}$ = 0.14 <i>C</i> = 49° 29' 27".14
	<i>h</i> 26.52	<i>l</i> 27.22	<i>l</i> 28.80	<i>h</i> 26.00	<i>h</i> 27.72	<i>l</i> 27.28	<i>l</i> 27.46	<i>h</i> 27.78	<i>l</i> 28.50	<i>l</i> 27.08	
	<i>h</i> 25.30	<i>l</i> 27.32	<i>h</i> 25.78	<i>l</i> 26.40	<i>h</i> 25.18	<i>l</i> 26.88	<i>l</i> 27.94	<i>h</i> 26.86	<i>l</i> 28.72	<i>h</i> 26.04	
		<i>l</i> 28.70	<i>h</i> 27.16	<i>l</i> 27.68	<i>h</i> 23.38	<i>l</i> 25.94				<i>h</i> 28.26	
	25.67	28.23	27.98	26.85	25.41	26.95	27.60	27.93	28.23	26.60	
CXXIII & CXXV	<i>h</i> 16.60	<i>l</i> 14.04	<i>l</i> 11.70	<i>h</i> 11.64	<i>h</i> 17.70	<i>h</i> 15.44	<i>l</i> 17.62	<i>h</i> 15.52	<i>h</i> 15.12	<i>h</i> 16.54	<i>M</i> = 15".26 <i>w</i> = 4.68 $\frac{1}{w}$ = 0.21 <i>C</i> = 56° 18' 15".23
	<i>h</i> 16.90	<i>l</i> 13.12	<i>l</i> 13.74	<i>h</i> 17.02	<i>h</i> 17.12	<i>h</i> 15.18	<i>l</i> 16.16	<i>h</i> 14.80	<i>l</i> 13.94	<i>h</i> 15.36	
	<i>h</i> 16.48	<i>l</i> 15.24	<i>h</i> 17.12	<i>l</i> 12.72	<i>h</i> 18.62	<i>h</i> 15.86	<i>l</i> 16.10	<i>h</i> 15.30	<i>l</i> 15.24	<i>h</i> 14.54	
		<i>l</i> 14.18	<i>h</i> 13.48	<i>l</i> 11.14	<i>h</i> 16.60					<i>h</i> 16.60	
			<i>h</i> 14.24	<i>l</i> 11.74	<i>h</i> 16.58					<i>h</i> 13.82 <i>h</i> 16.70 <i>h</i> 12.62	
	16.66	14.15	14.06	12.96	17.22	15.49	16.63	15.21	14.77	15.48	
<i>At CXXIII</i>											
<i>January 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXVII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 48'	
CXXVII & CXXV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 37".08 <i>w</i> = 7.88 $\frac{1}{w}$ = 0.13 <i>C</i> = 46° 34' 37".10
	<i>l</i> 37.04	<i>l</i> 38.92	<i>l</i> 35.82	<i>l</i> 37.50	<i>l</i> 36.48	<i>l</i> 39.08	<i>l</i> 37.14	<i>l</i> 37.04	<i>l</i> 36.40	<i>l</i> 36.34	
	<i>l</i> 34.52	<i>l</i> 38.72	<i>l</i> 37.68	<i>l</i> 36.66	<i>l</i> 35.28	<i>l</i> 39.86	<i>l</i> 37.42	<i>l</i> 36.38	<i>l</i> 37.02	<i>l</i> 36.74	
	<i>l</i> 36.90	<i>l</i> 36.90	<i>l</i> 40.86	<i>l</i> 36.60	<i>l</i> 37.24	<i>l</i> 37.26	<i>h</i> 34.08	<i>l</i> 36.34	<i>l</i> 37.38	<i>l</i> 35.76	
			<i>l</i> 39.14			<i>l</i> 38.56	<i>h</i> 36.64				
	36.15	38.18	38.38	36.92	36.33	38.69	36.32	36.59	36.93	36.28	

At CXXIII—(Continued.)

January 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CXXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXV & CXXII	"	"	"	"	"	"	"	"	"	"	M = 53''60 w = 6.30 $\frac{1}{w}$ = 0.16 C = 46° 30' 53''57
	l 52°04	l 54°14	l 55°08	l 52°86	h 53°74	l 51°78	l 52°78	h 55°04	l 54°26	l 55°64	
	l 53°68	l 53°88	l 52°44	l 54°16	h 54°42	l 49°90	l 50°52	h 55°20	l 54°28	l 54°52	
	l 53°32	l 56°26	l 51°92	l 53°22	l 50°74	l 52°66	h 55°32	l 53°74	l 53°74	l 54°72	
		l 50°76		l 53°18	l 51°90	h 56°14					
	53°31	54°76	52°55	53°41	53°02	51°56	53°69	54°66	54°09	54°96	
CXXII & CXXI	l 30°20	l 28°16	l 28°98	l 30°50	h 28°32	l 31°00	l 31°64	h 30°82	l 29°52	l 28°38	M = 29''94 w = 6.96 $\frac{1}{w}$ = 0.14 C = 63° 16' 29''95
	l 29°46	l 27°12	l 30°06	l 28°10	h 29°88	l 31°26	l 32°70	h 30°52	l 31°22	l 28°52	
	l 30°76	l 27°86	l 29°50	l 31°98	l 32°02	l 29°92	h 32°22	l 28°80	l 30°34	l 29°26	
		l 30°08	l 32°10	l 29°40		h 29°30					
	30°14	27°71	29°66	30°67	29°91	30°73	31°47	30°05	30°36	28°72	
CXXI & CXXIV	l 13°64	l 14°60	l 9°88	l 13°66	h 15°90	l 13°86	l 9°88	h 12°90	l 13°24	l 12°06	M = 13''25 w = 7.20 $\frac{1}{w}$ = 0.14 C = 64° 23' 13''24
	l 13°36	l 14°52	l 12°86	l 13°30	h 15°24	l 14°46	l 13°92	h 11°34	l 11°94	l 13°94	
	l 14°90	l 11°94	l 13°74	l 11°54	h 14°60	l 13°34	h 14°02	h 11°16	l 12°20	l 14°62	
		l 13°30				h 12°50					
	13°97	13°69	12°45	12°83	15°25	13°89	12°58	11°80	12°46	13°54	
CXXIV & CXXVI	l 48°46	l 46°72	l 51°90	l 49°56	h 47°56	l 49°30	l 51°34	h 47°14	l 48°42	l 49°08	M = 48''74 w = 12.10 $\frac{1}{w}$ = 0.08 C = 68° 58' 48''74
	l 47°86	l 48°94	l 46°58	l 49°62	h 49°62	l 48°68	l 49°36	h 48°30	l 49°18	l 47°02	
	l 50°72	l 48°64	l 48°78	l 49°96	h 47°44	l 49°44	h 48°48	h 48°52	l 50°24	l 46°46	
	l 47°54	l 49°02				h 48°80			l 48°60		
	48°65	48°10	49°07	49°71	48°21	49°14	49°50	47°99	49°28	47°79	
CXXVI & CXXVII	l 58°04	l 57°76	l 57°70	l 57°86	h 55°48	l 56°42	l 56°48	l 56°64	l 57°42	l 59°56	M = 57''00 w = 5.95 $\frac{1}{w}$ = 0.17 C = 70° 15' 56''98
	l 57°06	l 56°72	l 59°04	l 58°22	h 53°12	l 56°32	l 56°02	l 58°38	l 56°94	l 59°82	
	l 55°16	l 56°70	l 54°28	l 57°94	h 56°10	l 56°54	h 54°28	l 57°58	l 55°82	l 58°82	
	l 58°12	l 56°80		l 56°18	l 54°52	l 56°24	h 55°26				
	57°10	57°06	56°96	58°01	55°27	56°43	55°51	57°53	56°73	59°40	

<i>At CXXIV</i>											
<i>January 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 49'	
CXXVI & CXXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 12''·96 <i>w</i> = 19·72 $\frac{1}{w}$ = 0·05 <i>C</i> = 66° 10' 12''·97
	l 12° 90'	l 13° 24'	l 12° 42'	h 12° 84'	l 16° 28'	l 11° 90'	l 14° 04'	l 13° 46'	h 13° 46'	h 12° 90'	
	l 13° 26'	l 13° 58'	l 11° 72'	h 11° 18'	l 12° 50'	l 13° 34'	l 13° 80'	l 12° 62'	h 12° 52'	h 12° 80'	
	l 13° 30'	l 11° 80'	l 12° 30'	h 12° 38'	l 13° 62'	l 12° 38'	l 13° 48'	l 12° 92'	h 13° 44'	h 12° 84'	
				l 13° 40'							
	13° 15'	12° 87'	12° 15'	12° 13'	13° 95'	12° 54'	13° 77'	13° 00'	13° 14'	12° 85'	
CXXIII & CXXI	l 2° 76'	l 3° 96'	l 2° 08'	l 3° 26'	l 2° 34'	l 1° 16'	l 0° 66'	l 3° 30'	l 4° 76'	l 4° 50'	<i>M</i> = 3''·35 <i>w</i> = 7·38 $\frac{1}{w}$ = 0·14 <i>C</i> = 65° 52' 3''·33
	l 5° 52'	l 5° 40'	l 2° 72'	l 3° 38'	l 1° 58'	l 6° 40'	l 2° 78'	l 3° 10'	l 3° 90'	l 3° 36'	
	l 4° 54'	l 5° 52'	l 2° 56'	l 2° 86'	l 0° 18'	l 3° 78'	l 4° 82'	l 4° 64'	l 2° 02'	l 2° 22'	
				l 1° 32'	l 4° 08'	l 3° 14'					
	4° 27'	4° 96'	2° 45'	3° 17'	1° 36'	3° 86'	2° 85'	3° 68'	3° 56'	3° 36'	
<i>At CXXV</i>											
<i>January 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	206° 48'	
CXXII & CXXIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 51''·78 <i>w</i> = 7·75 $\frac{1}{w}$ = 0·13 <i>C</i> = 77° 10' 51''·78
	l 52° 58'	l 50° 66'	l 48° 88'	l 52° 16'	l 53° 26'	h 52° 96'	l 50° 50'	l 54° 08'	l 50° 26'	l 50° 36'	
	l 50° 76'	l 50° 12'	l 49° 66'	l 52° 08'	l 52° 18'	h 53° 24'	l 53° 70'	l 52° 86'	l 53° 64'	l 53° 04'	
	l 51° 48'	l 50° 18'	l 51° 58'	l 50° 86'	l 52° 14'	h 51° 96'	l 50° 74'	l 52° 68'	l 51° 58'	l 53° 30'	
							l 53° 18'		l 50° 52'	h 51° 98'	
	51° 61'	50° 32'	50° 04'	51° 70'	52° 53'	52° 72'	52° 03'	53° 21'	51° 50'	52° 17'	

At CXXV—(Continued.)											
January 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXXII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 48'	
CXXIII & CXXVII	"	"	"	"	"	"	"	"	"	"	M = 31'' 45 w = 11 67 $\frac{1}{w}$ = 0 09 C = 73° 57' 31'' 45
	l 31' 62	l 33' 06	l 32' 68	l 30' 38	l 31' 92	h 31' 26	h 29' 42	l 30' 80	l 31' 10	l 32' 76	
	l 32' 70	l 31' 44	l 30' 66	l 32' 84	l 30' 72	h 29' 68	l 30' 46	l 31' 92	l 28' 94	l 33' 06	
	l 31' 72	l 32' 02	l 29' 42	l 33' 40	l 31' 46	h 30' 04	l 32' 08	l 31' 32	l 30' 20	l 31' 80	
			l 31' 48	l 32' 56					h 32' 66		
	32' 01	32' 17	31' 06	32' 30	31' 37	30' 33	30' 65	31' 35	30' 73	32' 54	
At CXXVI											
January 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXIX & CXXVIII	"	"	"	"	"	"	"	"	"	"	M = 47'' 83 w = 7 01 $\frac{1}{w}$ = 0 14 C = 51° 18' 47'' 82
	l 45' 52	l 45' 72	l 48' 84	l 48' 66	l 47' 82	l 49' 98	l 47' 76	h 49' 20	l 46' 88	l 46' 32	
	l 45' 96	l 48' 00	l 47' 58	h 48' 42	l 48' 46	l 49' 96	l 48' 08	h 46' 34	l 49' 02	l 45' 92	
	l 46' 58	l 46' 56	l 46' 94	h 49' 08	l 46' 54	l 49' 78	l 47' 96	h 47' 22	l 48' 44	l 46' 40	
	l 46' 84						h 50' 52				
	l 49' 80										
	46' 94	46' 76	47' 79	48' 72	47' 61	49' 91	47' 93	48' 32	48' 11	46' 21	
CXXVIII & CXXVII	l 48' 90	l 45' 78	l 43' 52	l 43' 80	l 43' 70	l 44' 60	l 43' 32	h 44' 80	l 44' 26	l 43' 52	M = 44'' 73 w = 7 90 $\frac{1}{w}$ = 0 13 C = 59° 32' 44'' 73
	l 47' 04	l 46' 42	l 44' 06	h 42' 70	l 44' 40	l 43' 52	l 44' 26	h 46' 16	l 44' 72	l 46' 20	
	l 47' 04	l 46' 36	l 44' 18	h 42' 42	l 45' 12	l 44' 54	l 43' 24	h 44' 80	l 44' 42	l 45' 58	
	l 45' 14			l 44' 44							
	l 44' 62			l 44' 74							
	46' 55	46' 19	43' 92	43' 62	44' 41	44' 22	43' 61	45' 25	44' 47	45' 10	

At CXXVI—(Continued.)											
<i>January 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle reading, telescope being set on CXXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXVII & CXXIII	"	"	"	"	"	"	"	"	"	"	M = 35''·08 w = 9·90 $\frac{1}{w}$ = 0·10 C = 57° 24' 35''·08
	l 33° 98	l 35° 94	l 35° 22	l 35° 98	l 36° 20	l 33° 54	l 36° 50	h 35° 88	l 33° 40	l 33° 30	
	l 34° 96	l 34° 14	l 36° 40	h 36° 26	l 34° 88	l 35° 32	l 35° 28	h 35° 58	l 33° 98	l 34° 36	
	l 33° 54	l 34° 82	l 34° 14	h 36° 52	l 36° 38	l 34° 58	l 36° 88	h 36° 10	l 34° 86	l 33° 52	
	34° 16	34° 97	35° 25	36° 25	35° 82	34° 48	36° 22	35° 85	34° 08	33° 73	
CXXIII & CXXIV	l 58° 88	l 57° 04	l 56° 64	h 56° 96	l 59° 24	l 60° 80	l 62° 18	h 57° 36	l 59° 28	l 60° 26	M = 58''·37 w = 5·38 $\frac{1}{w}$ = 0·19 C = 44° 50' 58''·37
	l 57° 62	l 59° 28	l 55° 62	h 57° 78	l 59° 54	l 58° 80	l 61° 68	h 56° 50	l 58° 20	l 59° 18	
	l 59° 20	l 57° 42	l 56° 74	h 58° 20	l 59° 90	l 59° 12	l 59° 52	h 55° 46	l 56° 22	l 58° 66	
						l 59° 90	h 57° 50	l 58° 36			
						h 58° 28	h 58° 50				
	58° 57	57° 91	56° 33	57° 65	59° 56	59° 57	60° 01	56° 71	58° 02	59° 37	
At CXXVII											
<i>December 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	147° 4'	327° 5'	154° 15'	334° 15'	161° 28'	341° 28'	168° 40'	348° 40'	175° 52'	355° 52'	
CXXV & CXXIII	"	"	"	"	"	"	"	"	"	"	M = 51''·80 w = 6·01 $\frac{1}{w}$ = 0·17 C = 59° 27' 51''·80
	l 49° 14	l 51° 06	l 53° 42	l 53° 96	l 51° 90	l 51° 14	l 51° 86	l 50° 50	l 51° 66	l 48° 78	
	l 49° 56	l 51° 84	l 55° 02	l 52° 90	l 52° 10	l 51° 50	l 52° 80	l 51° 58	l 50° 40	l 51° 74	
	l 51° 10	l 51° 32	l 53° 54	l 53° 76	l 52° 76	l 52° 06	l 51° 26	l 51° 30	l 51° 76	l 51° 40	
									l 50° 70		
	49° 93	51° 71	53° 99	53° 54	52° 25	51° 57	51° 97	51° 13	51° 27	50° 66	

At CXXVII—(Continued.)

December 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CXXV										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	147° 4'	327° 5'	154° 15'	334° 15'	161° 28'	341° 28'	168° 40'	348° 40'	175° 52'	355° 52'	
CXXIII & CXXVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 27" 97 <i>w</i> = 6 13 $\frac{1}{w}$ = 0 16 <i>C</i> = 52° 19' 27" 98
	l 31' 94 l 31' 38 l 28' 44 l 27' 82	l 27' 54 l 28' 66 l 27' 84	l 29' 44 l 27' 32 l 27' 92	l 27' 06 l 25' 46 l 26' 82	l 27' 30 l 26' 68 l 27' 96	l 28' 66 l 27' 72 l 28' 26	l 26' 42 l 27' 08 l 26' 74	l 27' 20 l 28' 36 l 27' 16	l 27' 42 l 27' 70 l 27' 02	l 31' 28 l 29' 06 l 29' 46	
	29° 90	28° 01	28° 23	26° 45	27° 31	28° 21	26° 75	27° 57	27° 38	29° 93	
CXXVI & CXXVIII	l 40° 06	l 37° 96	l 40° 56	l 38° 22	l 39° 98	l 38° 26	l 38° 54	l 39° 24	l 39° 34	l 39° 02	<i>M</i> = 39" 13 <i>w</i> = 18 72 $\frac{1}{w}$ = 0 05 <i>C</i> = 51° 27' 39" 12
	l 38' 88 l 40° 26 l 39° 70	l 39' 10 l 41° 46 l 38° 56	l 37' 12 l 36° 96 l 38° 56	l 41° 06 l 38° 96	l 40° 52 l 38° 30	l 39° 42 l 39° 36	l 37° 44 l 39° 06	l 38° 44 l 39° 08	l 39° 96 l 39° 30	l 38° 74 l 38° 88	
	39° 73	39° 56	38° 30	39° 41	39° 60	39° 01	38° 35	38° 92	39° 53	38° 88	
CXXVIII & R M	l 51° 62	l 56° 90	l 50° 90	l 55° 58	l 53° 02	l 53° 82	l 54° 06	l 55° 98	l 52° 56	l 53° 56	<i>M</i> = 53" 93 <i>w</i> = 5 39 $\frac{1}{w}$ = 0 19 <i>C</i> = 49° 41' 53" 91
	l 52° 44 l 52° 12	l 57° 04 l 54° 66	l 56° 14 l 55° 10	l 53° 66 l 55° 36	l 52° 72 l 52° 26	l 53° 62 l 52° 26	l 54° 50 l 54° 24	l 54° 60 l 54° 92	l 52° 78 l 53° 30 l 53° 06 l 52° 28	l 54° 56 l 53° 30	
	52° 06	56° 20	54° 05	54° 87	52° 87	53° 23	54° 27	55° 17	52° 80	53° 81	
R M & CXXX	l 31° 04	l 29° 90	l 31° 36	l 30° 92	l 31° 20	l 32° 06	l 31° 38	l 30° 20	l 30° 98	l 29° 48	<i>M</i> = 30" 65 <i>w</i> = 14 57 $\frac{1}{w}$ = 0 07 <i>C</i> = 0° 5' 30" 66
	l 31° 08 l 31° 16	l 28° 58 l 30° 18	l 29° 64 l 29° 40	l 30° 80 l 29° 84	l 31° 36 l 30° 84	l 29° 94 l 30° 78	l 30° 48 l 29° 66	l 31° 38 l 31° 36	l 33° 20 l 31° 68 l 32° 16	l 29° 04 l 30° 46	
	31° 09	29° 55	30° 13	30° 52	31° 13	30° 93	30° 51	30° 98	32° 01	29° 66	

At CXXVIII											
<i>November and December 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXIX										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 50'	208° 49'	
CXXIX & CXXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 55".61 <i>w</i> = 4.63 $\frac{1}{w}$ = 0.22 <i>C</i> = 54° 56' 55".60
	h 53.06	l 55.56	l 54.94	l 53.98	h 54.68	h 55.36	l 59.72	l 55.50	l 57.66	h 55.94	
	l 53.82	l 53.04	l 55.30	l 57.92	h 55.52	h 56.62	l 58.06	l 53.28	l 57.08	h 56.10	
	l 55.02	l 54.64	l 53.88	l 54.78	h 54.38	h 56.96	l 57.22	l 57.02	l 57.06	h 55.68	
	l 55.22	h 53.02		l 52.60			l 58.76	l 54.60			
	h 55.12	h 54.42		l 55.04							
	54.45	54.14	54.71	54.86	54.86	56.31	58.44	55.10	57.27	55.91	
CXXXI & CXXXII	l 52.04	l 49.84	l 52.04	l 52.78	h 52.70	h 50.06	l 50.52	l 49.96	l 50.16	h 51.88	<i>M</i> = 51".30 <i>w</i> = 9.96 $\frac{1}{w}$ = 0.10 <i>C</i> = 69° 41' 51".30
	l 50.98	l 52.92	l 51.84	l 50.96	h 52.48	h 49.16	l 52.04	l 52.32	l 50.56	h 52.36	
	l 50.72	l 52.40	l 53.14	l 51.36	h 51.36	h 49.32	l 51.58	l 49.98	l 50.42	h 49.96	
		l 53.16									
	51.25	52.08	52.34	51.70	52.18	49.51	51.38	50.75	50.38	51.40	
CXXXII & CXXX	Circle readings, telescope being set on CXXXII										<i>M</i> = 3".37 <i>w</i> = 8.61 $\frac{1}{w}$ = 0.12 <i>C</i> = 69° 4' 3".38
	0° 1'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXXII & CXXX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 3".37 <i>w</i> = 8.61 $\frac{1}{w}$ = 0.12 <i>C</i> = 69° 4' 3".38
	l 3.72	l 5.02	l 1.90	l 2.86	l 4.46	l 2.12	l 4.32	l 1.82	l 4.74	l 4.28	
	l 2.46	l 4.36	l 2.10	l 3.10	l 4.70	l 3.86	h 3.38	l 2.58	l 3.46	l 3.26	
	l 2.20	l 6.82	l 0.96	h 4.24	l 4.52	l 4.92	h 3.06	l 1.64	l 4.20	l 3.54	
		l 4.80									
		h 2.14									
		h 2.52									
	2.79	4.28	1.65	3.40	4.56	3.63	3.59	2.01	4.13	3.69	
CXXX & CXXXVII	l 22.76	l 18.14	l 24.36	l 23.84	l 20.20	l 26.74	l 23.48	l 24.58	l 21.90	l 23.74	<i>M</i> = 22".54 <i>w</i> = 5.14 $\frac{1}{w}$ = 0.19 <i>C</i> = 40° 28' 22".53
	l 23.42	l 20.30	l 23.02	h 20.62	l 21.22	l 23.22	h 22.06	l 22.96	l 22.74	l 23.74	
	l 23.50	l 21.12	l 24.30	h 21.70	l 20.86	l 23.30	h 20.12	l 23.20	l 21.90	l 24.92	
		l 21.38		h 22.52		l 23.32	h 21.86			l 22.00	
		h 20.64				l 22.18					
	23.23	20.32	23.89	22.17	20.76	23.75	21.88	23.58	22.18	23.60	

At CXXVIII—(Continued.)											
<i>November and December 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXVII & CXXVI	"	"	"	"	"	"	"	"	"	"	M = 37".88 w = 6.82 $\frac{1}{w}$ = 0.15 C = 68° 59' 37".88
	l 40.68	h 37.30	l 38.34	h 36.86	l 38.12	l 35.00	l 37.66	l 36.66	l 38.58	l 36.62	
	l 39.22	h 37.44	l 37.24	l 36.26	l 36.06	l 37.32	h 39.96	l 35.50	l 38.88	l 36.72	
	l 38.42	h 38.36	l 38.42	l 38.72	l 39.30	l 36.78	h 40.30	l 38.88	l 41.12	l 36.88	
	39.44	37.70	38.00	37.28	37.49	36.37	39.31	37.37	39.08	36.74	
CXXVI & CXXIX	l 7.32	l 6.12	l 9.88	h 10.30	l 11.38	l 8.90	l 10.04	l 9.30	l 9.82	l 7.50	M = 8".81 w = 7.86 $\frac{1}{w}$ = 0.13 C = 56° 49' 8".82
	l 8.72	l 8.12	l 9.72	l 9.44	l 12.40	l 9.66	l 7.96	l 10.30	l 8.54	l 6.58	
	l 8.16	h 8.06	l 7.54	l 8.54	l 8.28	l 9.64	h 8.56	l 9.68	l 7.18	l 7.38	
		l 9.24		l 9.20		h 9.18		l 8.48			
	8.07	7.43	9.10	9.43	10.32	9.40	8.94	9.76	8.51	7.15	
At CXXIX											
<i>November 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 50'	208° 50'	
CXXXI & CXXVIII	"	"	"	"	"	"	"	"	"	"	M = 36".94 w = 21.70 $\frac{1}{w}$ = 0.05 C = 71° 58' 36".94
	h 37.62	l 36.38	l 36.38	l 35.76	l 37.42	l 38.06	l 36.28	l 36.12	h 36.64	h 37.64	
	h 36.84	l 35.44	l 35.58	l 36.44	l 36.50	l 37.54	l 35.62	l 37.68	h 38.24	h 37.86	
	h 37.94	l 36.36	l 37.18	l 36.90	l 37.46	l 37.14	l 37.00	l 37.34	h 37.88	h 36.94	
	37.47	36.06	36.38	36.37	37.13	37.58	36.30	37.05	37.59	37.48	



At CXXIX—(Continued.)											
<i>January 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 50'	208° 50'	
CXXVIII & CXXVI	"	"	"	"	"	"	"	"	"	"	
	h59°68	h61°06	l59°72	l60°16	l60°70	l62°82	l60°42	l60°02	l60°86	l59°54	M = 61''·44 w = 8·17 $\frac{1}{w}$ = 0·12 C = 71° 51' 61''·40
	h60°60	h63°54	l59°42	l60°08	l62°24	l63°56	l59°02	l59°20	l58°72	l59°88	
	h61°40	h62°68	l58°90	l61°64	l62°60	l63°06	l62°92	l60°36	l59°20	l59°98	
	h63°30	h63°58	l61°38	l62°34			l61°86	l62°98	l62°34	l62°74	
h63°20		l61°60					l62°08	l62°44	l63°28		
	61°64	62°72	60°20	61°06	61°85	63°15	61°06	60°93	60°71	61°08	
At CXXX											
<i>December 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 18'	187° 18'	14° 25'	194° 25'	21° 36'	201° 36'	28° 49'	208° 49'	
CXXVII & CXXVIII	"	"	"	"	"	"	"	"	"	"	
	h13°62	l13°96	h11°38	l13°66	l13°02	l14°54	l13°56	l10°54	l14°96	l13°16	M = 13''·09 w = 16·17 $\frac{1}{w}$ = 0·06 C = 89° 44' 13''·09
	l13°60	l12°90	l12°36	l12°48	l12°78	l14°80	l15°18	l12°30	l11°86	l12°62	
	l11°94	l12°42	l14°44	l13°88	l12°48	l13°38	h11°74	l12°64	l12°40	l14°20	
			l13°02				l12°48		l13°78		
	13°05	13°09	12°80	13°34	12°76	14°24	13°24	11°83	13°25	13°33	
CXXVIII & CXXXII	h11°80	l13°18	l15°04	l12°66	l13°30	l12°36	l13°80	l13°64	l14°16	l11°62	M = 13''·62 w = 14·78 $\frac{1}{w}$ = 0·07 C = 60° 53' 13''·62
	l14°96	l11°82	l13°06	l13°28	l13°16	l14°20	l11°50	l14°94	l15°92	l13°70	
	l13°34	l15°56	l12°78	l13°30	l13°96	l13°94	h13°20	l13°38	l15°24	l13°44	
	l14°68	l14°78					l13°42				
	13°70	13°84	13°63	13°08	13°47	13°50	12°98	13°99	15°11	12°92	

At CXXXI											
<i>November 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXXIII & CXXXIV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 21'' 04 <i>w</i> = 8 '21 $\frac{1}{w}$ = 0 '12 <i>C</i> = 49° 27' 21'' 02
	h20'40	l19'80	h21'54	h23'16	l22'78	l22'06	h17'28	l21'20	h21'42	l21'06	
	h21'48	l22'94	h22'36	h21'96	l20'98	l22'38	h20'54	h17'46	h20'12	l21'48	
	l20'14	l20'02	h21'36	l21'64	l20'00	h22'28	h22'10	h21'40	h19'12	l21'20	
		l21'60					l18'12	h20'48			
	20'67	21'09	21'75	22'25	21'25	22'24	19'51	20'14	20'22	21'25	
CXXXIV & CXXXII	h32'68	l32'66	h31'38	h29'30	l32'04	l33'60	h34'02	l32'12	h33'74	l32'48	<i>M</i> = 32'' 64 <i>w</i> = 8 '16 $\frac{1}{w}$ = 0 '12 <i>C</i> = 34° 18' 32'' 62
	h32'26	l31'06	h29'90	h30'30	l33'48	l33'60	h31'98	l33'66	h33'22	l32'72	
	l31'06	l31'84	h30'82	l31'48	l34'30	h32'74	l36'00	h31'58	h35'08	l32'76	
			h32'62	h33'62			h33'74				
			h32'52	h32'78							
	32'00	31'85	31'45	31'50	33'27	33'31	33'94	32'45	34'01	32'65	
CXXXII & CXXXVIII	h42'42	l43'40	l38'52	l43'56	l40'72	l44'16	h43'62	l42'38	h44'06	l42'86	<i>M</i> = 42'' 72 <i>w</i> = 7 '96 $\frac{1}{w}$ = 0 '13 <i>C</i> = 54° 23' 42'' 71
	h44'08	l42'48	l41'28	l42'66	l42'54	l41'82	h42'58	l43'16	h41'68	l43'38	
	l44'96	l42'48	l39'88	l42'66	l42'62	h44'68	l42'34	l42'86	h45'14	l43'18	
			l41'46			h43'98		l42'42	l41'04		
	43'82	42'79	40'29	42'96	41'96	43'66	42'85	42'71	42'98	43'14	
CXXVIII & CXXIX	h28'48	l30'66	l33'04	l31'72	l30'50	l27'36	h27'46	l30'20	h25'50	l26'82	<i>M</i> = 28'' 25 <i>w</i> = 3 '34 $\frac{1}{w}$ = 0 .30 <i>C</i> = 53° 4' 28'' 25
	h26'76	l29'80	l31'90	l30'34	l28'18	h28'12	h28'56	l27'66	h27'06	l27'06	
	l26'34	l29'68	l30'02	l28'70	l26'80	h26'52	l25'14	l26'24	h27'34	l27'82	
			l29'78		l26'62		l27'02	l26'20			
	27'19	30'05	31'19	30'25	28'03	27'33	27'05	27'58	26'63	27'23	

At CXXXII											
October and November 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXXX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 26'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXIX & CXXVIII	"	"	"	"	"	"	"	"	"	"	
	l 46° 78	l 43° 80	l 44° 58	l 47° 24	l 44° 16	l 46° 80	l 44° 04	h 44° 80	l 44° 92	l 44° 76	M = 44" 58
	l 44° 72	l 42° 82	l 41° 34	l 45° 02	l 43° 58	l 44° 28	l 45° 54	h 44° 10	l 43° 00	l 45° 76	w = 7 22
	l 45° 70	l 41° 50	l 43° 52	l 46° 44	l 43° 56	l 46° 02	l 45° 28	h 44° 88	l 43° 34	l 44° 60	$\frac{1}{w} = 0 \cdot 14$
		l 45° 12	l 42° 70	l 45° 08							C = 50° 2' 44" 57
	45° 73	43° 31	43° 04	45° 95	43° 77	45° 70	44° 95	44° 59	43° 75	45° 04	
CXXVIII & CXXXI	h 29° 42	h 26° 38	l 23° 44	l 20° 42	h 26° 66	h 27° 36	l 29° 74	h 26° 56	l 26° 44	l 24° 68	M = 16" 17
	h 27° 38	h 24° 54	l 26° 78	l 25° 12	h 25° 72	l 27° 00	l 26° 40	h 28° 66	l 26° 54	l 24° 58	w = 3 63
	h 27° 04	h 26° 16	l 21° 72	l 23° 46	h 27° 12	l 25° 88	l 25° 88	h 28° 32	l 28° 12	l 27° 16	$\frac{1}{w} = 0 \cdot 28$
	l 26° 46		l 23° 42	l 24° 46	l 28° 44		l 26° 14			l 25° 48	C = 55° 54' 26" 15
	27° 58	25° 69	23° 84	23° 46	26° 99	26° 75	27° 04	27° 85	27° 03	25° 48	
CXXXI & CXXXIII	h 21° 68	h 21° 00	h 22° 80	h 21° 48	h 22° 52	h 22° 06	l 21° 04	h 21° 74	l 22° 20	l 19° 68	M = 21" 80
	h 20° 76	h 22° 86	h 22° 32	l 24° 38	h 21° 36	h 22° 54	l 20° 58	h 22° 48	l 21° 34	l 21° 64	w = 14 94
	h 22° 02	h 22° 32	h 21° 76	l 21° 52	h 23° 84	h 23° 04	h 20° 52	h 21° 02	l 19° 98	l 20° 62	$\frac{1}{w} = 0 \cdot 07$
						h 21° 26				l 21° 26	C = 37° 25' 21" 78
	21° 49	22° 06	22° 29	22° 46	22° 57	22° 55	20° 85	21° 75	21° 17	20° 80	
CXXXIII & CXXXIV	l 40° 90	l 41° 18	h 42° 10	h 41° 22	h 39° 74	h 43° 22	l 43° 50	h 41° 40	l 41° 36	l 41° 94	M = 41" 69
	l 41° 68	l 41° 44	h 40° 62	l 40° 72	h 40° 96	h 43° 64	l 45° 64	h 40° 60	l 41° 50	l 41° 48	w = 8 33
	l 42° 08	l 40° 70	h 42° 50	l 41° 34	h 39° 24	h 42° 94	h 42° 08	h 42° 30	l 41° 94	l 41° 66	$\frac{1}{w} = 0 \cdot 12$
						h 42° 60					C = 54° 8' 41" 70
	41° 55	41° 11	41° 74	41° 09	39° 98	43° 27	43° 46	41° 43	41° 60	41° 69	
At CXXXIII											
November and December 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXXXV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXXV & CXXXVI	"	"	"	"	"	"	"	"	"	"	
	l 46° 74	l 48° 22	l 45° 04	l 46° 10	l 46° 48	l 47° 86	h 48° 06	l 47° 22	h 44° 12	l 46° 36	M = 46" 40
	l 47° 00	l 46° 24	h 45° 40	l 43° 94	l 46° 52	l 47° 32	l 49° 54	l 46° 82	h 44° 26	l 47° 58	w = 5 76
	l 46° 54	l 45° 02	h 44° 86	l 45° 28	l 47° 98	h 47° 26	l 48° 80	l 45° 98	h 45° 14	l 46° 68	$\frac{1}{w} = 0 \cdot 17$
		l 43° 84			l 45° 24				l 45° 64		C = 45° 45' 46" 39
	46° 76	45° 83	45° 10	45° 11	46° 56	47° 48	48° 80	46° 67	44° 79	46° 87	

At CXXXIII—(Continued.)											
<i>November and December 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXXXVI & CXXXIV	"	"	"	"	"	"	"	"	"	"	M = 10".07 w = 10.32 $\frac{1}{w} = 0.10$ C = 38° 50' 10".04
	l 9.80	l 7.42	l 9.90	l 10.62	l 9.90	l 10.98	h 9.86	l 10.62	h 11.28	l 7.98	
	l 7.46	l 9.86	h 11.72	l 9.66	l 8.46	l 9.66	l 10.50	l 9.00	h 11.44	l 7.18	
	l 8.14	l 9.66	h 12.34	l 9.92	l 10.64	h 10.94	l 10.42	l 9.94	h 10.90	l 9.88	
	l 11.88	l 10.70			l 10.66					l 9.20	
	l 10.44										
	9.54	9.41	11.32	10.07	9.92	10.53	10.26	9.85	11.21	8.56	
CXXXIV & CXXXII	l 60.82	l 62.78	l 62.46	l 62.94	l 59.72	l 61.62	h 59.42	l 62.14	h 60.36	h 63.02	M = 1".68 w = 5.08 $\frac{1}{w} = 0.20$ C = 36° 46' 1".67
	l 61.84	l 63.36	h 59.16	l 64.40	l 61.08	l 60.70	h 61.38	l 61.78	h 60.50	l 63.32	
	l 61.92	l 62.44	h 59.80	l 64.92	l 59.18	l 61.48	h 60.22	l 63.20	h 61.76	l 63.66	
			h 59.86	l 62.96	l 61.30		h 59.46				
	61.53	62.86	60.32	63.81	60.32	61.27	60.12	62.37	60.87	63.33	
CXXXII & CXXXI	l 47.56	l 43.10	l 42.30	l 43.40	l 44.96	l 43.16	h 49.62	l 44.14	h 48.88	h 47.72	M = 45".35 w = 3.39 $\frac{1}{w} = 0.29$ C = 58° 48' 45".34
	l 47.20	l 43.94	h 45.16	l 42.80	l 44.16	l 46.26	h 45.74	l 45.74	h 47.64	l 45.22	
	l 47.22	l 43.70	h 47.42	l 41.64	l 46.22	l 45.36	h 45.64	l 43.64	h 48.04	l 44.02	
	l 46.58	l 44.14	h 44.56	l 43.54	l 44.58	h 45.06	h 45.92			l 43.34	
			h 47.20								
	47.14	43.72	45.33	42.85	44.98	44.96	46.73	44.51	48.19	45.08	
At CXXXIV											
<i>November 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
CXXXII & CXXXI	"	"	"	"	"	"	"	"	"	"	M = 23".63 w = 11.12 $\frac{1}{w} = 0.09$ C = 54° 7' 23".64
	h 25.04	h 24.60	h 24.22	l 23.82	l 24.04	l 23.44	h 26.04	l 22.38	l 23.28	l 26.54	
	h 24.42	h 23.16	h 23.82	l 23.14	l 23.18	l 24.32	l 21.52	l 22.20	l 23.90	l 23.54	
	h 23.78	h 22.08	l 23.14	l 22.88	l 21.94	l 23.36	l 23.60	l 21.14	l 25.48	l 24.36	
					l 23.60	h 23.20	l 24.00			l 25.06	
	24.41	23.28	23.73	23.28	23.19	23.58	23.79	21.91	24.22	24.88	

At CXXXIV—(Continued.)											
<i>November 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
CXXXI & CXXXIII	"	"	"	"	"	"	"	"	"	"	
	<i>h</i> 51'18	<i>h</i> 50'24	<i>h</i> 52'92	<i>l</i> 53'14	<i>l</i> 52'64	<i>l</i> 54'42	<i>h</i> 52'54	<i>l</i> 53'38	<i>l</i> 50'28	<i>l</i> 49'60	<i>M</i> = 52''30
	<i>h</i> 52'54	<i>h</i> 51'70	<i>h</i> 52'18	<i>l</i> 53'36	<i>l</i> 51'30	<i>l</i> 52'80	<i>l</i> 54'44	<i>l</i> 51'92	<i>l</i> 51'14	<i>l</i> 52'40	<i>w</i> = 7.46
	<i>d</i> 50'17	<i>h</i> 52'22	<i>l</i> 52'38	<i>l</i> 52'60	<i>l</i> 52'42	<i>l</i> 55'28	<i>l</i> 53'34	<i>l</i> 52'54	<i>l</i> 51'88	<i>l</i> 51'90	$\frac{1}{w}$ = 0.13
					<i>h</i> 55'20	<i>l</i> 52'40					<i>C</i> = 34° 57' 52''31
	51'30	51'39	52'49	53'03	52'12	54'43	53'18	52'61	51'10	51'30	
CXXXIII & CXXXV	<i>h</i> 18'26	<i>l</i> 19'46	<i>h</i> 16'78	<i>l</i> 16'26	<i>l</i> 15'80	<i>l</i> 15'88	<i>h</i> 17'50	<i>l</i> 17'50	<i>l</i> 20'20	<i>l</i> 19'32	<i>M</i> = 17''70
	<i>h</i> 18'32	<i>l</i> 19'44	<i>h</i> 17'18	<i>l</i> 15'78	<i>l</i> 14'86	<i>l</i> 18'14	<i>l</i> 16'48	<i>l</i> 18'62	<i>l</i> 19'50	<i>l</i> 17'34	<i>w</i> = 4.74
	<i>l</i> 20'74	<i>l</i> 20'24	<i>l</i> 16'58	<i>l</i> 16'96	<i>l</i> 15'78	<i>l</i> 16'16	<i>l</i> 16'12	<i>l</i> 17'12	<i>l</i> 19'44	<i>l</i> 18'64	$\frac{1}{w}$ = 0.21
		<i>h</i> 18'60				<i>h</i> 19'86	<i>l</i> 16'62		<i>l</i> 18'38		<i>C</i> = 42° 18' 17''70
	19'11	19'44	16'85	16'33	15'48	17'51	16'68	17'75	19'38	18'43	
CXXXV & CXXXVI	<i>h</i> 36'84	<i>l</i> 33'26	<i>h</i> 35'26	<i>l</i> 35'90	<i>l</i> 36'38	<i>l</i> 35'60	<i>h</i> 35'26	<i>l</i> 35'60	<i>l</i> 36'38	<i>l</i> 34'48	<i>M</i> = 35''24
	<i>h</i> 36'06	<i>l</i> 35'02	<i>h</i> 36'18	<i>l</i> 36'78	<i>l</i> 36'08	<i>l</i> 34'70	<i>l</i> 34'70	<i>l</i> 36'40	<i>l</i> 33'52	<i>l</i> 35'30	<i>w</i> = 7.54
	<i>l</i> 35'24	<i>l</i> 33'32	<i>l</i> 36'52	<i>l</i> 35'58	<i>l</i> 36'58	<i>l</i> 35'02	<i>l</i> 33'56	<i>l</i> 37'10	<i>l</i> 31'90	<i>l</i> 32'72	$\frac{1}{w}$ = 0.13
									<i>l</i> 33'78		<i>C</i> = 41° 55' 35''23
	36'05	33'87	35'99	36'09	36'35	35'11	34'51	36'37	33'90	34'17	
At CXXXV											
<i>March 1857, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXVIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0'	180° 1'	7° 12'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
CXXXVIII & CXXXVII	"	"	"	"	"	"	"	"	"	"	
	<i>h</i> 5'92	<i>l</i> 4'98	<i>l</i> 5'80	<i>h</i> 7'62	<i>l</i> 7'96	<i>l</i> 6'44	<i>l</i> 8'86	<i>h</i> 7'96	<i>h</i> 7'00	<i>h</i> 6'14	<i>M</i> = 7''24
	<i>h</i> 7'30	<i>l</i> 7'16	<i>l</i> 7'56	<i>h</i> 5'82	<i>l</i> 7'92	<i>l</i> 7'46	<i>l</i> 8'82	<i>h</i> 7'08	<i>h</i> 6'74	<i>h</i> 7'56	<i>w</i> = 14.89
	<i>l</i> 8'10	<i>l</i> 6'38	<i>h</i> 7'18	<i>l</i> 5'52	<i>l</i> 7'78	<i>l</i> 7'90	<i>l</i> 8'46	<i>h</i> 8'42	<i>l</i> 6'76	<i>h</i> 7'14	$\frac{1}{w}$ = 0.07
	<i>l</i> 6'26	<i>l</i> 7'04	<i>h</i> 8'00	<i>l</i> 6'86			<i>l</i> 9'06				<i>C</i> = 86° 31' 7''24
			<i>h</i> 6'82								
	6'90	6'39	7'07	6'46	7'89	7'27	8'80	7'82	6'83	6'95	

At CXXXV—(Continued.)

\* March 1857, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.

† December 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CXXXVIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 1'	7° 12'	187° 13'	14° 24'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
* CXXXVII & CXXXVI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 16''·20  <i>w</i> = 9·72 $\frac{1}{w}$ = 0·10 <i>C</i> = 45° 22' 16''·18
	h 15·58	l 16·36	l 18·02	h 14·82	l 16·40	l 18·42	l 15·50	h 14·26	h 16·06	h 16·74	
	h 16·54	l 16·76	l 14·52	h 16·94	l 17·22	l 18·12	l 14·46	h 15·46	h 17·60	h 16·58	
	l 16·26	l 16·92	h 13·92	h 14·88	l 18·02	l 17·50	l 14·50	h 14·12	h 17·46	h 16·96	
			h 14·92	l 17·20		h 16·06	l 15·12	l 15·52			
			h 14·74			h 16·20					
			h 15·88			h 16·44					
	16·13	16·68	15·33	15·96	17·21	17·12	14·90	14·84	17·04	16·76	
† CXXXVI & CXXXIV	Circle readings, telescope being set on CXXXVI										<i>M</i> = 48''·27  <i>w</i> = 6·58 $\frac{1}{w}$ = 0·15 <i>C</i> = 35° 59' 48''·27
	0° 1'	180° 1'	7° 13'	187° 12'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
	"	"	"	"	"	"	"	"	"	"	
	h 50·34	h 48·22	l 47·52	h 48·72	l 46·18	l 49·96	l 49·70	l 47·92	l 48·00	l 47·80	
	h 50·66	h 47·86	l 47·00	h 49·04	l 46·32	l 48·46	l 50·34	l 47·78	l 47·52	l 46·40	
	h 49·66	l 47·90	l 48·12	h 47·62	l 47·00	l 47·58	l 49·48	l 45·68	l 47·94	l 47·14	
				l 48·42					h 50·26	h 50·38	
									h 49·14		
	50·22	47·99	47·55	48·45	46·50	48·67	49·84	47·13	47·82	48·52	
† CXXXIV & CXXXIII	h 44·68	h 45·48	l 46·52	h 45·90	l 48·80	l 46·38	l 47·86	l 46·12	l 47·44	l 50·06	<i>M</i> = 46''·60  <i>w</i> = 7·09 $\frac{1}{w}$ = 0·14 <i>C</i> = 53° 5' 46''·62
	h 45·10	h 46·20	l 48·02	h 45·20	l 47·40	l 45·96	l 48·82	l 47·56	l 46·70	l 50·66	
	h 45·40	l 44·96	l 45·00	l 45·58	l 47·16	l 48·30	l 45·54	l 47·66	l 47·42	l 48·88	
		l 44·86				l 45·30			h 44·56	h 46·36	
									h 46·62		
	45·06	45·55	46·10	45·56	47·79	46·88	46·88	47·11	47·19	47·86	

At CXXXVI												
*October and November 1858, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.												
†April 1857, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.												
Angle between	Circle readings, telescope being set CXXXIV										M = Mean of Groups w = Relative Weight C = Concluded Angle	
	0° 0'	180° 0'	7° 13'	187° 13'	14° 26'	194° 26'	21° 37'	201° 37'	28° 48'	206° 48'		
* CXXXIV & CXXXIII	"	"	"	"	"	"	"	"	"	"	M = 57''·39 w = 4·05 1/w = 0·25 C = 56° 55' 57''·39	
	l 57'60	l 55'78	l 56'42	l 56'80	h 55'74	h 57'24	l 60'82	l 59'84	l 60'14	h 57'62		
	l 57'30	l 55'40	l 57'62	l 55'92	h 57'10	h 60'76	l 58'84	l 59'88	l 56'10	h 56'00		
	l 57'94	l 57'66	l 54'98	l 55'48	h 55'78	h 59'54	l 57'90	l 59'68	l 55'58	h 54'80		
						l 58'36	l 59'62		h 57'00	h 55'88		
									h 57'52			
	57'61	56'28	56'34	56'07	56'21	58'98	59'30	59'80	57'27	56'08		
* CXXXIII & CXXXV	l 37'82	l 38'74	l 41'10	l 39'78	h 38'08	h 41'18	l 41'50	l 41'56	l 38'38	h 39'22	M = 39''·82 w = 11·30 1/w = 0·09 C = 45° 8' 39''·83	
	l 40'26	l 39'52	l 39'82	l 40'22	h 38'22	h 37'68	l 38'90	l 39'20	l 41'56	h 93'76		
	l 39'30	l 38'56	l 42'38	l 39'84	h 40'02	h 39'86	l 41'10	l 39'00	h 40'40	h 41'46		
						l 38'84	l 40'32		h 39'68	h 41'80		
	39'13	38'94	41'10	39'95	38'77	39'39	40'46	39'92	40'01	40'56		
+ CXXXV & CXXXVII	Circle readings, telescope being set on CXXXV										M = 33''·52 w = 8·07 1/w = 0·12 C = 87° 27' 33''·53	
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 36'	201° 37'	28° 49'	208° 49'		
	"	"	"	"	"	"	"	"	"	"		
	h 35'66	h 33'86	l 33'06	l 32'00	h 33'42	h 36'30	l 34'58	h 31'90	l 32'74	l 31'10		
	h 35'90	l 32'28	l 34'36	l 33'02	h 34'04	h 35'42	l 33'88	h 34'90	l 32'16	l 32'20		
	h 35'52	l 32'84	l 33'98	l 32'60	l 32'20	h 35'78	l 33'08	l 32'74	l 32'38	l 32'66		
	l 35'42			h 33'84		l 32'38	h 33'86	l 33'50		l 32'98		
				h 33'74		l 33'58		l 33'24				
	35'63	32'99	33'80	33'04	33'22	34'69	33'85	33'26	32'43	32'24		
+ CXXXVII & CXXXIX	h 56'74	h 57'54	l 57'50	l 60'12	h 55'82	h 55'38	l 57'02	h 58'82	l 57'00	l 57'06	M = 56''·87 w = 11·34 1/w = 0·09 C = 63° 6' 56''·86	
	h 55'90	l 57'58	l 57'12	l 58'20	h 55'08	h 55'32	l 57'40	l 56'18	l 57'74	l 57'84		
	h 56'58	l 57'44	l 57'56	l 58'42	l 57'44	h 55'04	l 57'72	l 56'46	l 57'78	l 57'82		
			h 56'56	l 56'30	l 54'36	h 55'48	l 56'28					
			h 55'16									
			h 56'74									
			h 55'52									
	56'41	57'52	57'39	57'25	56'16	55'03	56'91	56'94	57'51	57'57		

At CXXXVII											
April 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXXXVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 26'	21° 37'	201° 37'	28° 48'	208° 49'	
CXXXVI & CXXXV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 10''60 <i>w</i> = 8.04 $\frac{1}{w}$ = 0.12 <i>C</i> = 47° 10' 10''57
	l 10° 88	h 10° 04	d 12° 00	l 11° 36	h 11° 66	l 10° 22	h 11° 02	l 12° 04	h 12° 38	h 10° 60	
	l 10° 98	h 14° 74	h 9° 30	l 10° 74	l 7° 88	l 9° 80	h 11° 10	l 11° 36	h 10° 24	h 12° 24	
	l 10° 50	l 11° 80	h 9° 40	l 12° 16	l 7° 54	l 8° 70	h 7° 38	l 11° 42	h 11° 74	h 12° 14	
	l 10° 54	l 9° 32	h 9° 52		l 9° 44		h 9° 92		h 9° 66		
		l 9° 48			l 8° 20						
		l 10° 10									
	10° 73	10° 91	10° 06	11° 42	8° 94	9° 57	10° 08	11° 61	11° 01	11° 66	
CXXXV & CXXXVIII	d 48° 35	d 43° 50	d 48° 13	l 44° 74	l 47° 50	l 49° 04	h 48° 68	l 45° 34	h 45° 74	h 48° 02	<i>M</i> = 46''69 <i>w</i> = 4.90 $\frac{1}{w}$ = 0.20 <i>C</i> = 65° 28' 46''69
	l 46° 06	l 44° 70	h 47° 10	l 45° 46	l 47° 90	l 48° 54	h 46° 74	l 45° 06	h 47° 20	h 47° 34	
	h 47° 88	l 47° 24	h 45° 58	l 45° 38	l 46° 64	l 47° 68	h 49° 76	l 45° 24	h 46° 70	h 46° 48	
	h 47° 68	l 43° 84	h 44° 94				h 48° 82				
		l 45° 94	l 44° 52								
	47° 49	44° 84	46° 05	45° 19	47° 35	48° 42	48° 50	45° 21	46° 55	47° 28	
CXXXVIII & CXLI	d 22° 43	d 21° 68	l 20° 66	l 21° 32	l 22° 12	l 22° 20	h 21° 84	l 22° 48	l 23° 30	l 22° 58	<i>M</i> = 22''54 <i>w</i> = 15.84 $\frac{1}{w}$ = 0.06 <i>C</i> = 57° 6' 22''54
	l 21° 50	l 23° 30	h 22° 44	l 22° 50	l 22° 36	l 22° 10	h 25° 08	l 24° 84	l 22° 24	l 23° 30	
	h 21° 86	l 22° 84	h 21° 38	l 23° 16	l 22° 78	l 22° 58	h 23° 06	l 23° 00	l 24° 06	l 22° 10	
	h 20° 52	l 24° 14	l 22° 64				h 22° 58	l 24° 50			
		l 23° 14					h 19° 98				
							h 21° 96				
	21° 58	23° 02	78° 21	22° 33	22° 42	22° 29	22° 42	23° 71	23° 20	22° 66	
CXLI & CXL	l 12° 84	h 14° 46	h 12° 38	l 12° 44	h 8° 86	l 8° 76	d 10° 80	l 11° 70	l 12° 10	l 11° 22	<i>M</i> = 11''52 <i>w</i> = 7.91 $\frac{1}{w}$ = 0.13 <i>C</i> = 71° 18' 11''49
	l 13° 72	l 13° 16	h 10° 02	l 12° 98	h 10° 60	l 9° 36	h 11° 08	l 10° 74	l 11° 74	l 12° 46	
	h 13° 32	l 12° 24	h 10° 08	l 11° 52	l 12° 22	l 12° 76	h 9° 80	l 11° 54	l 11° 28	l 12° 00	
		l 9° 86	l 11° 60		l 10° 76	l 9° 14	l 12° 48				
		l 10° 72			l 10° 16	l 8° 82	l 12° 36				
	13° 29	12° 09	11° 02	12° 31	10° 52	9° 77	11° 30	11° 33	11° 71	11° 89	



At CXXXVII—(Continued.)											
<i>April 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 26'	21° 37'	201° 37'	28° 48'	206° 49'	
CXL & CXXXIX	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 47''·65 <i>w</i> = 8·40 $\frac{1}{w}$ = 0·12 <i>C</i> = 57° 3' 47''·66
	l 46° 96'	h l 44° 70'	l 46° 48'	l 50° 30'	h 47° 74'	l 49° 48'	d 48° 45'	l 48° 28'	l 47° 94'	l 47° 18'	
	l 47° 40'	h 46° 16'	h 47° 14'	l 46° 46'	l 51° 12'	l 46° 84'	h 49° 12'	l 47° 78'	l 47° 68'	l 45° 54'	
	l 46° 32'	l 47° 30'	h 47° 92'	l 47° 66'	l 48° 22'	l 46° 86'	h 48° 86'	l 47° 42'	l 47° 84'	l 46° 14'	
		l 47° 32'	l 47° 58'	l 46° 76'	l 49° 70'	l 49° 02'	l 49° 26'				
	46° 89'	46° 37'	47° 28'	47° 80'	49° 20'	48° 05'	48° 92'	47° 83'	47° 82'	46° 29'	
CXXXIX & CXXXVI	l 40° 34'	h l 41° 18'	h 42° 08'	l 38° 30'	h 38° 46'	l 39° 82'	h 39° 52'	l 40° 30'	l 40° 22'	l 40° 72'	<i>M</i> = 40''·72 <i>w</i> = 16·40 $\frac{1}{w}$ = 0·06 <i>C</i> = 61° 52' 40''·74
	l 40° 56'	h 41° 74'	h 39° 84'	l 43° 36'	l 42° 12'	l 41° 38'	h 40° 84'	l 40° 68'	l 39° 58'	l 40° 70'	
	l 42° 14'	l 39° 94'	l 41° 74'	l 41° 80'	l 41° 74'	l 41° 34'	h 41° 54'	l 39° 02'	l 39° 42'	l 40° 76'	
		l 41° 24'		l 42° 60'	l 40° 02'		l 39° 96'				
	41° 01'	41° 03'	41° 22'	41° 52'	40° 59'	40° 85'	40° 47'	40° 00'	39° 74'	40° 73'	
At CXXXVIII											
<i>January 1857, observed by Lieutenant J. T. Walker with Troughton and Simms' 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on CXLII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 13'	187° 13'	14° 25'	194° 25'	21° 36'	201° 36'	28° 49'	206° 48'	
CXLII & CXXI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 11''·07 <i>w</i> = 17·50 $\frac{1}{w}$ = 0·06 <i>C</i> = 44° 33' 11''·06
	h 8° 60'	l 12° 22'	l 8° 50'	l 10° 38'	l 11° 86'	l 10° 48'	l 9° 66'	l 10° 10'	l 10° 92'	l 11° 20'	
	l 11° 28'	l 11° 60'	l 12° 00'	l 12° 12'	l 12° 16'	l 12° 48'	l 10° 82'	l 9° 80'	l 10° 94'	l 10° 58'	
	l 11° 62'	l 11° 26'	l 10° 44'	l 13° 08'	l 10° 78'	l 12° 32'	l 10° 52'	l 11° 26'	l 11° 44'	l 11° 72'	
	l 10° 52'		l 11° 06'	l 11° 04'							
	10° 51'	11° 69'	10° 50'	11° 66'	11° 60'	11° 76'	10° 33'	10° 39'	11° 10'	11° 17'	

At CXXXVIII—(Continued.)											
<i>January 1857, observed by Lieutenant J. T. Walker with Troughton and Simms' 24-inch Theodolite No. 2.</i>											
Angle between	Circle readings, telescope being set on CXLII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 0'	7° 13'	187° 13'	14° 25'	194° 25'	21° 36'	201° 36'	28° 49'	208° 48'	
CXLI & CXXXVII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 40" 85 <i>w</i> = 16 36 $\frac{1}{w}$ = 0 06 <i>C</i> = 60° 23' 40" 86
	h 39° 06	l 41° 14	l 42° 18	l 44° 12	h 42° 54	h 40° 26	l 41° 16	l 40° 80	l 41° 18	l 41° 90	
	h 39° 82	l 40° 56	l 40° 64	l 40° 06	h 41° 74	h 40° 22	l 41° 02	l 39° 70	l 41° 32	l 40° 80	
	l 40° 38	l 41° 66	l 40° 24	l 39° 96	h 41° 88	h 41° 36	l 39° 98	l 40° 84	l 40° 16	l 38° 98	
				l 41° 38						l 39° 96	
				l 41° 68							
	39° 75	41° 12	41° 02	41° 44	42° 05	40° 61	40° 72	40° 45	40° 89	40° 41	
CXXXVII & CXXXV	h 9° 34	l 7° 70	l 9° 52	l 6° 98	h 9° 54	h 8° 98	l 7° 54	l 7° 82	l 7° 14	l 6° 94	<i>M</i> = 8" 22 <i>w</i> = 9 28 $\frac{1}{w}$ = 0 11 <i>C</i> = 28° 0' 8" 21
	h 8° 44	l 7° 48	l 9° 26	l 9° 28	h 6° 92	h 9° 66	l 5° 76	l 6° 80	l 6° 52	l 9° 04	
	h 11° 18	l 6° 98	l 10° 94	l 7° 98	h 8° 04	h 7° 82	l 7° 48	l 8° 18	l 8° 54	l 8° 56	
	h 8° 80			l 8° 46	h 8° 50		l 7° 30		l 7° 24	l 8° 56	
							l 6° 84				
	9° 44	7° 39	9° 91	8° 18	8° 25	8° 82	6° 98	7° 60	7° 36	8° 28	
At CXXXIX											
<i>March and April 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 0'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
CXXXVI & CXXXVII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 23° 17 <i>w</i> = 11 02 $\frac{1}{w}$ = 0 09 <i>C</i> = 55° 0' 23" 17
	h 23° 74	l 20° 24	l 25° 14	l 21° 88	l 22° 76	l 23° 34	l 22° 54	l 24° 24	h 23° 24	h 24° 04	
	h 22° 78	l 24° 10	l 24° 26	l 22° 60	l 22° 64	l 24° 16	l 23° 06	l 23° 66	h 23° 70	h 20° 62	
	h 22° 10	l 22° 82	l 24° 04	l 22° 08	l 22° 56	l 24° 70	l 23° 44	l 25° 36	h 23° 70	h 21° 56	
		l 22° 38	l 22° 20					l 25° 10		h 23° 98	
		l 21° 24								h 23° 06	
	22° 87	22° 16	23° 91	22° 19	22° 65	24° 07	23° 01	24° 59	23° 55	22° 65	

At CXXXIX—(Continued.)											
<i>March and April 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 36'	201° 36'	28° 49'	208° 49'	
CXXXVII & CXL	"	"	"	"	"	"	"	"	"	"	M = 4".07 w = 12.30 $\frac{1}{w}$ = 0.08 C = 74° 23' 4".05
	l 4'60	l 5'32	l 2'34	l 3'98	l 3'02	l 4'52	l 3'44	l 2'42	h 5'24	h 2'28	
	l 3'18	l 4'74	l 1'90	l 2'36	l 4'52	l 5'74	l 3'58	l 4'12	h 5'12	h 3'86	
	l 4'66	l 4'80	l 2'98	l 3'96	l 3'68	l 5'26	l 4'14	l 4'50	h 5'42	h 3'82	
			l 5'90					l 3'90		h 2'84	
			l 4'34							h 1'60	
										h 3'92	
	4'15	4'95	3'49	3'43	3'74	5'17	3'72	3'74	5'26	3'05	
At CXL											
<i>March 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 0'	7° 12'	187° 11'	14° 25'	194° 24'	21° 37'	201° 37'	28° 48'	208° 48'	
CXXXIX & CXXXVII	"	"	"	"	"	"	"	"	"	"	M = 9".81 w = 10.72 $\frac{1}{w}$ = 0.09 C = 48° 33' 9".83
	l 8'70	l 9'94	h 10'60	l 8'80	l 8'92	l 9'68	l 9'12	l 10'40	l 11'12	h 10'86	
	l 10'24	l 8'06	h 9'28	l 9'32	l 10'26	l 9'82	l 7'76	l 8'58	l 9'76	h 11'00	
	l 7'12	l 9'92	h 9'16	l 8'80	l 9'64	l 10'82	h 9'00	l 10'20	l 10'88	h 13'24	
	l 7'66	l 10'06					h 10'42	l 11'42	l 8'88	h 13'56	
	l 8'96						h 11'88		l 9'34	l 12'02	
l 9'44						h 9'64		l 8'66	l 11'00		
						l 10'72			l 12'08		
									h 10'96		
	8'69	9'50	9'68	8'97	9'61	10'11	9'79	10'15	9'77	11'84	
CXXXVII & CXLI	l 4'22	l 4'22	l 4'46	l 4'02	l 5'50	l 3'70	l 3'30	l 2'88	l 6'10	l 4'62	M = 4".57 w = 16.02 $\frac{1}{w}$ = 0.06 C = 80° 33' 4".60
	l 3'92	l 7'56	l 3'90	l 4'04	l 4'70	l 4'14	l 4'10	l 5'76	l 6'28	l 3'66	
	l 4'66	l 6'70	l 3'98	l 3'94	l 4'20	l 4'34	l 5'10	l 4'86	l 4'60	l 4'80	
		l 3'60						l 5'88	l 7'00	l 3'94	
			l 5'36								
			h 3'34								
	4'27	5'13	4'11	4'00	4'80	4'06	4'17	4'85	6'00	4'26	

At CXL—(Continued.)											
<i>April 1857, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXXXIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 0'	7° 12'	187° 11'	14° 25'	194° 24'	21° 37'	201° 37'	28° 48'	208° 48'	
CXLI & CXLIV	"	"	"	"	"	"	"	"	"	"	M = 59''·60 w = 18 '90 $\frac{1}{w}$ = 0 '05 C = 60° 53' 59''·60
	h 58° 90	l 60° 70	l 60° 88	l 60° 04	l 59° 96	l 59° 82	l 58° 84	l 59° 26	l 58° 08	l 59° 26	
	h 59° 20	l 59° 72	l 60° 16	l 59° 74	l 59° 72	l 60° 12	l 59° 58	l 59° 60	l 58° 10	l 58° 56	
	h 60° 64	l 60° 34	l 59° 56	l 59° 56	l 60° 56	l 59° 92	l 59° 42	l 60° 08	l 57° 56	h 60° 06	
	59° 58	60° 25	60° 20	59° 78	60° 08	59° 95	59° 28	59° 65	57° 91	59° 29	
At CXLII											
<i>March 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXLII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 18'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	208° 49'	
CXLII & CXLIII	"	"	"	"	"	"	"	"	"	"	M = 22''·21 w = 15 '75 $\frac{1}{w}$ = 0 '06 C = 46° 43' 22''·21
	h 22° 14	l 21° 18	h 24° 66	h 21° 92	l 23° 36	l 22° 88	h 22° 22	h 22° 24	l 20° 90	l 22° 30	
	h 20° 72	l 21° 18	h 21° 86	h 23° 38	l 22° 64	l 22° 56	h 22° 76	h 21° 20	l 22° 84	l 22° 16	
	l 20° 72	l 20° 64	h 22° 98	h 22° 60	l 22° 24	l 22° 38	h 22° 48	h 21° 64	l 21° 88	l 22° 60	
	l 21° 74		h 24° 06						l 21° 60		
	21° 33	21° 00	23° 39	22° 63	22° 75	22° 61	22° 49	21° 69	21° 81	22° 35	
CXLIII & CXLIV	l 26° 16	l 27° 26	h 22° 98	d 25° 58	l 25° 42	l 23° 28	h 27° 48	h 23° 66	l 25° 20	l 25° 86	M = 25''·14 w = 11 '59 $\frac{1}{w}$ = 0 '09 C = 44° 48' 25''·14
	l 24° 26	l 25° 34	h 23° 78	l 24° 80	l 26° 62	l 24° 18	h 25° 20	h 23° 88	l 25° 22	l 25° 64	
	l 25° 80	l 26° 76	h 24° 48	l 25° 48	l 25° 10	l 24° 82	h 25° 50	h 24° 56	l 25° 78	l 25° 34	
		l 26° 32	l 22° 26	l 24° 54			h 24° 80	l 25° 18			
		l 26° 34	l 24° 68				h 24° 90				
							h 26° 28				
	25° 41	26° 40	23° 64	25° 10	25° 71	24° 09	25° 69	24° 32	25° 40	25° 61	

At CXLI—(Continued.)

March 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CXLII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 36'	28° 49'	208° 49'	
CXLI & CXL	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 46''·09 <i>w</i> = 8·70 $\frac{1}{w}$ = 0·11 <i>C</i> = 82° 34' 46''·08
	d46°23 d46°55 l45°40 l46°10	l43°48 l46°52 l44°64 l44°96 l44°58	h46°54 h45°24 h46°16	d45°82 l45°72 l44°90 l44°92	l45°20 l44°56 l45°86	l47°52 l46°22 l47°06	h44°46 h45°32 h45°52 h45°44	h48°30 h48°82	l46°96 l46°16 l46°22	l46°46 l46°84 l46°64	
	46°07	44°84	45°98	45°34	45°21	46°93	45°19	48°23	46°45	46°65	
CXL & CXXXVII	h46°54 h46°62 l47°10 l46°98	l46°82 l46°22 l47°04	h46°58 h45°60 h45°34 h46°22	h46°54 h46°06 h46°18	l46°52 l46°92 l45°82	l46°36 l44°98 d44°64 l46°62	h44°80 h46°40 h45°54	h43°12 h43°82 h44°48 h44°66	l46°10 l46°42 l48°36 l46°22	l45°56 l45°78 l46°12	<i>M</i> = 46''·00 <i>w</i> = 12·75 $\frac{1}{w}$ = 0·08 <i>C</i> = 28° 8' 46''·00
		46°81	46°69	45°94	46°26	46°42	45°65	45°58	44°02	46°78	
CXXXVII & CXXXVIII	l59°82 l60°04 l61°88 l61°38	l61°64 l61°50 l60°76	h60°40 h59°46 h59°66	h62°44 h61°28 h61°34	l61°24 l61°36 l60°86	l62°14 l63°36 d60°69 l60°62	h61°94 h60°58 h60°92	l62°48 l62°32 l62°78	l60°50 l59°62 l57°90 l60°46	l61°84 l61°22 l60°96	<i>M</i> = 61''·11 <i>w</i> = 11·05 $\frac{1}{w}$ = 0·09 <i>C</i> = 62° 29' 61''·10
		60°78	61°30	59°84	61°69	61°15	61°70	61°15	62°53	59°62	
CXXXVIII & CXLI	l40°76 l40°18 l39°16	l41°06 l40°74 l39°96	h40°50 h39°20 h41°02 h38°98	h40°00 h39°22 d39°19	l39°14 l38°64 l39°18	l37°54 l39°30 l40°14 l38°76	h37°96 h39°04 h39°66	l38°80 l38°72 l38°64	l39°42 l39°44 l39°68 l39°64	l37°82 l38°96 l38°74 l37°74	<i>M</i> = 39''·34 <i>w</i> = 17·02 $\frac{1}{w}$ = 0·06 <i>C</i> = 95° 14' 39''·34
		40°03	40°59	39°93	39°47	38°99	38°94	38°89	38°72	39°55	

At CXLII											
January 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 24-inch Theodolite No. 2.											
Angle between	Circle readings, telescope being set on CXLIII										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	272° 8'	92° 8'	279° 20'	99° 20'	286° 32'	106° 32'	293° 44'	118° 44'	300° 58'	120° 58'	
CXLIII & CXLI	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 39" 83 <i>w</i> = 15 49 $\frac{1}{w}$ = 0 06 <i>C</i> = 87° 52' 39" 83
	l 38° 62	l 39° 66	l 38° 54	l 41° 36	l 40° 10	l 40° 10	l 39° 68	l 39° 04	l 37° 66	l 40° 76	
	l 39° 80	l 40° 02	l 40° 44	l 41° 66	l 39° 94	l 38° 26	l 39° 20	l 38° 84	l 39° 48	l 41° 16	
	l 40° 84	l 41° 40	l 38° 58	l 39° 70	l 37° 78	l 39° 92	l 41° 54	l 40° 70	l 39° 00	l 40° 50	
	l 40° 14	l 40° 22	l 39° 22	l 39° 76	l 39° 52		l 39° 86	l 40° 56	l 38° 70	l 41° 44	
	39° 85	40° 33	39° 20	40° 62	39° 34	39° 43	40° 07	39° 79	38° 71	40° 97	
CXLI & CXXXVIII	h 13° 40	l 14° 88	l 14° 92	l 13° 92	l 15° 22	h 14° 36	l 16° 62	l 16° 10	l 17° 90	l 14° 90	<i>M</i> = 15" 66 <i>w</i> = 13 56 $\frac{1}{w}$ = 0 07 <i>C</i> = 40° 12' 15" 66
	l 17° 44	l 15° 48	l 14° 64	l 15° 44	l 15° 16	h 15° 80	l 16° 60	l 17° 88	l 15° 82	l 14° 62	
	l 16° 80	l 16° 26	l 12° 94	l 16° 52	l 17° 14	h 14° 64	l 16° 36	l 15° 02	l 15° 82	l 15° 00	
	l 16° 74	l 14° 84	l 14° 76	l 15° 26	l 17° 56			l 17° 22	l 15° 18	h 15° 68	
	l 15° 88							l 15° 26		h 16° 50	
	16° 05	15° 37	14° 32	15° 29	16° 27	14° 93	16° 53	16° 30	16° 18	15° 34	
At CXLIII											
March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on CXLVI										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 1'	180° 1'	7° 13'	187° 13'	14° 25'	194° 25'	21° 36'	201° 36'	28° 48'	208° 48'	
CXLVI & CXLV	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 15" 96
	l 16° 16	l 13° 06	l 14° 96	l 17° 38	l 15° 42	l 14° 92	l 17° 66	l 16° 94	l 15° 42	l 17° 60	
	l 14° 16	l 13° 30	l 15° 94	l 17° 62	l 15° 28	l 16° 30	l 15° 90	l 18° 24	l 16° 18	l 16° 68	
	15° 16	13° 18	15° 45	17° 50	15° 35	15° 61	16° 78	17° 59	15° 80	17° 14	

## At CXLIII—(Continued.)

\*March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.

†November 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

‡February 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 24-inch Theodolite No. 2.

Angle between	Circle readings, telescope being set on CXLVI										M = Mean of Groups w = Relative Weight C = Concluded Angle
	248° 2'	68° 2'	255° 14'	75° 14'	262° 27'	82° 27'	269° 38'	89° 38'	276° 50'	96° 50'	
† CXLVI & CXLV	"	"	"	"	"	"	"	"	"	"	w = 18.24 $\frac{1}{w}$ = 0.05 C = 50° 18' 16".59
	h 14.38	h 16.42	l 18.46	l 17.38	l 17.04	l 18.08	l 17.76	l 16.82	l 18.72	l 16.72	
	h 15.56	h 16.94	l 17.08	l 17.52	l 17.72	l 17.74	l 15.68	l 16.12	l 16.54	l 16.74	
						l 17.62		l 15.92	l 16.12		
	14.91	16.53	17.73	17.17	17.38	17.50	17.22	16.52	16.83	16.65	M = 16".84
Lesser Circle-reading	50° 20'	280° 20'	57° 32'	237° 31'	64° 43'	244° 43'	71° 55'	251° 54'	79° 8'	259° 8'	
* CXLV & CXLIV	l 28.58	l 30.02	l 30.58	l 29.22	l 27.62	l 31.92	l 26.08	l 27.42	l 27.38	l 28.02	M = 28".71
	l 29.28	l 30.44	l 29.54	l 28.70	l 27.90	l 31.34	l 27.06	l 27.44	l 28.56	l 27.16	
	28.93	30.23	30.06	28.96	27.76	31.63	26.57	27.43	27.97	27.59	
Lesser Circle-reading	298° 20'	118° 20'	306° 32'	125° 32'	812° 45'	132° 45'	819° 56'	189° 56'	327° 8'	147° 8'	
† CXLV & CXLIV	h 29.00	h 28.36	l 26.82	l 27.68	l 27.70	l 25.82	l 26.88	l 26.44	l 26.12	l 25.90	w = 20.48 $\frac{1}{w}$ = 0.05 C = 61° 40' 27".54
	h 28.72	h 28.24	l 27.36	l 27.84	l 26.82	l 27.08	l 26.00	l 27.20	l 27.32	l 26.66	
	h 27.92	h 27.44	l 26.86	l 28.58	l 26.86	l 26.02	l 27.32	l 26.76	l 26.84	l 28.70	
									l 27.82		
	28.55	28.01	27.01	28.03	27.13	26.31	26.73	26.80	26.76	27.27	M = 27".26
	Circle readings, telescope being set on CXLIV										
	0° 0'	180° 0'	7° 12'	187° 12'	14° 25'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
‡ CXLIV & CXLI	"	"	"	"	"	"	"	"	"	"	M = 59".71 w = 24.04 $\frac{1}{w}$ = 0.04 C = 64° 32' 59".71
	l 59.30	l 58.52	l 59.48	l 60.88	l 59.52	l 60.24	l 60.26	h 59.18	l 60.82	l 59.36	
	l 59.36	l 58.74	l 59.76	l 59.74	l 59.20	l 59.34	l 59.86	h 59.46	l 60.10	l 59.02	
	l 58.96	l 58.30	l 59.88	l 60.68	l 59.74	l 61.14	l 59.46	h 60.14	l 59.86	l 59.84	
					l 61.20		l 59.94				
	59.21	58.52	59.71	60.43	59.49	60.48	59.86	59.68	60.26	59.41	

At CXLIII—(Continued.)

February 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 24-inch Theodolite No. 2.

Angle between	Circle readings, telescope being set on CXLIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0'	180° 0'	7° 12'	187° 12'	14° 25'	194° 24'	21° 36'	201° 36'	28° 48'	208° 48'	
CXLII & CXLIII	"	"	"	"	"	"	"	"	"	"	M = 3''·45 w = 14·96 $\frac{1}{w}$ = 0·07 C = 45° 24' 3''·45
	l 3'·28	l 4'·10	l 3'·42	l 2'·18	l 4'·62	l 3'·38	l 3'·82	h 1'·38	l 2'·70	l 2'·48	
	l 3'·74	l 2'·90	l 4'·54	l 3'·68	l 5'·16	l 4'·62	l 3'·80	h 2'·58	l 4'·20	l 4'·30	
	l 3'·88	l 2'·72	l 3'·70	l 2'·28	l 5'·54	l 1'·34	l 3'·98	h 2'·60	l 3'·32	l 3'·38	
				l 4'·42	l 3'·04		h 1'·16				
				l 4'·40	l 4'·36		h 1'·96				
				l 5'·24			l 3'·18				
	3'·63	3'·24	3'·89	2'·71	4'·90	3'·35	3'·87	2'·14	3'·41	3'·39	

At CXLIV

February 1857, observed by Lieutenants J. T. Walker and J. P. Basevi with Troughton and Simms' 24-inch Theodolite No. 2.

Angle between	Circle readings, telescope being set on CXL										M = Mean of Groups w = Relative Weight C = Concluded Angle
	252° 50'	72° 50'	260° 2'	80° 2'	267° 14'	87° 14'	274° 26'	94° 26'	281° 38'	101° 38'	
CXL & CXLII	"	"	"	"	"	"	"	"	"	"	M = 21''·76 w = 13·50 $\frac{1}{w}$ = 0·07 C = 36° 31' 21''·74
	h 23'·20	l 21'·44	l 23'·38	l 22'·06	h 18'·46	l 20'·36	l 21'·86	l 22'·50	l 22'·46	l 20'·82	
	l 21'·62	l 21'·36	l 22'·94	l 21'·50	l 21'·52	l 21'·78	l 21'·94	l 22'·60	l 22'·02	l 20'·26	
	l 21'·50	l 21'·44	l 23'·48	l 21'·84	l 22'·08	l 21'·70	l 21'·88	l 22'·28	l 21'·28	l 20'·88	
				l 21'·76						h 19'·94	
										h 19'·80	
										h 21'·28	
	22'·11	21'·41	23'·27	21'·80	20'·96	21'·28	21'·89	22'·46	21'·92	20'·50	

CXLII & CXLIII	h 42'·24	l 43'·06	l 43'·10	l 40'·70	h 42'·68	l 43'·84	l 41'·34	l 41'·20	l 40'·14	l 42'·90	M = 42''·12 w = 12·07 $\frac{1}{w}$ = 0·08 C = 70° 38' 42''·13
	l 41'·78	l 42'·82	l 43'·66	l 41'·50	h 44'·12	l 42'·28	l 42'·06	l 41'·74	l 40'·84	l 42'·54	
	l 42'·94	l 42'·12	l 42'·84	l 41'·42	l 42'·52	l 41'·26	l 41'·84	l 41'·70	l 40'·60	l 41'·40	
					l 42'·44	l 41'·56				h 43'·92	
										h 42'·66	
										h 43'·28	
	42'·32	42'·67	43'·20	41'·21	42'·94	42'·24	41'·75	41'·55	40'·53	42'·78	



At CXLIV—(Continued.)

\*March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.

†November 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CXLIII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0°0'	180°0'	7°13'	187°13'	14°25'	194°25'	21°37'	201°37'	28°48'	208°48'	
* CXLIII & CXLV	"	"	"	"	"	"	"	"	"	"	
	<i>h</i> 13'96	<i>h</i> 11'98	<i>h</i> 13'66	<i>l</i> 13'80	<i>h</i> 12'36	<i>h</i> 12'80	<i>h</i> 14'92	<i>h</i> 14'76	<i>h</i> 15'06	<i>h</i> 15'54	
	<i>h</i> 13'64	<i>h</i> 11'56	<i>h</i> 13'38	<i>h</i> 12'08	<i>h</i> 13'82	<i>h</i> 13'52	<i>h</i> 13'80	<i>h</i> 11'82	<i>h</i> 15'00	<i>h</i> 13'48	
								<i>h</i> 13'38			
	13'80	11'77	13'52	12'94	13'09	13'16	14'36	13'32	15'03	14'51	M = 13''55
Lesser Circle-reading	274°41'	94°41'	281°53'	101°53'	289°5'	109°5'	296°17'	116°17'	303°29'	123°29'	
† CXLIII & CXLV	<i>h</i> 16'32	<i>h</i> 17'22	<i>h</i> 15'42	<i>l</i> 12'88	<i>l</i> 14'72	<i>l</i> 13'70	<i>l</i> 14'28	<i>l</i> 14'38	<i>l</i> 12'90	<i>l</i> 14'36	<i>w</i> = 22.63
	<i>h</i> 16'94	<i>h</i> 17'32	<i>l</i> 15'24	<i>l</i> 12'36	<i>l</i> 14'96	<i>l</i> 14'08	<i>l</i> 14'92	<i>l</i> 14'36	<i>l</i> 14'18	<i>l</i> 14'88	$\frac{1}{w}$ = 0.04
	<i>h</i> 16'76	<i>h</i> 16'74	<i>l</i> 14'28	<i>l</i> 14'14	<i>l</i> 15'56	<i>l</i> 14'60	<i>l</i> 14'78	<i>l</i> 15'02	<i>l</i> 15'00	<i>l</i> 14'26	<i>C</i> = 49°21'14''29
	<i>l</i> 15'90	<i>l</i> 13'62		<i>l</i> 14'90					<i>l</i> 14'58		
	<i>l</i> 16'48	<i>l</i> 14'18		<i>l</i> 14'32							
	<i>l</i> 15'22	<i>l</i> 14'22									
	16'27	15'55	14'98	13'72	15'08	14'13	14'66	14'59	14'17	14'50	M = 14''77
Lesser Circle-reading	49°21'	229°21'	56°34'	236°34'	63°46'	243°46'	70°59'	250°59'	78°9'	258°9'	
* CXLV & CXLVII	<i>h</i> 55'78	<i>h</i> 56'50	<i>h</i> 55'82	<i>l</i> 55'80	<i>h</i> 55'86	<i>h</i> 57'36	<i>h</i> 56'68	<i>h</i> 56'84	<i>h</i> 54'70	<i>h</i> 56'90	
	<i>h</i> 55'76	<i>h</i> 55'08	<i>h</i> 54'48	<i>h</i> 55'46	<i>h</i> 56'16	<i>h</i> 57'96	<i>h</i> 57'28	<i>h</i> 58'72	<i>h</i> 56'32	<i>h</i> 56'98	
			<i>h</i> 55'42								
	55'77	55'79	55'24	55'63	56'01	57'66	56'98	57'78	55'51	56'94	M = 56''33
Lesser Circle-reading	324°2'	144°2'	331°14'	151°14'	338°26'	158°26'	345°38'	165°38'	352°50'	172°50'	
† CXLV & CXLVII	<i>h</i> 56'00	<i>h</i> 54'46	<i>l</i> 56'04	<i>l</i> 57'12	<i>l</i> 56'40	<i>l</i> 56'34	<i>l</i> 55'48	<i>l</i> 56'90	<i>l</i> 55'66	<i>l</i> 55'76	<i>w</i> = 28.13
	<i>h</i> 55'78	<i>h</i> 54'18	<i>l</i> 55'60	<i>l</i> 56'76	<i>l</i> 55'34	<i>l</i> 56'70	<i>l</i> 55'46	<i>l</i> 56'58	<i>l</i> 54'12	<i>l</i> 56'02	$\frac{1}{w}$ = 0.04
	<i>h</i> 54'90	<i>h</i> 56'42	<i>l</i> 56'16	<i>l</i> 56'54	<i>l</i> 56'02	<i>l</i> 54'90	<i>l</i> 55'78	<i>l</i> 56'56	<i>l</i> 54'00	<i>l</i> 56'34	<i>C</i> = 35°58'55''94
	<i>h</i> 54'84	<i>h</i> 55'50							<i>l</i> 54'30		
	55'38	55'14	55'93	56'81	55'92	55'98	55'57	56'68	54'52	56'04	M = 55''80

At CXLV											
*March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1. †November 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
* CXLVIII & CXLVII	"	"	"	"	"	"	"	"	"	"	M = 22''·29
	h 22° 90	h 20° 96	l 23° 48	l 23° 72	l 21° 28	l 25° 30	l 20° 94	h 20° 00	h 20° 84	h 24° 10	
	h 23° 26	h 20° 94	l 22° 84	l 22° 72	l 21° 28	l 23° 40	l 19° 72	h 21° 80	h 22° 10	h 24° 28	
	23° 08	20° 95	23° 16	23° 22	21° 28	24° 35	20° 33	20° 90	21° 47	24° 19	
Lesser Circle-reading	215° 32'	35° 32'	222° 43'	42° 43'	229° 56'	49° 56'	237° 8'	57° 8'	241° 20'	61° 20'	
+ CXLVIII & CXLVII	h 23° 56	h 21° 72	l 22° 42	l 23° 04	h 21° 20	h 23° 70	l 22° 48	l 24° 52	d 22° 32	h 24° 54	w = 14·88 $\frac{l}{w} = 0\cdot07$ C = 87° 47' 22''·86
	h 23° 76	l 23° 12	l 22° 40	l 23° 12	h 24° 36	h 23° 02	l 20° 82	l 23° 12	d 24° 20	h 24° 30	
	h 24° 44	l 22° 00	l 18° 56	l 23° 94	h 21° 68	h 24° 86	l 20° 96	l 23° 44	d 22° 90	h 23° 98	
			l 21° 24	l 23° 96	h 21° 28		h 23° 18		d 24° 02		
			l 22° 74		h 22° 42		h 22° 58		d 22° 96		
			h 22° 72				h 23° 86				
			h 24° 24								
			h 22° 34								
	23° 92	22° 28	22° 08	23° 52	22° 19	23° 86	22° 31	23° 69	23° 28	24° 27	M = 23''·14
Lesser Circle-reading	87° 49'	267° 49'	95° 0'	275° 0'	102° 13'	282° 13'	109° 24'	289° 24'	116° 36'	296° 36'	
* CXLVII & CXLIV	h 39° 56	h 41° 12	l 39° 44	l 41° 14	l 41° 60	l 40° 98	l 40° 30	h 41° 88	h 41° 12	h 40° 26	M = 40''·88
	h 39° 86	l 41° 82	l 40° 32	l 42° 30	l 42° 58	l 42° 80	l 39° 60	h 40° 86	h 41° 32	h 38° 80	
	39° 71	41° 47	39° 88	41° 72	42° 09	41° 89	39° 95	41° 37	41° 22	39° 53	
Lesser Circle-reading	303° 19'	123° 19'	310° 31'	130° 31'	317° 43'	137° 43'	324° 55'	144° 55'	332° 7'	152° 7'	
+ CXLVII & CXLIV	h 39° 72	h 43° 00	l 40° 20	l 44° 16	h 42° 50	h 41° 40	l 41° 66	l 40° 92	l 40° 02	h 41° 00	w = 23·73 $\frac{l}{w} = 0\cdot04$ C = 76° 41' 41''·11
	h 40° 60	l 41° 98	l 42° 20	l 41° 02	h 39° 68	h 41° 52	l 41° 90	l 40° 92	l 40° 76	h 40° 74	
	h 40° 80	l 41° 52	l 43° 96	l 41° 54	h 40° 38	h 40° 44	l 41° 44	l 42° 14	l 41° 36	h 40° 70	
			l 42° 42	l 42° 60	h 41° 12						
			l 41° 18	l 43° 06	h 41° 26						
	40° 37	42° 17	41° 99	42° 48	40° 99	41° 12	41° 67	41° 33	40° 71	40° 81	M = 41''·36

At CXLV—(Continued.)

\*March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.

†November 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CXLIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	164° 31'	344° 31'	171° 42'	351° 42'	178° 54'	358° 54'	186° 6'	6° 6'	193° 18'	13° 18'	
* CXLIV & CXLIII	"	"	"	"	"	"	"	"	"	"	
	<i>h</i> 22° 40'	<i>h</i> 22° 68'	<i>l</i> 26° 20'	<i>l</i> 23° 84'	<i>l</i> 24° 30'	<i>l</i> 23° 08'	<i>l</i> 24° 58'	<i>h</i> 21° 94'	<i>h</i> 23° 04'	<i>h</i> 21° 62'	
	<i>h</i> 22° 76'	<i>l</i> 22° 52'	<i>l</i> 25° 24'	<i>l</i> 22° 22'	<i>l</i> 22° 66'	<i>l</i> 23° 32'	<i>l</i> 25° 74'	<i>h</i> 21° 64'	<i>h</i> 22° 16'	<i>h</i> 21° 50'	
	22° 58'	22° 60'	25° 72'	23° 03'	23° 48'	23° 20'	25° 16'	21° 79'	22° 60'	21° 56'	M = 23° 17'
Lesser Circle-reading	20° 1'	200° 1'	27° 13'	207° 12'	34° 25'	214° 25'	41° 37'	221° 37'	48° 49'	228° 49'	
+ CXLIV & CXLIII	<i>h</i> 22° 50'	<i>h</i> 21° 02'	<i>l</i> 21° 02'	<i>l</i> 22° 34'	<i>h</i> 20° 58'	<i>h</i> 23° 46'	<i>l</i> 23° 54'	<i>l</i> 25° 14'	<i>l</i> 23° 98'	<i>l</i> 22° 58'	<i>w</i> = 13 '32
	<i>h</i> 23° 34'	<i>h</i> 21° 88'	<i>l</i> 22° 36'	<i>l</i> 21° 26'	<i>h</i> 22° 32'	<i>h</i> 22° 32'	<i>l</i> 24° 76'	<i>l</i> 24° 74'	<i>l</i> 23° 60'	<i>d</i> 23° 19'	$\frac{1}{w}$ = 0 '08
	<i>h</i> 21° 88'	<i>l</i> 20° 82'	<i>l</i> 23° 08'	<i>l</i> 21° 34'	<i>h</i> 23° 00'	<i>h</i> 22° 66'	<i>l</i> 24° 34'	<i>l</i> 24° 94'	<i>l</i> 22° 86'	<i>h</i> 22° 24'	<i>C</i> = 68° 58' 23" 00
	22° 57'	21° 24'	22° 48'	21° 93'	22° 41'	22° 81'	24° 21'	24° 87'	23° 48'	22° 79'	M = 22° 88'
Lesser Circle-reading	233° 29'	53° 29'	240° 40'	60° 40'	247° 53'	67° 53'	255° 4'	75° 4'	262° 16'	82° 16'	
* CXLIII & CXLVI	<i>h</i> 10° 46'	<i>h</i> 9° 56'	<i>l</i> 10° 06'	<i>l</i> 9° 54'	<i>l</i> 9° 44'	<i>l</i> 8° 32'	<i>l</i> 13° 04'	<i>h</i> 9° 58'	<i>h</i> 13° 56'	<i>h</i> 13° 74'	
	<i>h</i> 10° 04'	<i>l</i> 9° 76'	<i>l</i> 11° 78'	<i>l</i> 9° 52'	<i>l</i> 10° 28'	<i>l</i> 9° 04'	<i>l</i> 11° 90'	<i>h</i> 11° 22'	<i>h</i> 14° 16'	<i>h</i> 13° 10'	
	10° 25'	9° 66'	10° 92'	9° 53'	9° 86'	8° 68'	12° 47'	10° 40'	13° 86'	13° 42'	M = 10° 91'
Lesser Circle-reading	88° 59'	268° 59'	96° 11'	276° 11'	103° 24'	283° 24'	110° 35'	290° 35'	117° 48'	297° 48'	
+ CXLIII & CXLVI	<i>h</i> 11° 68'	<i>h</i> 10° 68'	<i>l</i> 10° 00'	<i>l</i> 10° 42'	<i>h</i> 11° 16'	<i>h</i> 10° 06'	<i>l</i> 7° 44'	<i>l</i> 10° 22'	<i>l</i> 10° 26'	<i>l</i> 7° 98'	<i>w</i> = 24 '58
	<i>h</i> 9° 60'	<i>h</i> 10° 50'	<i>l</i> 8° 78'	<i>l</i> 8° 18'	<i>h</i> 10° 00'	<i>h</i> 10° 12'	<i>l</i> 9° 26'	<i>l</i> 9° 70'	<i>l</i> 9° 38'	<i>d</i> 10° 02'	$\frac{1}{w}$ = 0 '04
	<i>h</i> 10° 70'	<i>l</i> 11° 06'	<i>l</i> 9° 28'	<i>l</i> 10° 40'	<i>h</i> 9° 52'	<i>h</i> 10° 18'	<i>l</i> 9° 52'	<i>l</i> 9° 62'	<i>l</i> 8° 30'	<i>h</i> 9° 92'	<i>C</i> = 69° 57' 10" 00
	10° 66'	10° 75'	9° 26'	10° 01'	9° 94'	10° 12'	9° 06'	9° 85'	9° 76'	9° 60'	M = 9° 90'
Lesser Circle-reading	88° 59'	268° 59'	96° 11'	276° 11'	103° 24'	283° 24'	110° 35'	290° 35'	117° 48'	297° 48'	
	<i>l</i> 8° 96'	<i>l</i> 11° 04'	<i>h</i> 9° 06'		<i>l</i> 10° 00'			<i>h</i> 11° 08'	<i>h</i> 10° 80'	<i>h</i> 9° 26'	

At CXLV—(Continued.)											
*March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.											
†November 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	803° 26'	123° 26'	310° 38'	130° 37'	317° 50'	137° 50'	325° 2'	145° 1'	332° 14'	152° 13'	
* CXLVI & CXLVIII	<i>h</i> 24' 28	<i>h</i> 26' 30	<i>l</i> 20' 64	<i>l</i> 22' 26	<i>l</i> 22' 80	<i>l</i> 22' 50	<i>l</i> 22' 28	<i>h</i> 23' 92	<i>h</i> 20' 32	<i>h</i> 21' 04	<i>M</i> = 22" 78
	<i>h</i> 24' 10	<i>l</i> 26' 40	<i>l</i> 21' 02	<i>l</i> 24' 34	<i>l</i> 24' 16	<i>l</i> 21' 28	<i>l</i> 23' 28	<i>h</i> 22' 14	<i>h</i> 19' 78	<i>h</i> 22' 74	
Lesser Circle-reading	24' 19	26' 35	20' 83	23' 30	23' 48	21' 89	22' 78	23' 03	20' 05	21' 89	
Lesser Circle-reading	158° 56'	338° 56'	166° 8'	346° 8'	173° 21'	353° 21'	180° 33'	0° 33'	187° 45'	7° 45'	
† CXLVI & CXLVIII	<i>h</i> 22' 98	<i>h</i> 23' 60	<i>l</i> 24' 74	<i>l</i> 21' 54	<i>h</i> 21' 64	<i>h</i> 21' 08	<i>l</i> 23' 20	<i>l</i> 21' 24	<i>h</i> 22' 42	<i>h</i> 21' 94	<i>w</i> = 13 08 $\frac{1}{w}$ = 0 c8 <i>C</i> = 56° 35' 22" 73
	<i>h</i> 22' 32	<i>l</i> 23' 40	<i>l</i> 25' 38	<i>l</i> 23' 30	<i>h</i> 24' 48	<i>h</i> 22' 64	<i>l</i> 23' 08	<i>d</i> 21' 75	<i>h</i> 23' 80	<i>h</i> 22' 06	
	<i>h</i> 22' 66	<i>l</i> 22' 82	<i>l</i> 25' 04	<i>l</i> 20' 90	<i>h</i> 23' 72	<i>h</i> 21' 74	<i>l</i> 23' 70	<i>d</i> 20' 27	<i>h</i> 22' 34	<i>h</i> 23' 32	
			<i>l</i> 23' 24	<i>l</i> 21' 04	<i>h</i> 24' 00				<i>h</i> 24' 62	<i>h</i> 22' 94	
			<i>h</i> 22' 58							<i>h</i> 22' 46	
			<i>h</i> 22' 84								
			<i>h</i> 22' 80								
	22' 65	23' 27	23' 80	21' 70	23' 46	21' 82	23' 33	21' 09	23' 30	22' 54	<i>M</i> = 22" 70

At CXLVI											
March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.											
Angle between	Circle readings, telescope being set on (XVII)										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
(XVII) & CXLVIII	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 39" 41
	<i>h</i> 39' 32	<i>l</i> 37' 82	<i>l</i> 39' 00	<i>l</i> 38' 82	<i>l</i> 39' 78	<i>l</i> 39' 26	<i>l</i> 37' 94	<i>l</i> 40' 84	<i>l</i> 39' 28	<i>l</i> 39' 58	
	<i>l</i> 40' 00	<i>l</i> 37' 34	<i>l</i> 39' 82	<i>l</i> 39' 76	<i>l</i> 40' 40	<i>l</i> 39' 62	<i>l</i> 39' 80	<i>l</i> 40' 60	<i>l</i> 39' 34	<i>l</i> 39' 86	
	39' 66	37' 58	39' 41	39' 29	40' 09	39' 44	38' 87	40' 72	39' 31	39' 72	

NOTE.—(XVII) appertains to base-line figures.

At CXLVI—(Continued.)											
*March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.											
†October 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	179° 19'	359° 19'	186° 31'	6° 31'	198° 43'	18° 43'	200° 55'	20° 55'	206° 7'	28° 7'	
+ (XVII) & CXLVIII	"	"	"	"	"	"	"	"	"	"	w = 35 '11 I = 0 '03 w C = 73° 7' 39" .08 M = 38" .88
	l 39° 00	l 39° 10	l 37° 86	l 39° 86	h 37° 36	h 38° 18	h 39° 28	h 38° 44	h 39° 72	l 40° 38	
	l 39° 22	l 39° 46	l 38° 52	l 39° 28	h 38° 92	h 38° 62	h 38° 10	h 39° 42	h 37° 86	l 39° 28	
	l 37° 86	l 39° 90	l 38° 98	l 38° 32	h 39° 92	h 37° 14	h 40° 00	h 39° 28	h 37° 94	l 39° 88	
	38° 69	39° 49	38° 45	39° 15	38° 53	37° 98	39° 13	39° 05	38° 51	39° 85	
Lesser Circle-reading	73° 8'	253° 8'	80° 20'	260° 20'	87° 31'	267° 31'	94° 43'	274° 43'	101° 55'	281° 55'	
* CXLVIII & CXLV	h 27° 66	h 25° 88	l 26° 10	l 25° 68	l 26° 06	l 28° 64	l 25° 20	l 27° 48	h 26° 78	h 29° 28	M = 26" .73
	h 24° 86	h 25° 86	l 25° 08	l 27° 76	l 25° 66	l 27° 58	l 24° 42	l 28° 76	h 27° 68	h 28° 94	
	h 24° 62			l 27° 32							
	25° 71	25° 87	25° 59	26° 92	25° 86	28° 11	24° 81	28° 12	27° 23	29° 11	
Lesser Circle-reading	252° 26'	72° 26'	259° 38'	79° 38'	266° 50'	86° 50'	271° 2'	94° 2'	281° 14'	101° 14'	
+ CXLVIII & CXLV	d 26° 35	d 26° 39	d 27° 35	d 26° 69	d 28° 45	d 27° 98	h 25° 48	h 27° 64	h 27° 48	l 26° 48	w = 20 '93 I = 0 '05 w C = 47° 50' 26" .84 M = 26" .85
	d 26° 07	d 26° 53	d 26° 27	d 25° 83	d 26° 29	d 27° 20	h 28° 22	h 27° 16	h 27° 54	l 25° 20	
	d 24° 95	d 26° 21	d 27° 49	d 26° 87	d 27° 51	d 27° 32	h 27° 32	h 27° 36	h 26° 92	l 25° 66	
				d 27° 79			h 27° 68	h 26° 00			
							l 28° 26				
							h 28° 90				
							h 27° 80				
	25° 79	26° 38	27° 04	26° 46	27° 51	27° 50	27° 67	27° 04	27° 31	25° 78	
Lesser Circle-reading	120° 59'	300° 59'	128° 10'	308° 10'	135° 21'	315° 21'	142° 34'	322° 34'	140° 46'	329° 46'	
* CXLV & CXLIII	h 36° 00	h 35° 88	l 39° 10	l 37° 80	l 36° 00	l 37° 30	l 37° 68	l 38° 16	h 38° 44	h 34° 74	M = 36" .95
	h 37° 52	h 35° 16	l 38° 64	l 35° 66	l 36° 16	l 36° 50	l 36° 88	l 36° 40	h 37° 40	h 36° 58	
	h 37° 66			l 37° 44							
	37° 06	35° 52	38° 87	36° 97	36° 08	36° 90	37° 28	37° 28	37° 92	35° 66	

NOTE.—(XVII) appertains to base-line figures.

At CXLVI—(Continued.)											
<i>October 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	300° 16'	120° 16'	307° 28'	127° 28'	314° 41'	134° 41'	321° 52'	141° 52'	329° 4'	149° 4'	
CXLV & CXLIII	"	"	"	"	"	"	"	"	"	"	w = 16.88 $\frac{1}{w} = 0.06$ C = 59° 44' 36".99
	h37°44'	h36°94'	l38°66'	l38°26'	l37°24'	l36°86'	h36°64'	h35°26'	h37°62'	h36°90'	
	h37°46'	h37°38'	l37°68'	l38°20'	l38°86'	l36°58'	h35°64'	h34°96'	h35°52'	l38°32'	
	h37°60'	h38°14'	l37°06'	l37°30'	l37°66'	l37°58'	h33°70'	h35°58'	h38°78'	l37°14'	
							h34°98'	h37°10'	h36°50'		
							l34°36'	h34°84'	l38°84'		
							h34°28'	h36°16'	l37°50'		
							h36°16'		h35°54'		
									h36°20'		
									h35°78'		
	37°50'	37°49'	37°80'	37°92'	37°92'	37°01'	35°11'	35°65'	36°92'	37°45'	M = 37".08
At CXLVII											
<i>*March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.</i>											
<i>†November 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.</i>											
Angle between	Circle readings, telescope being set on CXLIV										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
CXLIV & CXLV	"	"	"	"	"	"	"	"	"	"	M = 25".25  w = 24.70 $\frac{1}{w} = 0.04$ C = 67° 19' 26".65
	h24°64'	h23°92'	l24°50'	l25°66'	l25°58'	l27°52'	l23°72'	l25°72'	l26°34'	l26°42'	
	h24°70'	h23°06'	l25°10'	l26°92'	l26°46'	l25°42'	l23°12'	l25°88'	l25°10'	l25°12'	
	24°67'	23°49'	24°80'	26°29'	26°02'	26°47'	23°42'	25°80'	25°72'	25°77'	
Lesser Circle-reading	184° 11'	4° 10'	191° 22'	11° 22'	198° 34'	18° 34'	205° 50'	25° 49'	212° 58'	32° 58'	
CXLIV & CXLV	h26°68'	h26°24'	l27°56'	l28°64'	l28°90'	l27°26'	h26°22'	h27°52'	l26°08'	l28°48'	
	h26°90'	h26°82'	l27°82'	l28°08'	l27°84'	l25°74'	h25°78'	h27°80'	l27°82'	l28°18'	
	l27°88'	h27°10'	l27°30'	l25°36'	l28°16'	l27°62'	h26°04'	h28°30'	l25°46'	l25°60'	
				l25°30'		l29°82'	d27°33'		l26°16'	d26°82'	
				l26°18'		l27°94'	d27°29'			d28°26'	
							d27°63'			d27°40'	
	27°15'	26°72'	27°56'	26°71'	28°30'	27°68'	26°72'	27°87'	26°38'	27°46'	M = 27".26

## At CXLVII—(Continued.)

\*March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.

†November 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	67° 21'	247° 21'	74° 32'	254° 32'	81° 44'	261° 44'	88° 56'	268° 56'	96° 8'	276° 8'	
* CXLV & CXLVIII	"	"	"	"	"	"	"	"	"	"	M = 20" 18'
	h 21° 14'	h 19° 48'	l 19° 02'	l 18° 24'	l 19° 34'	l 21° 64'	l 20° 18'	l 21° 52'	l 18° 32'	l 20° 36'	
	h 22° 54'	h 19° 70'	l 19° 20'	l 19° 22'	l 19° 24'	l 22° 46'	l 19° 96'	l 20° 62'	l 21° 04'	l 20° 42'	
	21° 84'	19° 59'	19° 11'	18° 73'	19° 29'	22° 05'	20° 07'	21° 07'	19° 68'	20° 39'	
Lesser Circle-reading	251° 30'	71° 30'	258° 42'	78° 42'	265° 54'	85° 54'	273° 9'	93° 9'	280° 18'	100° 18'	
+ CXLV & CXLVIII	h 18° 76'	h 19° 32'	l 17° 70'	l 15° 80'	l 15° 26'	h 15° 64'	d 20° 71'	d 17° 83'	l 20° 26'	l 19° 14'	w = 12 '74
	h 18° 30'	h 20° 20'	l 17° 16'	l 17° 42'	l 16° 78'	l 17° 62'	d 20° 67'	d 18° 77'	l 19° 64'	l 16° 82'	$\frac{l}{w} = 0 \cdot 08$
	h 17° 04'	h 19° 76'	l 16° 32'	l 18° 16'	l 16° 10'	l 16° 16'	d 21° 01'	d 18° 93'	l 19° 78'	l 19° 84'	C = 43° 43' 19" 34
			l 19° 10'	h 18° 36'	l 18° 22'	h 18° 92'				d 18° 00'	
			l 18° 94'	h 18° 30'	l 15° 34'	h 19° 30'				d 19° 44'	
				h 18° 54'	l 17° 82'	h 19° 96'				d 18° 58'	
	18° 03'	19° 76'	17° 06'	17° 88'	17° 22'	16° 80'	20° 10'	18° 51'	19° 89'	18° 64'	M = 18" 39'
Lesser Circle-reading	111° 4'	291° 4'	118° 15'	298° 15'	125° 27'	305° 27'	132° 40'	312° 40'	139° 51'	319° 52'	
* CXLVIII & CXLIX	h 35° 50'	h 35° 74'	l 35° 84'	l 38° 44'	l 35° 56'	l 34° 82'	l 34° 82'	l 34° 72'	l 36° 32'	l 35° 34'	M = 35" 93'
	h 34° 66'	h 36° 40'	l 36° 32'	l 36° 92'	l 35° 84'	l 35° 12'	l 36° 28'	l 36° 34'	l 36° 70'	l 36° 84'	
	35° 08'	36° 07'	36° 08'	37° 68'	35° 70'	34° 97'	35° 55'	35° 53'	36° 51'	36° 09'	
Lesser Circle-reading	295° 18'	115° 18'	302° 25'	122° 25'	309° 37'	129° 37'	316° 53'	186° 52'	324° 1'	144° 1'	
+ CXLVIII & CXLIX	h 34° 98'	h 36° 28'	l 36° 12'	l 35° 40'	l 35° 34'	l 36° 36'	l 35° 42'	l 35° 38'	l 35° 30'	l 35° 34'	w = 33 '20 $\frac{l}{w} = 0 \cdot 03$ C = 64° 47' 35" 68
	h 36° 70'	h 35° 46'	l 35° 04'	l 35° 90'	l 33° 38'	l 36° 78'	l 36° 08'	l 34° 38'	l 33° 76'	l 36° 36'	
	h 36° 22'	h 36° 78'	l 35° 48'	l 36° 76'	l 34° 64'	l 35° 14'	l 36° 12'	l 35° 14'	l 35° 28'	l 34° 46'	
	35° 97'	36° 17'	35° 55'	36° 02'	34° 45'	36° 09'	35° 87'	34° 97'	34° 78'	35° 39'	M = 35" 53'

At CXLVIII											
*February and March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.											
†October and November 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on (XIX)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 13'	187° 13'	14° 25'	194° 25'	21° 37'	201° 37'	28° 48'	208° 48'	
* (XIX) & CXLIX	"	"	"	"	"	"	"	"	"	"	
	l 28°42	l 28°62	l 27°68	l 26°34	l 28°98	h 30°80	h 27°88	h 27°84	h 28°86	l 28°66	
	l 27°14	h 26°70	l 26°26	l 25°68	l 27°72	h 31°84	h 28°64	h 29°60	h 29°36	l 25°70	
										l 26°12	
	27°78	27°66	26°97	26°01	28°35	31°32	28°26	28°72	29°11	26°83	M = 28"·10
Lesser Circle-reading	48° 57'	228° 57'	56° 8'	236° 8'	63° 21'	243° 21'	70° 32'	250° 33'	77° 45'	257° 45'	
† (XIX) & CXLIX	h 28°38	h 27°70	h 26°38	h 29°18	h 27°38	l 27°80	l 27°36	h 27°48	l 27°32	h 28°58	w = 25 ·18
	h 27°24	l 26°80	h 26°44	l 28°02	h 26°86	l 27°34	h 27°06	h 26°72	l 28°80	l 28°98	$\frac{1}{w} = 0 \cdot 04$
	h 27°98	l 25°68	h 28°90	l 27°52	h 27°44	h 28°12	h 27°90	l 26°12	l 27°12	l 27°88	C = 65° 31' 27"·71
		l 27°34	l 29°58				h 27°44				
			h 28°64								
			h 28°24								
	27°87	26°88	28°03	28°24	27°23	27°75	27°44	26°77	27°75	28°48	M = 27"·64
Lesser Circle-reading	65° 33'	245° 34'	72° 44'	252° 44'	79° 56'	259° 56'	87° 8'	267° 8'	94° 20'	274° 20'	
* CXLIX & CXLVII	l 24°48	h 28°00	l 29°46	l 30°34	l 26°88	h 28°40	h 26°20	h 26°94	h 25°20	l 27°52	
	l 27°94	l 28°44	l 27°20	l 28°84	l 28°62	h 29°64	h 25°70	h 26°24	h 27°18	l 29°26	
	l 27°44	l 27°78								l 28°54	
	26°62	28°07	28°33	29°59	27°75	29°02	25°95	26°59	26°19	28°44	M = 27"·66
Lesser Circle-reading	114° 28'	294° 28'	121° 40'	301° 40'	128° 52'	306° 52'	136° 4'	316° 4'	143° 16'	228° 16'	
† CXLIX & CXLVII	h 27°70	l 28°60	h 27°78	h 27°50	h 28°00	h 25°88	h 31°38	l 28°40	l 29°08	h 27°60	w = 14 ·37
	h 28°46	l 29°46	h 27°82	l 28°68	h 27°02	l 28°66	h 30°78	l 29°04	l 28°60	l 26°88	$\frac{1}{w} = 0 \cdot 07$
	h 27°30	l 28°62	h 26°32	l 27°86	h 28°70	l 27°56	h 30°32	l 28°58	l 31°28	l 28°58	C = 48° 16' 28"·13
						d 28°16	d 29°71		l 29°74		
						d 28°18	h 29°14				
	27°82	28°89	27°31	28°01	27°91	27°69	30°27	28°67	29°68	27°69	M = 28"·39

NOTE.—(XIX) appertains to base-line figures.



At CXLVIII—(Continued.)

\*February and March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch  
Theodolite No. 1.

†October and November 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with  
Troughton and Simms' 36-inch Theodolite.

Angle between	Lesser Circle-reading										$M$ = Mean of Groups $w$ = Relative Weight $C$ = Concluded Angle
	118°50'	293°50'	121°1'	301°1'	128°13'	308°13'	135°25'	315°25'	142°36'	322°36'	
* CXLVII & CXLV	"	"	"	"	"	"	"	"	"	"	
	l 23°26'	l 19°86'	l 19°76'	l 17°44'	l 19°44'	h 18°10'	h 18°34'	h 19°52'	h 21°00'	l 19°92'	
	l 21°32'	l 19°92'	l 21°02'	l 20°78'	l 18°52'	h 17°52'	h 18°50'	h 19°54'	h 19°92'	l 20°82'	
	l 21°70'										
	22°09'	19°89'	20°39'	19°11'	18°98'	17°81'	18°42'	19°53'	20°46'	20°37'	$M = 19''\cdot71$
Lesser Circle-reading	162°45'	342°45'	169°56'	349°56'	177°9'	357°9'	184°20'	4°20'	191°33'	11°33'	
+ CXLVII & CXLV	h 20°00'	l 19°98'	h 20°62'	l 19°16'	h 19°58'	h 20°24'	h 17°94'	l 21°44'	l 18°14'	h 19°58'	$w = 20\cdot62$
	h 18°96'	l 20°18'	h 19°82'	l 19°32'	h 20°24'	l 18°40'	h 18°32'	l 19°14'	l 18°22'	l 20°90'	$\frac{1}{w} = 0\cdot05$
	h 18°62'	l 20°42'	h 19°92'	l 19°96'	h 19°66'	l 18°30'	h 19°20'	l 18°90'	l 17°96'	l 20°44'	$C = 48^\circ 29' 19''\cdot49$
						d 19°77'	d 17°79'	l 18°66'			
						d 19°79'		l 18°32'			
	19°19'	20°19'	20°12'	19°48'	19°83'	19°30'	18°31'	19°29'	18°11'	20°31'	$M = 19''\cdot41$
Lesser Circle-reading	162°19'	342°19'	169°30'	349°30'	176°42'	356°42'	183°54'	8°54'	191°6'	11°6'	
* CXLV & CXLVI	l 13°28'	l 14°50'	l 14°32'	l 14°40'	l 15°08'	h 15°24'	h 13°26'	h 13°74'	h 11°38'	l 12°22'	
	l 12°98'	l 13°48'	l 11°80'	l 12°40'	l 15°28'	h 14°92'	h 15°48'	h 13°60'	l 11°96'	l 11°82'	
	h 13°38'										
	13°21'	13°99'	13°06'	13°40'	15°18'	15°08'	14°37'	13°67'	11°67'	12°02'	$M = 13''\cdot57$
Lesser Circle-reading	211°14'	31°14'	218°26'	38°26'	225°38'	45°38'	232°50'	52°50'	240°2'	60°2'	
+ CXLV & CXLVI	h 13°18'	l 12°20'	h 13°36'	l 12°20'	h 12°80'	l 14°80'	h 13°16'	l 12°24'	l 13°98'	h 12°60'	$w = 23\cdot73$
	h 14°12'	l 12°92'	h 12°46'	l 14°08'	h 13°24'	l 14°18'	h 14°76'	l 13°52'	l 14°88'	l 11°40'	$\frac{1}{w} = 0\cdot04$
	h 13°42'	l 13°78'	h 13°16'	l 13°56'	h 13°74'	l 14°54'	h 13°72'	l 14°08'	l 14°98'	l 13°54'	$C = 75^\circ 34' 13''\cdot50$
										l 12°42'	
	13°57'	12°97'	12°99'	13°28'	13°26'	14°51'	13°88'	13°28'	14°61'	12°49'	$M = 13''\cdot48$

At CXLVIII—(Continued.)											
*February and March 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.											
†October and November 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Lesser Circle-reading										M = Mean of Groups w = Relative Weight C = Concluded Angle
	237° 53'	57° 54'	245° 4'	65° 4'	252° 16'	72° 16'	259° 28'	79° 29'	266° 40'	86° 40'	
* CXLVI & (XVII)	"	"	"	"	"	"	"	"	"	"	
	l 37° 60'	l 35° 94'	l 37° 68'	l 37° 26'	l 38° 00'	h 36° 36'	h 37° 06'	h 39° 98'	h 38° 72'	l 40° 20'	
	l 37° 12'	l 39° 82'	l 39° 36'	l 37° 80'	l 37° 64'	h 37° 70'	h 38° 74'	h 38° 32'	l 39° 96'	l 40° 20'	
	37° 36'	37° 88'	38° 52'	37° 53'	37° 82'	37° 03'	38° 35'	39° 15'	39° 34'	40° 20'	M = 38''·32
Lesser Circle-reading	286° 48'	106° 48'	294° 0'	114° 0'	301° 12'	121° 12'	308° 24'	128° 24'	315° 36'	135° 36'	
† CXLVI & (XVII)	h 37° 06'	l 40° 86'	h 38° 36'	l 38° 66'	d 39° 89'	d 37° 68'	h 37° 22'	h 38° 58'	l 37° 66'	h 39° 60'	w = 17 '94 1/w = 0 '06 C = 73° 12' 38''·47
	h 38° 00'	l 40° 18'	h 40° 14'	l 38° 14'	d 38° 77'	d 38° 74'	h 36° 88'	l 39° 28'	l 37° 02'	h 39° 48'	
	h 37° 34'	l 39° 58'	h 38° 00'	l 39° 98'	d 37° 69'	d 38° 80'	h 37° 96'	l 37° 86'	l 35° 28'	l 38° 94'	
	l 38° 80'		h 39° 76'		h 38° 86'				h 38° 78'	h 38° 44'	
	37° 80'	40° 21'	39° 07'	38° 93'	38° 80'	38° 41'	37° 35'	38° 57'	37° 44'	39° 34'	M = 38''·59
Lesser Circle-reading	811° 6'	131° 6'	318° 17'	138° 17'	325° 29'	145° 29'	332° 41'	152° 41'	339° 53'	159° 53'	
* (XVII) & (XIX)	l 53° 02'	l 55° 92'	l 53° 24'	l 55° 12'	l 52° 08'	h 51° 68'	h 55° 24'	h 51° 56'	h 53° 14'	l 53° 30'	
	l 53° 98'	l 54° 36'	l 52° 48'	l 53° 26'	l 51° 88'	h 51° 02'	h 52° 34'	h 53° 66'	l 52° 56'	l 51° 72'	
	53° 50'	55° 14'	52° 86'	54° 19'	51° 98'	51° 35'	53° 79'	52° 61'	52° 85'	52° 51'	M = 53''·08
Lesser Circle-reading	0° 1'	180° 1'	7° 12'	187° 18'	14° 25'	194° 25'	21° 37'	201° 37'	28° 49'	208° 49'	
† (XVII) & (XIX)	h 53° 48'	h 52° 80'	h 52° 54'	l 52° 34'	h 51° 76'	h 53° 28'	h 51° 90'	h 50° 80'	l 53° 06'	h 52° 22'	w = 21 '46 1/w = 0 '05 C = 48° 55' 52''·45
	h 53° 32'	l 51° 72'	h 53° 32'	l 52° 00'	h 52° 96'	h 52° 52'	h 52° 74'	h 51° 20'	l 51° 28'	l 50° 54'	
	h 53° 80'	l 51° 44'	h 52° 82'	l 52° 40'	h 51° 74'	h 51° 76'	h 51° 64'	l 52° 24'	l 53° 08'	l 50° 16'	
	l 53° 66'								h 50° 70'	l 50° 56'	
	53° 57'	51° 99'	52° 89'	52° 25'	52° 15'	52° 52'	52° 09'	51° 41'	52° 08'	50° 87'	M = 52''·18

NOTE.—(XVII) and (XIX) appertain to base-line figures.

At CXLIX											
*February 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1. †November 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXLVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 13'	187° 13'	14° 24'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
* CXLVII & CXLVIII	h 57° 86	h 57° 20	h 58° 18	h 58° 20	h 57° 10	h 59° 16	l 57° 54	l 58° 34	l 57° 68	l 58° 62	M = 58"·19
	h 59° 18	h 57° 26	h 58° 82	h 58° 56	h 56° 52	h 59° 80	l 57° 16	l 59° 36	l 58° 52	l 58° 70	
	58° 52	57° 23	58° 50	58° 38	56° 81	59° 48	57° 35	58° 85	58° 10	58° 66	
Lesser Circle-reading	285° 4'	55° 4'	242° 16'	62° 16'	249° 29'	66° 29'	256° 40'	76° 40'	263° 52'	83° 52'	
+ CXLVII & CXLVIII	h 59° 04	h 59° 36	h 61° 28	l 60° 06	l 61° 14	h 61° 44	h 57° 74	l 61° 80	l 58° 64	l 59° 84	w = 26·92 I = 0·04 C = 66° 55' 58"·83  M = 59"·46
	h 60° 32	h 58° 24	h 59° 58	l 59° 08	l 59° 88	h 60° 16	h 57° 64	l 57° 20	l 60° 66	l 59° 34	
	h 60° 14	h 59° 50	l 59° 04	l 60° 38	l 58° 96	h 59° 68	l 58° 60	l 57° 46	l 57° 42	l 58° 30	
			l 59° 72		l 60° 44			l 58° 58	l 60° 36		
					h 59° 90			l 59° 26	l 59° 26		
								l 60° 18			
								l 59° 34			
Lesser Circle-reading	66° 57'	246° 57'	74° 9'	254° 9'	81° 20'	261° 20'	88° 38'	268° 38'	95° 45'	275° 45'	
* CXLVIII & (XIX)	h 46° 34	h 43° 80	h 44° 74	h 45° 86	h 45° 92	h 47° 52	l 45° 34	l 47° 76	l 43° 56	l 44° 94	M = 45"·36
	h 44° 24	h 45° 02	h 44° 84	h 45° 14	h 45° 86	h 46° 78	l 45° 66	l 46° 32	l 43° 54	l 44° 08	
	45° 29	44° 41	44° 79	45° 50	45° 89	47° 15	45° 50	47° 04	43° 55	44° 51	
Lesser Circle-reading	302° 0'	122° 0'	309° 12'	129° 12'	316° 25'	136° 25'	323° 38'	143° 38'	330° 48'	150° 48'	
+ CXLVIII & (XIX)	h 43° 84	h 46° 16	h 44° 18	l 44° 58	l 44° 88	h 44° 24	h 44° 92	l 42° 74	l 44° 22	l 44° 44	w = 19·64 I = 0·05 C = 58° 0' 44"·83  M = 44"·53
	h 43° 70	h 46° 20	h 44° 14	l 44° 34	l 43° 42	h 43° 60	l 44° 22	l 46° 00	l 42° 44	l 44° 56	
	h 44° 34	h 46° 52	h 45° 12	l 44° 66	l 44° 84	h 42° 92	l 44° 98	l 47° 52	l 45° 00	l 45° 02	
								l 45° 06	l 42° 68		
								l 44° 24	l 43° 72		
								l 44° 42			
								l 45° 68			
	43° 96	46° 29	44° 48	44° 53	44° 38	43° 59	44° 71	45° 09	43° 61	44° 67	

NOTE.—(XIX) appertains to base-line figures.

At (XVII)											
*February 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1.											
†October 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on (XIX)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	119° 29'	299° 30'	126° 40'	306° 40'	133° 52'	313° 52'	141° 4'	321° 4'	148° 17'	328° 17'	
* (XIX) & CXLVIII	l 41° 66'	l 44° 36'	l 47° 42'	l 45° 22'	l 45° 42'	h 44° 44'	h 43° 48'	h 43° 80'	h 41° 22'	h 42° 90'	M = 43'' 85
	l 44° 46'	l 42° 74'	l 46° 20'	l 41° 54'	l 45° 22'	h 44° 42'	h 42° 96'	h 42° 36'	h 43° 42'	h 43° 66'	
	43° 06'	43° 55'	46° 81'	43° 38'	45° 32'	44° 43'	43° 22'	43° 08'	42° 32'	43° 28'	
Lesser Circle-reading	278° 38'	98° 38'	285° 51'	106° 51'	293° 2'	113° 2'	300° 15'	120° 15'	307° 28'	127° 26'	
† (XIX) & CXLVIII	h 45° 56'	h 45° 52'	h 43° 90'	l 45° 78'	l 43° 80'	l 43° 06'	l 46° 66'	l 44° 96'	l 47° 02'	l 43° 92'	w = 13 '46 I = 0 '07 w C = 47° 41' 44'' 46
	h 44° 90'	h 44° 32'	h 43° 38'	l 44° 16'	l 43° 72'	l 42° 96'	l 46° 56'	l 45° 72'	l 45° 08'	l 43° 12'	
	h 43° 86'	h 44° 18'	l 43° 24'	l 45° 32'	l 42° 58'	l 43° 94'	l 46° 00'	l 45° 88'	l 45° 52'	l 44° 20'	
				l 45° 98'	l 44° 66'	l 46° 36'					
	44° 77'	44° 67'	43° 51'	45° 09'	44° 33'	43° 66'	46° 40'	45° 52'	45° 87'	43° 75'	M = 44'' 76
Lesser Circle-reading	167° 11'	347° 11'	174° 22'	354° 22'	181° 33'	1° 33'	188° 46'	8° 46'	195° 58'	15° 58'	
* CXLVIII & CXLVI	l 46° 28'	l 47° 54'	l 46° 60'	l 46° 44'	l 46° 76'	h 48° 66'	h 44° 08'	h 46° 22'	h 45° 12'	h 45° 46'	M = 46'' 23
	l 45° 34'	l 48° 30'	l 47° 16'	l 47° 86'	l 43° 40'	h 47° 98'	h 45° 08'	h 45° 90'	h 45° 32'	h 45° 18'	
	45° 81'	47° 92'	46° 88'	47° 15'	45° 08'	48° 32'	44° 58'	46° 06'	45° 22'	45° 32'	
Lesser Circle-reading	326° 20'	146° 20'	333° 32'	153° 32'	340° 44'	160° 44'	347° 57'	167° 57'	355° 8'	175° 8'	
† CXLVIII & CXLVI	h 45° 74'	h 46° 62'	h 44° 96'	l 44° 12'	l 46° 22'	l 46° 00'	l 45° 80'	l 46° 08'	l 44° 72'	l 46° 56'	w = 21 '11 I = 0 '05 w C = 33° 40' 45'' 75
	h 45° 50'	h 45° 86'	h 44° 64'	l 45° 58'	l 45° 84'	l 45° 96'	l 44° 78'	l 44° 70'	l 43° 76'	l 46° 92'	
	h 46° 38'	h 46° 86'	l 44° 98'	l 44° 98'	l 44° 12'	l 46° 02'	l 46° 52'	l 44° 34'	l 45° 14'	l 46° 28'	
				l 47° 46'							
	45° 87'	46° 45'	44° 86'	44° 89'	45° 91'	45° 99'	45° 70'	45° 04'	44° 54'	46° 59'	M = 45'' 58

NOTE.—(XVII) and (XIX) appertain to base-line figures.

At (XIX)											
*February 1852, observed by Mr. G. Logan with Colonel Waugh's 24-inch Theodolite No. 1. †October 1860, observed by Major J. T. Walker and Lieutenants J. Herschel and H. R. Thullier with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on CXLIX										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2'	180° 2'	7° 12'	187° 12'	14° 24'	194° 25'	21° 37'	201° 37'	28° 48'	208° 48'	
* CXLIX & CXLVIII	"	"	"	"	"	"	"	"	"	"	
	h 49° 68 h 50° 70	h 48° 06 h 48° 42	h 50° 52 h 49° 22	h 50° 64 h 51° 20	h 50° 62 h 51° 36	l 48° 04 l 49° 90	l 52° 42 l 50° 70	h 48° 94 h 51° 14 h 49° 94	h 47° 94 h 48° 54	h 48° 46 h 48° 64	
	50° 19	48° 24	49° 87	50° 92	50° 99	48° 97	51° 56	50° 01	48° 24	48° 55	M = 49'' 75
Lesser Circle-reading	220° 11'	40° 11'	227° 23'	47° 23'	234° 34'	54° 84'	241° 48'	61° 48'	248° 58'	68° 57'	
+ CXLIX & CXLVIII	h 53° 60 l 53° 20 l 53° 76	l 52° 62 l 52° 50 l 54° 18	l 53° 50 l 53° 08 l 51° 18 h 52° 86	l 52° 30 l 52° 76 l 50° 70	l 51° 62 l 51° 14 l 51° 00	l 48° 92 l 50° 94 h 51° 14 h 51° 68	l 50° 56 h 53° 20 h 52° 82 h 51° 62	l 52° 52 l 51° 64 l 51° 94 h 48° 84	d 50° 99 d 51° 65 d 51° 27	d 49° 56 d 49° 56 d 49° 08 l 50° 82 l 50° 70 l 52° 32	w = 13.66 1/w = 0.07 C = 56° 27' 50'' 88
	53° 52	53° 10	52° 66	51° 92	51° 25	50° 67	52° 05	51° 24	51° 30	50° 34	M = 51'' 81
Lesser Circle-reading	56° 29'	236° 30'	63° 40'	243° 40'	70° 52'	256° 52'	78° 4'	258° 4'	85° 16'	265° 16'	
* CXLVIII & (XVII)	h 29° 36 h 27° 30 h 26° 92	h 27° 54 h 28° 86 h 27° 04	h 26° 78 h 27° 04 h 26° 91	h 29° 36 h 28° 70 h 26° 03	l 26° 44 l 26° 76 h 26° 60	l 28° 32 l 29° 34 h 28° 83	l 28° 72 l 26° 36 l 27° 98	h 29° 98 h 28° 12 h 28° 94	h 28° 46 h 28° 60	h 27° 88 h 28° 76	
	27° 86	28° 20	26° 91	29° 03	26° 60	28° 83	27° 69	29° 01	28° 53	28° 32	M = 28'' 10
Lesser Circle-reading	276° 88'	96° 39'	283° 51'	108° 51'	291° 2'	111° 2'	298° 16'	118° 16'	305° 25'	125° 25'	
+ CXLVIII & (XVII)	h 26° 48 l 26° 84 l 26° 90	l 28° 74 l 27° 82 l 28° 32	l 24° 98 l 25° 12 l 26° 48 h 27° 28 h 28° 32 h 27° 44	l 28° 54 l 27° 82 l 28° 36	l 28° 50 l 29° 06 l 27° 78	h 26° 70 h 27° 54 h 27° 58	l 29° 04 l 27° 72 l 27° 96	l 30° 10 l 30° 04 l 28° 28 l 29° 40	l 27° 72 l 28° 16 l 27° 96	l 28° 24 l 32° 64 l 32° 12 d 28° 86 d 28° 86 d 28° 38 h 29° 30	w = 18.36 1/w = 0.05 C = 83° 22' 28'' 10
	26° 74	28° 29	26° 60	28° 24	28° 45	27° 27	28° 24	29° 46	27° 95	29° 77	M = 28'' 10

NOTE.—(XVII) and (XIX) appertain to base-line figures.



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
(XXIV)	II & I	34	20.93	10	11.45	Troughton's 36".
"	I & (XXV)	34	15.11	10	22.68	
(XXV)	(XXIV) & I	33	20.25	10	7.48	
"	I & III	37	15.73	10	10.23	
I	II & IV	32	10.53	10	6.96	
"	IV & III	34	22.97	10	3.32	
"	III & (XXV)	30	7.47	10	5.00	
"	(XXV) & (XXIV)	32	10.38	10	2.45	
"	(XXIV) & II	30	10.54	10	8.81	
II	V & IV	31	11.87	10	5.15	
"	IV & I	37	26.59	10	5.02	
"	I & (XXIV)	32	13.71	10	10.97	
III	(XXV) & I	32	15.65	10	6.33	
"	I & IV	33	11.66	10	2.78	
"	IV & VI	31	9.68	10	8.49	
IV	II & V	32	15.68	10	1.81	
"	V & VI	32	15.33	10	7.23	
"	VI & III	33	17.22	10	10.89	
"	III & I	35	26.21	10	4.81	
"	I & II	32	14.27	10	12.04	
V	VII & VIII	32	12.44	10	5.73	
"	VIII & VI	34	18.12	10	2.83	
"	VI & IV	31	15.09	10	11.20	
"	IV & II	30	12.04	10	19.67	
VI	III & IV	30	12.45	10	5.09	
"	IV & V	33	15.01	10	6.23	
"	V & VII	31	13.88	10	7.47	
"	VII & VIII	30	8.19	10	4.55	
VII	IX & X	36	25.32	10	5.88	
"	X & VIII	33	16.17	10	2.55	
"	VIII & VI	30	5.18	10	6.38	
"	VI & V	32	13.21	10	9.96	

NOTE.—(XXIV) and (XXV) appertain to base-line figures.

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
VIII	VI & V	30	7'92	10	6'12	Troughton's 36".
"	V & VII	31	16'42	10	4'24	
"	VII & IX	31	10'34	10	2'51	
"	IX & X	30	10'11	10	2'84	
IX	XI & XII	31	13'66	10	7'28	
"	XII & X	31	10'05	10	11'92	
"	X & VIII	31	9'90	10	4'27	
"	VIII & VII	31	14'04	10	8'64	
X	VIII & VII	31	11'47	10	3'03	
"	VII & IX	30	14'18	10	4'65	
"	IX & XI	32	15'97	10	16'99	
"	XI & XII	32	14'32	10	11'29	
XI	XIII & XIV	30	4'94	10	3'86	
"	XIV & XII	30	4'80	10	2'72	
"	XII & X	30	7'07	10	3'97	
"	X & IX	30	4'78	10	2'47	
XII	X & IX	32	6'85	10	1'67	
"	IX & XI	32	5'82	10	13'72	
"	XI & XIII	30	10'37	10	7'52	
"	XIII & XIV	30	14'22	10	1'87	
XIII	XV & XVI	31	12'65	10	11'19	
"	XVI & XIV	31	7'69	10	9'25	
"	XIV & XII	31	10'03	10	8'11	
"	XII & XI	31	10'95	10	11'98	
XIV	XII & XI	33	22'35	10	11'71	
"	XI & XIII	33	7'07	10	3'74	
"	XIII & XV	31	10'03	10	7'20	
"	XV & XVI	31	7'45	10	8'80	
XV	XVII & XVIII	31	9'85	10	18'33	
"	XVIII & XVI	31	16'05	10	7'49	
"	XVI & XIV	31	14'11	10	6'24	
"	XIV & XIII	31	8'75	10	2'01	
XVI	XIV & XIII	30	7'26	10	9'68	



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XVI	XIII & XV	30	6.24	10	3.33	
"	XV & XVII	31	6.98	10	6.14	
"	XVII & XVIII	31	12.35	10	2.35	
XVII	XIX & XX	30	8.88	10	3.51	
"	XX & XVIII	30	3.71	10	2.52	
"	XVIII & XVI	30	4.35	10	2.34	
"	XVI & XV	30	6.23	10	7.99	
XVIII	XVI & XV	32	5.33	10	2.98	
"	XV & XVII	32	5.88	10	5.20	
"	XVII & XIX	32	11.44	10	8.75	
"	XIX & XX	32	15.12	10	8.09	
XIX	XXII & XXI	31	13.52	10	1.97	
"	XXI & XX	33	12.79	10	6.39	
"	XX & XVIII	30	11.14	10	2.79	
"	XVIII & XVII	30	12.11	10	5.13	
XX	XVIII & XVII	34	17.83	10	4.97	
"	XVII & XIX	34	23.30	10	3.96	Troughton's 36".
"	XIX & XXI	30	8.05	10	5.96	
"	XXI & XXIII	31	16.67	10	9.86	
XXI	XIX & XXII	30	10.54	10	8.53	
"	XXII & XXIV	31	16.93	10	5.89	
"	XXIV & XXV	32	18.68	10	3.65	
"	XXV & XXIII	31	22.37	10	13.77	
"	XXIII & XX	31	11.66	10	6.92	
"	XX & XIX	34	28.44	10	2.61	
XXII	XXIV & XXI	30	7.77	10	2.16	
"	XXI & XIX	30	6.95	10	4.27	
XXIII	XX & XXI	31	23.34	10	11.47	
"	XXI & XXV	32	24.11	10	6.14	
XXIV	XXVII & XXVI	31	24.25	10	9.23	
"	XXVI & XXV	31	22.85	10	13.64	
"	XXV & XXI	32	18.26	10	8.17	
"	XXI & XXII	31	14.64	10	3.50	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XXV	XXIII & XXI	32	20.92	10	6.79	Troughton's 36".
"	XXI & XXIV	35	38.90	10	6.54	
"	XXIV & XXVI	35	35.80	10	9.11	
"	XXVI & XXVIII	33	27.90	10	3.79	
XXVI	XXX & XXVIII	33	22.32	10	1.95	
"	XXVIII & XXV	33	28.70	10	14.53	
"	XXV & XXIV	32	20.76	10	12.30	
"	XXIV & XXVII	32	18.09	10	6.14	
"	XXVII & XXIX	35	50.31	10	11.40	
"	XXIX & XXX	34	27.49	10	3.97	
XXVII	XXIX & XXVI	32	14.99	10	5.54	Waugh's 24" No. 1.
"	XXVI & XXIV	33	25.49	10	24.67	
XXVIII	XXV & XXVI	33	25.17	10	12.20	
"	XXVI & XXX	34	36.39	10	9.90	
XXIX	XXXII & XXXI	31	22.71	10	13.90	
"	XXXI & XXX	30	15.49	10	14.55	
"	XXX & XXVI	31	14.26	10	3.16	
"	XXVI & XXVII	32	30.55	10	6.01	
XXX	XXVIII & XXVI	31	9.79	10	9.12	
"	XXVI & XXIX	31	15.93	10	4.65	
"	XXIX & XXXI	32	14.36	10	11.71	Troughton's 36".
"	XXXI & XXXIII	32	15.79	10	7.27	
XXXI	XXXIII & XXX	35	24.26	10	2.84	
"	XXX & XXIX	34	15.52	10	5.80	
"	XXIX & XXXII	34	42.87	10	7.75	
"	XXXII & XXXV	34	24.34	10	10.92	
"	XXXV & XXXIV	32	21.34	10	15.75	
"	XXXIV & XXXIII	33	15.82	10	11.61	
XXXII	XXXVI & XXXV	32	15.10	10	5.69	
"	XXXV & XXXI	34	17.51	10	7.28	
"	XXXI & XXIX	33	15.28	10	3.97	Waugh's 24" No. 1.
XXXIII	XXX & XXXI	34	19.66	10	12.40	
"	XXXI & XXXIV	35	25.32	10	17.61	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XXXIV	XXXIII & XXXI	32	15'42	10	2'35	Waugh's 24" No. 1.
"	XXXI & XXXV	31	16'06	10	4'20	
"	XXXV & XXXVII	31	13'17	10	4'49	
XXXV	XXXI & XXXII	31	15'92	10	3'92	
"	XXXII & XXXVI	30	6'07	10	6'77	
"	XXXVI & XXXVII	30	5'86	10	3'77	
"	XXXVII & XXXIV	32	21'95	10	3'77	
"	XXXIV & XXXI	33	18'22	10	9'68	
XXXVI	XXXIX & XXXVIII	33	23'77	10	19'71	
"	XXXVIII & XXXVII	33	14'54	10	6'02	
"	XXXVII & XXXV	33	15'34	10	4'80	
"	XXXV & XXXII	30	6'57	10	7'60	
XXXVII	XXXIV & XXXV	31	9'80	10	4'98	
"	XXXV & XXXVI	32	7'46	10	13'59	
"	XXXVI & XXXVIII	32	9'46	10	10'08	
"	XXXVIII & XL	33	23'86	10	10'12	
XXXVIII	XXXVII & XXXVI	34	22'67	10	5'79	
"	XXXVI & XXXIX	33	18'70	10	3'37	
"	XXXIX & XLI	32	37'99	10	18'18	
"	XLI & XLII	32	17'72	10	11'27	
"	XLII & XL	31	12'98	10	14'64	
"	XL & XXXVII	32	17'29	10	3'13	
XXXIX	XLI & XXXVIII	32	22'56	10	10'14	
"	XXXVIII & XXXVI	31	11'16	10	3'78	
XL	XXXVII & XXXVIII	30	9'40	10	8'90	
"	XXXVIII & XLII	30	8'82	10	7'17	
"	XLII & XLIV	30	5'63	10	10'70	
XLI	XLIII & XLII	32	21'22	10	12'35	
"	XLII & XXXVIII	33	18'08	10	11'35	
"	XXXVIII & XXXIX	33	19'54	10	10'79	
XLII	XL & XXXVIII	31	11'01	10	3'50	
"	XXXVIII & XLI	32	21'38	10	12'59	
"	XLI & XLIII	33	24'15	10	6'91	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XLII	XLIII & XLV	31	10'21	10	6'63	Waugh's 24" No. 1.
"	XLV & XLIV	31	18'47	10	10'72	
"	XLIV & XL	30	9'02	10	4'93	
XLIII	XLVII & XLV	32	17'22	10	7'29	
"	XLV & XLII	31	15'34	10	2'27	
"	XLII & XLI	30	7'85	10	2'40	
XLIV	XL & XLII	31	11'27	10	5'24	
"	XLII & XLV	33	17'40	10	6'56	
"	XLV & XLVI	32	11'96	10	2'38	
XLV	XLVI & XLIV	30	7'02	10	1'56	
"	XLIV & XLII	31	9'69	10	3'90	
"	XLII & XLIII	32	23'20	10	17'07	
"	XLIII & XLVII	31	18'88	10	3'89	
"	XLVII & XLVIII	31	13'11	10	6'55	
"	XLVIII & XLVI	31	13'94	10	18'58	
XLVI	XLIV & XLV	31	13'70	10	6'72	
"	XLV & XLVIII	30	13'15	10	3'83	
XLVII	L & XLIX	31	11'94	10	3'38	
"	XLIX & XLVIII	33	19'21	10	2'51	
"	XLVIII & XLV	32	16'96	10	2'48	
"	XLV & XLIII	30	7'54	10	2'70	
XLVIII	XLVI & XLV	31	8'03	10	3'08	
"	XLV & XLVII	31	11'01	10	2'62	
"	XLVII & XLIX	32	16'99	10	3'50	
"	XLIX & LI	31	14'95	10	3'10	
XLIX	LI & XLVIII	32	15'79	10	0'86	
"	XLVIII & XLVII	33	14'62	10	10'73	
"	XLVII & L	31	10'91	10	12'08	
"	L & LII	30	15'79	10	7'48	
"	LII & LIII	31	14'67	10	15'53	
"	LIII & LI	33	14'06	10	15'28	
L	LII & XLIX	31	15'29	10	5'27	
"	XLIX & XLVII	30	10'13	10	3'54	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LI	XLVIII & XLIX	34	35.01	10	13.31	} Waugh's 24" No. 1.
"	XLIX & LIII	35	35.50	10	9.23	
"	LIII & LV	36	29.05	10	9.61	
LII	LIV & LIII	33	45.45	10	2.29	
"	LIII & XLIX	31	23.03	10	11.76	
"	XLIX & L	31	13.84	10	4.92	
LIII	LI & XLIX	31	14.90	10	1.74	
"	XLIX & LII	30	5.23	10	11.50	
"	LII & LIV	32	16.25	10	6.30	
"	LIV & LVI	30	9.36	10	9.28	
"	LVI & LV	30	9.16	10	15.08	
"	LV & LI	30	10.83	10	9.55	
LIV	LVIII & LVI	30	9.74	10	8.03	} Troughton's 36".
"	LVIII & LVI	34	36.55	10	6.47	
"	LVI & LIII	33	23.84	10	3.33	
"	LIII & LII	31	14.81	10	4.60	} Waugh's 24" No. 1.
LV	LI & LIII	32	29.41	10	2.19	
"	LIII & LVI	32	17.09	10	20.91	
"	LVI & LVII	33	34.07	10	10.41	} Troughton's 36".
"	LVI & LVII	30	7.42	10	11.49	
LVI	LIX & LVII	34	25.84	10	21.96	
"	LVII & LV	32	27.53	10	9.61	} Waugh's 24" No. 1.
"	LV & LIII	34	25.49	10	6.07	
"	LIII & LIV	33	26.42	10	4.81	
"	LIV & LVIII	32	25.54	10	6.80	
"	LVIII & LIX	33	14.95	10	20.54	
"	LIX & LVII	33	17.09	10	6.01	
"	LVII & LV	34	26.11	10	7.69	} Troughton's 36".
"	LIV & LVIII	31	16.37	10	10.51	
"	LVIII & LIX	33	32.21	10	4.01	
LVII	LV & LVI	33	24.26	10	4.61	} Waugh's 24" No. 1.
"	LVI & LIX	32	19.77	10	20.77	
"	LV & LVI	33	16.22	10	6.72	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LVII	LVI & LIX	34	13'70	10	15'75	Troughton's 36".
LVIII	LXI & LX	33	16'86	10	7'90	} Waugh's 24" No. 1.
"	LX & LIX	30	15'93	10	3'48	
"	LIX & LVI	32	16'04	10	4'01	
"	LVI & LIV	33	29'25	10	8'31	
"	LXI & LX	34	34'08	10	4'91	} Troughton's 36".
"	LX & LIX	36	34'88	10	14'28	
"	LIX & LVI	34	27'91	10	9'49	
"	LVI & LIV	35	52'37	10	7'52	
LIX	LVII & LVI	33	21'72	10	12'49	} Waugh's 24" No. 1.
"	LVI & LVIII	32	12'95	10	17'48	
"	LVIII & LX	34	21'03	10	4'84	
"	LX & LXII	33	21'29	10	17'30	
"	LVII & LVI	36	29'27	10	13'58	} Troughton's 36".
"	LVI & LVIII	34	23'19	10	11'27	
"	LVIII & LX	38	40'60	10	6'24	
"	LX & LXII	41	55'06	10	13'90	
LX	LXI & LXIII	33	32'56	10	1'40	} Waugh's 24" No. 1.
"	LXIII & LXIV	34	33'14	10	20'99	
"	LXIV & LXII	32	13'79	10	7'02	
"	LXII & LIX	32	18'78	10	6'78	
"	LIX & LVIII	34	37'20	10	9'84	} Troughton's 36".
"	LVIII & LXI	33	22'04	10	6'91	
"	LXI & LXIII	41	78'69	10	4'37	
"	LXIII & LXV	56	119'77	10	12'18	
"	LXV & LXII	51	94'47	10	7'04	} Troughton's 36".
"	LXII & LIX	37	37'19	10	12'74	
"	LIX & LVIII	36	24'62	10	13'38	
"	LVIII & LXI	35	21'10	10	6'46	
LXI	LXIII & LX	34	24'67	10	13'05	} Waugh's 24" No. 1.
"	LX & LVIII	34	14'91	10	5'08	
"	LXIII & LX	30	10'26	10	4'49	} Troughton's 36".
"	LX & LVIII	30	10'16	10	5'39	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LXII	LIX & LX	32	18.19	10	11.97	} Waugh's 24" No. 1.
"	LX & LXIV	32	33.85	10	8.29	
"	LIX & LX	34	29.08	10	10.05	} Troughton's 36".
"	LX & LXV	48	120.54	10	11.53	
LXIII	LXVII & LXVI	30	10.37	10	9.60	} Waugh's 24" No. 1.
"	LXVI & LXIV	33	18.52	10	5.03	
"	LXIV & LX	33	48.74	10	18.80	
"	LX & LXI	34	22.64	10	19.68	
"	LXVI & LXV	37	99.68	10	2.49	} Troughton's 36".
"	LXV & LX	44	77.66	10	10.15	
"	LX & LXI	38	60.20	10	4.51	
LXIV	LXII & LX	34	28.10	10	7.24	} Waugh's 24" No. 1.
"	LX & LXIII	34	8.89	10	2.08	
"	LXIII & LXVI	34	13.38	10	2.00	
"	LXVI & LXVIII	35	35.60	10	2.98	} Troughton's 36".
LXV	LXII & LX	44	124.56	10	14.90	
"	LX & LXIII	37	31.58	10	3.24	
"	LXIII & LXVI	41	46.80	10	4.01	
"	LXVI & LXVIII	45	138.66	10	5.80	} Waugh's 24" No. 1.
LXVI	LXVIII & LXIV	32	10.43	10	1.61	
"	LXIV & LXIII	30	11.96	10	1.78	
"	LXIII & LXVII	30	12.55	10	10.68	} Troughton's 36".
"	LXVII & LXIX	30	11.87	10	42.99	
"	LXIX & LXX	31	16.33	10	20.24	
"	LXX & LXVIII	31	13.39	10	6.93	
"	LXVIII & LXV	43	129.68	10	3.88	} Troughton's 36"
"	LXV & LXIII	50	160.14	10	18.83	
LXVII	LXIX & LXVI	33	24.15	10	5.29	} Waugh's 24" No. 1.
"	LXVI & LXIII	32	20.07	10	7.24	
LXVIII	LXIV & LXVI	30	6.06	10	7.95	} Troughton's 36".
"	LXV & LXVI	39	36.89	10	12.79	
"	LXVI & LXX	31	16.02	10	4.17	} Waugh's 24" No. 1.
LXIX	LXXII & LXXI	31	17.76	10	4.41	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LXIX	LXXI & LXX	33	24.02	10	4.92	} Waugh's 24" No. 1.
"	LXX & LXVI	32	18.17	10	4.77	
"	LXVI & LXVII	31	12.87	10	7.34	
LXX	LXVIII & LXVI	32	22.56	10	5.99	
"	LXVI & LXIX	31	12.48	10	1.98	
"	LXIX & LXXI	32	18.36	10	3.74	
"	LXXI & LXXIII	32	17.58	10	11.00	
LXXI	LXXIII & LXX	31	12.38	10	5.20	
"	LXX & LXIX	31	20.26	10	6.43	
"	LXIX & LXXII	32	16.99	10	14.55	
"	LXXII & LXXIV	32	19.25	10	7.15	
"	LXXIV & LXXV	31	20.27	10	4.62	
"	LXXV & LXXIII	31	14.86	10	3.15	
LXXII	LXXIV & LXXI	30	8.34	10	3.29	
"	LXXI & LXIX	30	7.52	10	9.23	
LXXIII	LXX & LXXI	32	15.32	10	8.76	} Troughton's 36".
"	LXXI & LXXV	32	16.99	10	8.75	
"	LXXV & LXXXI	37	45.84	10	4.04	
"	LXXXI & LXXXII	36	39.02	10	3.41	} Waugh's 24" No. 1.
LXXIV	LXXVII & LXXVI	30	9.37	10	12.56	
"	LXXVI & LXXV	30	8.94	10	13.09	
"	LXXV & LXXI	31	18.23	10	3.11	
"	LXXI & LXXII	31	14.07	10	2.26	
LXXV	LXXIII & LXXI	30	8.57	10	7.45	} Troughton's 36".
"	LXXI & LXXIV	31	19.98	10	8.41	
"	LXXIV & LXXVI	31	15.09	10	3.84	
"	LXXVI & LXXVIII	30	14.00	10	24.67	} Waugh's 24" No. 1.
"	LXXVIII & LXXXI	34	24.16	10	3.69	
"	LXXXI & LXXIII	36	31.17	10	4.16	} Troughton's 36".
LXXVI	LXXV & LXXIV	31	10.16	10	6.02	
"	LXXIV & LXXVII	34	26.34	10	5.32	
"	LXXVII & LXXIX	31	17.78	10	9.14	
"	LXXIX & LXXX	31	22.30	10	6.96	} Waugh's 24" No. 1.



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LXXXVI	LXXX & LXXVIII	30	14'23	10	2'23	Waugh's 24" No. 1.
"	LXXVIII & LXXV	30	11'37	10	2'55	
LXXVII	LXXIX & LXXXVI	32	11'62	10	9'06	
"	LXXXVI & LXXIV	32	15'77	10	3'26	Troughton's 36".
LXXVIII	LXXXIII & LXXXI	35	28'23	10	10'11	
"	LXXXI & LXXV	31	16'15	10	3'15	
"	LXXXV & LXXVI	32	20'07	10	1'43	Waugh's 24" No. 1.
"	LXXXVI & LXXX	32	14'97	10	3'44	
LXXXIX	LXXXVI & LXXXV	31	20'31	10	4'92	
"	LXXXV & LXXX	30	15'93	10	6'33	Troughton's 36".
"	LXXX & LXXVI	31	15'90	10	5'59	
"	LXXXVI & LXXVII	32	21'19	10	2'23	
LXXX	LXXVIII & LXXVI	35	29'87	10	11'17	Waugh's 24" No. 1.
"	LXXXVI & LXXIX	32	12'12	10	4'32	
"	LXXIX & LXXXV	31	11'18	10	9'37	
"	LXXXV & LXXXVII	34	48'08	10	7'70	Troughton's 36".
LXXXI	LXXXII & LXXIII	38	46'91	10	7'42	
"	LXXIII & LXXV	33	37'14	10	9'61	
"	LXXXV & LXXVIII	40	58'70	10	5'06	Troughton's 36".
"	LXXVIII & LXXXIII	39	32'55	10	6'01	
"	LXXXIII & LXXXIV	35	29'20	10	2'98	
"	LXXXIV & LXXXII	41	63'62	10	6'43	Troughton's 36".
LXXXII	LXXIII & LXXXI	33	17'49	10	2'23	
"	LXXXI & LXXXIV	35	23'44	10	10'95	
LXXXIII	LXXXIV & LXXXI	41	63'13	10	9'34	Troughton's 36".
"	LXXXI & LXXVIII	37	51'00	10	1'82	
LXXXIV	LXXXII & LXXXI	37	41'30	10	7'89	
"	LXXXI & LXXXIII	37	43'01	10	5'81	Troughton's 36".
LXXXV	LXXXVIII & LXXXIX	32	25'35	10	11'74	
"	LXXXIX & LXXXVII	32	35'07	10	9'17	
"	LXXXVII & LXXX	32	37'59	10	4'95	Troughton's 36".
"	LXXX & LXXIX	33	35'56	10	14'33	
"	LXXIX & LXXXVI	31	19'25	10	5'62	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
LXXXV	LXXXVI & LXXXVIII	32	21'51	10	7'71	Troughton's 36".
LXXXVI	LXXXVIII & LXXXV	31	16'07	10	5'80	
"	LXXXV & LXXIX	30	14'03	10	6'73	
LXXXVII	LXXX & LXXXV	32	28'61	10	12'79	
"	LXXXV & LXXXIX	38	55'54	10	13'46	
LXXXVIII	XCI & XC	31	13'59	10	9'53	
"	XC & LXXXIX	31	13'55	10	7'69	
"	LXXXIX & LXXXV	31	21'48	10	3'44	
"	LXXXV & LXXXVI	32	32'00	10	2'69	
LXXXIX	LXXXVII & LXXXV	34	43'63	10	5'15	
"	LXXXV & LXXXVIII	36	61'34	10	5'32	
"	LXXXVIII & XC	33	36'85	10	4'86	
"	XC & XCII	32	27'32	10	5'21	
XC	XCIII & XCIV	36	56'23	10	9'49	
"	XCIV & XCII	34	27'66	10	8'86	
"	XCII & LXXXIX	32	40'04	10	8'96	
"	LXXXIX & LXXXVIII	30	15'64	10	7'64	
"	LXXXVIII & XCI	31	20'05	10	6'90	
"	XCI & XCIII	33	25'67	10	5'64	
XCI	XCIII & XC	31	21'37	10	6'35	
"	XC & LXXXVIII	32	22'53	10	5'25	
XCII	LXXXIX & XC	31	13'66	10	5'19	
"	XC & XCIV	40	70'71	10	9'71	
XCIII	XCVI & XCV	30	13'57	10	4'56	
"	XCV & XCIV	31	25'62	10	4'29	
"	XCIV & XC	33	19'55	10	8'68	
"	XC & XCI	30	11'41	10	8'00	
XCIV	XCII & XC	34	40'66	10	10'78	
"	XC & XCIII	36	33'36	10	12'57	
"	XCIII & XCV	32	11'26	10	14'54	
"	XCV & XCVII	31	18'57	10	6'63	
XCV	XCVIII & XCIX	33	52'42	10	8'27	
"	XCIX & XCVII	34	32'67	10	12'40	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
XCV	XCVII & XCIV	33	30'55	10	8'91	Troughton's 36".
"	XCIV & XCIII	36	49'54	10	5'07	
"	XCIII & XCVI	34	44'73	10	5'59	
"	XCVI & XCVIII	33	42'56	10	9'23	
XCVI	XCVIII & XCV	32	22'50	10	8'54	
"	XCV & XCIII	35	21'44	10	10'34	
XCVII	XCIV & XCV	30	19'93	10	2'34	
"	XCV & XCIX	30	18'00	10	3'06	
XCVIII	CI & C	33	17'01	10	5'54	
"	C & XCIX	33	23'32	10	5'00	
"	XCIX & XCV	35	54'96	10	7'34	
"	XCV & XCVI	31	18'63	10	7'85	
XCIX	XCVII & XCV	34	22'49	10	15'50	
"	XCV & XCVIII	30	11'64	10	5'83	
"	XCVIII & C	32	29'71	10	8'39	
"	C & CII	31	20'97	10	11'54	
C	CII & CIV	36	48'78	10	10'16	
"	CIV & CII	38	49'37	10	9'89	
"	CII & XCLX	33	29'73	10	6'24	
"	XCIX & XCVIII	33	28'27	10	12'13	
"	XCVIII & CI	32	26'19	10	5'91	
"	CI & CII	33	34'54	10	13'74	
CI	CII & C	30	7'97	10	4'53	
"	C & XCVIII	30	10'78	10	7'52	
CII	XCIX & C	31	19'28	10	7'99	
"	C & CIV	32	26'41	10	6'13	
CIII	CVI & CV	32	24'04	10	7'27	
"	CV & CIV	31	10'46	10	5'14	
"	CIV & C	34	23'52	10	6'44	
"	C & CI	37	90'69	10	4'79	
CIV	CII & C	38	57'95	10	15'54	
"	C & CIII	34	37'11	10	14'06	
"	CIII & CV	45	83'20	10	18'53	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
CIV	CV & CVII	31	16.36	10	6.21	
CV	CVII & CIV	34	18.19	10	5.22	
"	CIV & CIII	37	55.83	10	12.01	
"	CIII & CVI	38	78.09	10	6.79	
"	CVI & CIX	35	65.27	10	3.55	
"	CIX & CVIII	37	61.47	10	5.56	
"	CVIII & CVII	34	33.78	10	4.11	
CVI	CX & CIX	36	42.72	10	6.86	
"	CIX & CV	41	95.01	10	4.95	
"	CV & CIII	33	34.86	10	8.45	
CVII	CIV & CV	35	60.51	10	6.10	
"	CV & CVIII	34	28.26	10	4.91	
CVIII	CVII & CV	32	25.37	10	8.98	
"	CV & CIX	31	11.78	10	13.73	
"	CIX & CXII	32	19.97	10	8.62	
CIX	CVIII & CV	37	53.32	10	3.82	
"	CV & CVI	33	26.37	10	6.21	Troughton's 36".
"	CVI & CX	41	48.40	10	13.36	
"	CX & CXI	36	56.31	10	16.82	
"	CXI & CXII	37	38.58	10	11.57	
"	CXII & CVIII	33	26.28	10	11.12	
CX	CXI & CIX	31	7.71	10	1.69	
"	CIX & CVI	32	18.57	10	4.50	
CXI	CXIV & CXIII	35	59.46	10	9.60	
"	CXIII & CXII	34	26.24	10	7.60	
"	CXII & CIX	37	52.18	10	6.05	
"	CXII & CIX	31	14.15	10	4.04	
"	CIX & CX	36	40.36	10	17.41	
CXII	CVIII & CIX	30	17.25	10	8.11	
"	CIX & CXI	30	14.50	10	11.95	
"	CXI & CXIII	37	77.73	10	9.55	
"	CXIII & CXV	35	26.45	10	3.90	
CXIII	CXIV & CXVI	35	32.74	10	11.53	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
CXIII	CXVI & CXVII	34	30.83	10	8.72	
"	CXVII & CXV	38	31.58	10	10.80	
"	CXV & CXII	33	19.39	10	8.76	
"	CXII & CXI	34	41.84	10	12.06	
"	CXI & CXIV	38	47.24	10	8.31	
CXIV	CXVI & CXIII	37	57.23	10	9.43	
"	CXIII & CXI	32	17.94	10	8.86	
CXV	CXII & CXIII	30	8.44	10	2.80	
"	CXIII & CXVII	32	19.13	10	8.10	
CXVI	CXIX & CXVIII	37	36.54	10	9.21	
"	CXVIII & CXVII	33	33.75	10	9.97	
"	CXVII & CXIII	35	32.63	10	10.35	
"	CXIII & CXIV	37	64.33	10	14.55	
CXVII	CXV & CXIII	33	27.02	10	12.46	
"	CXIII & CXVI	33	41.90	10	6.24	
"	CXVI & CXVIII	32	23.87	10	7.10	
"	CXVIII & CXX	32	24.02	10	5.40	Troughton's 36".
CXVIII	CXXII & CXX	36	33.76	10	16.17	
"	CXX & CXVII	33	22.40	10	10.58	
"	CXVII & CXVI	33	31.24	10	9.17	
"	CXVI & CXIX	39	95.21	10	12.72	
"	CXIX & CXXI	37	33.61	10	6.46	
"	CXXI & CXXII	37	55.62	10	11.79	
CXIX	CXXI & CXVIII	35	19.48	10	10.73	
"	CXVIII & CXVI	31	8.66	10	9.85	
CXX	CXVII & CXVIII	30	11.28	10	9.75	
"	CXVIII & CXXII	30	7.90	10	3.52	
CXXI	CXXIV & CXXIII	34	44.57	10	10.69	
"	CXXIII & CXXII	33	27.09	10	4.56	
"	CXXII & CXVIII	33	33.98	10	11.03	
"	CXVIII & CXIX	34	41.13	10	9.20	
CXXII	CXX & CXVIII	35	38.88	10	7.56	
"	CXVIII & CXXI	35	59.74	10	8.50	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
CXXII	CXXI & CXXIII	36	37.88	10	9.49	Troughton's 36".
"	CXXIII & CXXV	40	49.99	10	15.98	
CXXIII	CXXVII & CXXV	33	34.57	10	8.42	
"	CXXV & CXXII	34	48.16	10	10.29	
"	CXXII & CXXI	34	31.96	10	10.26	
"	CXXI & CXXIV	32	36.57	10	9.19	
"	CXXIV & CXXVI	34	31.17	10	4.24	
"	CXXVI & CXXVII	36	32.45	10	12.67	
CXXIV	CXXVI & CXXIII	31	13.70	10	3.26	
"	CXXIII & CXXI	33	38.67	10	8.90	
CXXV	CXXII & CXXIII	33	30.21	10	8.97	
"	CXXIII & CXXVII	33	2.47	10	5.32	
CXXVI	CXXIX & CXXVIII	33	31.33	10	10.05	
"	CXXVIII & CXXVII	34	24.09	10	9.42	
"	CXXVII & CXXIII	30	11.55	10	7.88	
"	CXXIII & CXXIV	35	30.34	10	14.36	
CXXVII	CXXV & CXXIII	31	13.63	10	13.65	
"	CXXIII & CXXVI	31	22.80	10	12.44	
"	CXXVI & CXXVIII	32	25.79	10	2.41	
"	CXXVIII & CXXX	33	28.13	10	7.76	
CXXVIII	CXXIX & CXXXI	38	38.09	10	17.05	
"	CXXXI & CXXXII	31	20.47	10	6.99	
"	CXXXII & CXXX	33	24.85	10	8.20	
"	CXXX & CXXVII	37	38.23	10	14.77	
"	CXXVII & CXXVI	33	35.03	10	10.30	
"	CXXVI & CXXIX	34	26.68	10	9.31	
CXXIX	CXXXI & CXXVIII	30	8.30	10	3.26	
"	CXXVIII & CXXVI	43	69.15	10	7.51	
CXXX	CXXVII & CXXVIII	33	26.84	10	3.27	
"	CXXVIII & CXXXII	33	28.94	10	3.64	
CXXXI	CXXXIII & CXXXIV	33	40.78	10	7.44	
"	CXXXIV & CXXXII	35	35.83	10	8.21	
"	CXXXII & CXXVIII	34	29.95	10	8.90	

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.	
CXXXI	CXXVIII & CXXIX	34	45'06	10	23'45	} Troughton's 36".	
CXXXII	CXXX & CXXVIII	33	26'39	10	10'13.		
"	CXXVIII & CXXXI	37	57'10	10	20'80		
"	CXXXI & CXXXIII	32	18'46	10	4'30		
"	CXXXIII & CXXXIV	31	14'13	10	9'35		
CXXXIII	CXXXV & CXXXVI	33	21'40	10	13'64		
"	CXXXVI & CXXXIV	35	32'68	10	6'18		
"	CXXXIV & CXXXII	34	19'36	10	16'11		
"	CXXXII & CXXXI	39	54'02	10	23'15		
CXXXIV	CXXXII & CXXXI	34	26'88	10	5'95		
"	CXXXI & CXXXIII	32	19'98	10	10'28		
"	CXXXIII & CXXXV	34	23'14	10	16'98		
"	CXXXV & CXXXVI	31	21'84	10	9'82		
CXXXV	CXXXVIII & CXXXVII	36	14'92	10	4'92		
"	CXXXVII & CXXXVI	39	26'90	10	7'48		
"	CXXXVI & CXXXIV	34	23'04	10	11'74		
"	CXXXIV & CXXXIII	35	51'84	10	8'58		
CXXXVI	CXXXIV & CXXXIII	35	36'87	10	19'23		
"	CXXXIII & CXXXV	34	34'03	10	5'20		
"	CXXXV & CXXXVII	39	25'51	10	9'51		
"	CXXXVII & CXXXIX	38	31'23	10	5'83		
CXXXVII	CXXXVI & CXXXV	39	58'75	10	7'48		
"	CXXXV & CXXXVIII	36	30'00	10	15'99		
"	CXXXVIII & CXLI	38	30'11	10	3'67		
"	CXLI & CXL	39	43'15	10	8'65		
"	CXL & CXXXIX	36	30'52	10	8'46		
"	CXXXIX & CXXXVI	34	36'01	10	2'65		
CXXXVIII	CXLII & CXLI	33	23'02	10	3'14		} Troughton's 24" No. 2.
"	CXLI & CXXXVII	33	23'17	10	3'53		
"	CXXXVII & CXXXV	37	22'30	10	8'06		
CXXXIX	CXXXVI & CXXXVII	36	27'51	10	6'16		} Troughton's 36".
"	CXXXVII & CXL	36	23'40	10	5'54		
CXL	CXXXIX & CXXXVII	47	40'80	10	6'45		

*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
CXL	CXXXVII & CXLI	36	27.63	10	3.62	Troughton's 36".
"	CXLI & CXLIV	30	5.56	10	4.22	
CXLI	CXLII & CXLIII	33	10.86	10	4.78	
"	CXLIII & CXLIV	39	18.44	10	6.59	
"	CXLIV & CXL	35	10.80	10	9.44	
"	CXL & CXXXVII	35	11.32	10	6.25	
"	CXXXVII & CXXXVIII	33	16.02	10	6.74	
"	CXXXVIII & CXLII	34	11.78	10	4.35	Troughton's 24" No. 2.
CXLII	CXLIII & CXLI	39	23.59	10	4.28	
"	CXLI & CXXXVIII	41	35.88	10	4.61	Troughton's 36".
CXLIII	CXLVI & CXLV	33	12.15	10	5.73	
"	CXLV & CXLIV	31	9.67	10	4.53	Waugh's 24" No. 1.
"	CXLVI & CXLV	20	6.56	10	16.24	
"	CXLV & CXLIV	20	2.74	10	21.69	Troughton's 24" No. 2.
"	CXLIV & CXLI	32	5.20	10	3.24	
"	CXLI & CXLII	38	17.18	10	4.82	Troughton 24" No. 2.
CXLIV	CXL & CXLI	34	14.22	10	5.52	
"	CXLI & CXLIII	35	11.99	10	6.45	Waugh's 24" No. 1.
"	CXLIII & CXLV	21	10.04	10	7.78	
"	CXLV & CXLVII	21	5.49	10	7.71	Troughton's 36".
"	CXLIII & CXLV	39	25.87	10	4.98	
"	CXLV & CXLVII	33	9.03	10	4.22	Waugh's 24" No. 1.
CXLV	CXLVIII & CXLVII	20	5.74	10	19.35	
"	CXLVII & CXLIV	20	5.32	10	8.95	Troughton's 36".
"	CXLIV & CXLIII	20	4.32	10	16.06	
"	CXLIII & CXLVI	20	4.56	10	27.66	Waugh's 24" No. 1.
"	CXLVI & CXLVIII	20	7.58	10	28.38	
"	CXLVIII & CXLVII	43	40.85	10	6.32	Troughton's 36".
"	CXLVII & CXLIV	36	23.15	10	4.31	
"	CXLIV & CXLIII	36	14.61	10	10.17	Waugh's 24" No. 1.
"	CXLIII & CXLVI	37	23.04	10	2.59	
"	CXLVI & CXLVIII	39	25.20	10	7.26	Troughton's 36".
CXLVI	(XVII) & CXLVIII	20	3.18	10	6.00	
"	CXLVIII & CXLV	22	10.86	10	17.31	Waugh's 24" No. 1.

NOTE.—(XVII) appertains to base-line figures.



*Sums of Squares of Apparent Errors of Single Observations, and of Apparent Errors of Single Zeros.*

Station of Observation.	Observed Angle.	Number of Observations.	Sum of Squares of Errors of single Observations.	Number of Zeros.	Sum of Squares of Errors of single Zeros.	REMARKS.
CXLVI	CXLV & CXLIII	22	9'12	10	9'32	Waugh's 24" No. 1.
"	(XVII) & CXLVIII	31	13'41	10	2'76	
"	CXLVIII & CXLV	36	15'18	10	4'45	
"	CXLV & CXLIII	43	30'18	10	8'38	Troughton's 36".
CXLVII	CXLIV & CXLV	20	5'72	10	10'94	
"	CXLV & CXLVIII	20	5'96	10	11'73	Waugh's 24" No. 1.
"	CXLVIII & CXLIX	20	5'52	10	5'46	
"	CXLIV & CXLV	41	30'02	10	3'42	Troughton's 36".
"	CXLV & CXLVIII	44	37'81	10	13'18	
"	CXLVIII & CXLIX	30	11'60	10	3'33	
CXLVIII	(XIX) & CXLIX	21	12'29	10	19'41	Waugh's 24" No. 1.
"	CXLIX & CXLVII	23	17'02	10	14'11	
"	CXLVII & CXLV	21	10'07	10	13'34	
"	CXLV & CXLVI	21	8'56	10	12'13	
"	CXLVI & (XVII)	20	12'60	10	8'94	
"	(XVII) & (XIX)	20	11'72	10	10'99	
"	(XIX) & CXLIX	35	17'36	10	2'84	
"	CXLIX & CXLVII	35	18'32	10	8'36	
"	CXLVII & CXLV	35	13'53	10	5'07	
"	CXLV & CXLVI	31	10'70	10	4'12	
"	CXLVI & (XVII)	35	20'44	10	7'08	
"	(XVII) & (XIX)	34	12'91	10	4'92	
CXLIX	CXLVII & CXLVIII	20	2'46	10	6'11	Waugh's 24" No. 1.
"	CXLVIII & (XIX)	20	4'94	10	11'56	
"	CXLVII & CXLVIII	39	33'68	10	4'37	Troughton's 36".
"	CXLVIII & (XIX)	36	22'07	10	5'53	
(XVII)	(XIX) & CXLVIII	20	16'66	10	15'84	Waugh's 24" No. 1.
"	CXLVIII & CXLVI	20	8'38	10	14'60	
"	(XIX) & CXLVIII	34	17'48	10	8'59	Troughton's 36".
"	CXLVIII & CXLVI	31	12'25	10	4'52	
(XIX)	CXLIX & CXLVIII	21	7'68	10	13'07	Waugh's 24" No. 1.
"	CXLVIII & (XVII)	23	10'18	10	6'36	
"	CXLIX & CXLVIII	37	31'64	10	9'72	
"	CXLVIII & (XVII)	38	34'20	10	9'65	Troughton's 36".

NOTE.—(XVII) and (XIX) appertain to base-line figures.

From the preceding data of the sums of the squares of the apparent errors, in the measurement of each angle, we may ascertain the *e. m. s.* (error of mean square) of observation of a single measure of an angle, and the *e. m. s. of graduation and observation*, of the mean of the measures on a single zero, for each group of angles measured with the same instrument, by the same observer, and under similar circumstances.

The instruments employed were Troughton's 36" Theodolite, Colonel Waugh's 24" Theodolite No. 1, and Troughton's 24" Theodolite No. 2. With the first 409 angles were measured, with the second 209, with the third 9 only. The azimuthal circles of all three instruments were read by 5 microscopes, and observations were taken on 5 pairs of zeros (*face right* and *face left*), giving circle readings at 7° 12' apart.

$$\left. \begin{array}{l} \text{The } e. m. s. \text{ of observation of a single measure} \\ \text{of an angle} \end{array} \right\} = \sqrt{\frac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$$

$$\left. \begin{array}{l} \text{The } e. m. s. \text{ of graduation and observation of} \\ \text{the mean of the measures on a single zero} \end{array} \right\} = \sqrt{\frac{\text{Sum of squares of apparent errors of zero.}}{\text{No. of angles} \times (\text{No. of changes of zero} - 1).}}$$

Group.	Instrument and Observer.	Position of stations.	Intervals between microscope readings of circle.	Number of				<i>e. m. s.</i> of observation of a single measure.	<i>e. m. s.</i> of graduation and observation of a single zero.
				Measures on each zero (average).	Angles.	Single measures.	Single zeros.		
I	{ Lieut. Tennant, 36" theodolite Troughton's.	Hills,	7° 12'	3.16	66	2081	660	$\left\{ \frac{826.38}{2081-660} \right\}^{\frac{1}{2}} = \pm 0''.763$	$\left\{ \frac{451.91}{660-66} \right\}^{\frac{1}{2}} = \pm 0''.872$
II	{ ditto	Plains,	7° 12'	3.20	50	1599	500	$\left\{ \frac{920.44}{1599-500} \right\}^{\frac{1}{2}} = \pm 0''.915$	$\left\{ \frac{372.79}{500-50} \right\}^{\frac{1}{2}} = \pm 0''.910$
III	{ Mr. Keelan, 24" theodolite No. 1 Waugh's.	Hills,	7° 12'	3.40	2	68	20	$\left\{ \frac{39.58}{68-20} \right\}^{\frac{1}{2}} = \pm 0''.908$	$\left\{ \frac{18.13}{20-2} \right\}^{\frac{1}{2}} = \pm 1''.004$
IV	{ ditto	Plains,	7° 12'	3.19	180	5738	1800	$\left\{ \frac{3201.29}{5738-1800} \right\}^{\frac{1}{2}} = \pm 0''.902$	$\left\{ \frac{1453.68}{1800-180} \right\}^{\frac{1}{2}} = \pm 0''.949$
V	{ Various observers, 36" theodolite Troughton's.	Hills,	7° 12'	3.48	28	975	280	$\left\{ \frac{483.39}{975-280} \right\}^{\frac{1}{2}} = \pm 0''.834$	$\left\{ \frac{167.88}{280-28} \right\}^{\frac{1}{2}} = \pm 0''.816$
VI	{ ditto	Plains,	7° 12'	3.50	166	5815	1660	$\left\{ \frac{6173.05}{5815-1660} \right\}^{\frac{1}{2}} = \pm 1''.219$	$\left\{ \frac{1268.24}{1660-166} \right\}^{\frac{1}{2}} = \pm 0''.921$
VII	{ Lieut. Basevi, 36" theodolite Troughton's.	do.	7° 12'	3.42	99	3388	990	$\left\{ \frac{3211.05}{3388-990} \right\}^{\frac{1}{2}} = \pm 1''.157$	$\left\{ \frac{966.53}{990-99} \right\}^{\frac{1}{2}} = \pm 1''.042$
VIII	{ Various observers, 24" theodolite No. 2 Troughton's.	Hills,	7° 12'	3.58	9	322	90	$\left\{ \frac{176.55}{322-90} \right\}^{\frac{1}{2}} = \pm 0''.872$	$\left\{ \frac{43.65}{90-9} \right\}^{\frac{1}{2}} = \pm 0''.734$
IX	{ Mr. Logan, 24" theodolite No. 1 Waugh's.	do.	7° 12'	2.08	20	416	200	$\left\{ \frac{180.35}{416-200} \right\}^{\frac{1}{2}} = \pm 0''.914$	$\left\{ \frac{242.97}{200-20} \right\}^{\frac{1}{2}} = \pm 1''.162$

Group.	Instrument and Observer.	Position of stations.	Intervals between microscope readings of circle.	Number of				<i>e. m. s.</i> of observation of a single measure.	<i>e. m. s.</i> of graduation and observation of a single zero.
				Measures on each zero (average).	Angles.	Single measures.	Single zeros.		
X	{ Mr. Logan, 24" theodolite No. 1 Waugh's.	Plains.	7° 12'	2.00	7	140	70	$\left\{ \frac{34.92}{140-70} \right\}^{\frac{1}{2}} = \pm 0''.706$	$\left\{ \frac{118.07}{70-7} \right\}^{\frac{1}{2}} = \pm 1''.369$
I & V	{ 36" theodolite Troughton's.	Hills,	7° 12'	3.25	94	3056	940	$\left\{ \frac{1309.77}{3056-940} \right\}^{\frac{1}{2}} = \pm 0''.787$	$\left\{ \frac{619.79}{940-94} \right\}^{\frac{1}{2}} = \pm 0''.856$
II, VI, & VII	ditto	Plains,	7° 12'	3.43	315	10802	3150	$\left\{ \frac{10304.54}{10802-3150} \right\}^{\frac{1}{2}} = \pm 1''.160$	$\left\{ \frac{2607.56}{3150-315} \right\}^{\frac{1}{2}} = \pm 0''.959$
III & IX	{ 24" theodolite No. 1 Waugh's.	Hills,	7° 12'	2.20	22	484	220	$\left\{ \frac{219.93}{484-220} \right\}^{\frac{1}{2}} = \pm 0''.913$	$\left\{ \frac{261.10}{220-22} \right\}^{\frac{1}{2}} = \pm 1''.148$
IV & X	ditto	Plains,	7° 12'	3.14	187	5878	1870	$\left\{ \frac{3236.21}{5878-1870} \right\}^{\frac{1}{2}} = \pm 0''.899$	$\left\{ \frac{1576.75}{1870-187} \right\}^{\frac{1}{2}} = \pm 0''.968$



**PRINCIPAL TRIANGULATION. REDUCTION OF FIGURES.**

**GREAT INDUS SERIES.**

Figure No. 49.

Observed Angles					Equations to be satisfied							Factor									
No.	Value			Reciprocal Weight	$x_1$	$x_2$	$x_3$	$x_4$	$x_5$	$x_6$	$x_7$	$x_8$	$x_9$	$x_{10}$	$x_{11}$	$x_{12}$	$x_{13}$	$x_{14}$	$x_{15}$		
	°	'	"																		
1	74	27	4.38	.07																	
2	55	39	54.19	.03																	
3	67	34	47.32	.18																	
4	59	16	4.00	.22																	
5	66	34	39.17	.14																	
6	79	49	20.23	.14																	
7	86	45	9.22	.16																	
8	75	59	0.84	.09																	
9	37	58	7.71	.07																	
10	37	34	57.76	.06																	
11	63	50	15.42	.11																	
12	54	29	6.31	.11																	
13	44	44	54.57	.10																	
14	36	20	25.14	.10																	
15	58	56	17.22	.08																	
					Equations to be satisfied																
					Equations between the factors																
					Co-efficients of																
					No. of e	Value of e															
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$									
					1	-1.10							+0.18	-0.070							
					2	-1.62							+0.22	-0.078							
					3	+1.27							+0.14	+0.030							
					4	-0.17							+0.14	+0.082							
					5	+0.69							+0.16	+0.058							
					6	-0.06							+0.84								
					7	-2.42								+0.639							
Values of the Factors																					
Factor	Symbolical							Numerical	Logarithmic												
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$														
$\lambda_1 =$	+3.990	+0.818	+0.556	+0.468	+0.803	-1.391	+0.376	-5.360	0.7291648												
$\lambda_2 =$		+3.214	+0.533	+0.455	+0.774	-1.327	+0.326	-5.682	0.7545012												
$\lambda_3 =$			+3.490	+0.458	+0.710	-1.050	-0.162	+3.824	0.5825179												
$\lambda_4 =$				+3.350	+0.730	-0.992	-0.411	+0.318	1.5024271												
$\lambda_5 =$				*	+5.110	-1.586	-0.410	+3.254	0.5124175												
$\lambda_6 =$						+2.475	+0.009	+1.250	0.0969100												
$\lambda_7 =$							+1.742	-5.577	0.7464006												
Adopted angular errors in seconds																					
$x_1 =$	-0.49	$x_4 =$	-0.98	$x_7 =$	+0.72	$x_{10} =$	-0.24	$x_{13} =$	0.00												
$x_2 =$	+0.21	$x_5 =$	+0.71	$x_8 =$	-0.64	$x_{11} =$	+0.35	$x_{14} =$	-0.74												
$x_3 =$	-0.74	$x_6 =$	+0.22	$x_9 =$	+0.13	$x_{12} =$	-0.02	$x_{15} =$	+0.58												
$[wx^2] = 35.57$																					

Figure No. 50.

Observed Angles				Equations to be satisfied											Factor	
No.	Value	Reciprocal Weight		$x_2$	$x_3$	$x_5$	...	...	...	...	...	...	...	...	$= e_1 = -2.00,$	$\lambda_1$
1	53 43 28.63	.15		$x_1$	$+ x_6$	$+ x_{12}$	...	...	...	...	...	...	...	...	$= e_2 = +.18,$	$\lambda_2$
2	57 27 43.19	.27		$x_4$	$+ x_9$	$+ x_{13}$	...	...	...	...	...	...	...	...	$= e_3 = +.13,$	$\lambda_3$
3	51 46 11.71	.10		$x_7$	$+ x_{11}$	$+ x_{17}$	...	...	...	...	...	...	...	...	$= e_4 = -.48,$	$\lambda_4$
4	57 49 36.55	.13		$x_{10}$	$+ x_{18}$	$+ x_{22}$	...	...	...	...	...	...	...	...	$= e_5 = +1.04,$	$\lambda_5$
5	70 46 4.42	.04		$x_{19}$	$+ x_{21}$	$+ x_{24}$	...	...	...	...	...	...	...	...	$= e_6 = -.09,$	$\lambda_6$
6	82 9 54.90	.11		$x_8$	$+ x_{14}$	$+ x_{16}$	...	...	...	...	...	...	...	...	$= e_7 = +.97,$	$\lambda_7$
7	78 30 38.05	.09		$x_{15}$	$+ x_{20}$	$+ x_{23}$	...	...	...	...	...	...	...	...	$= e_8 = +.68,$	$\lambda_8$
8	52 59 46.09	.06		$x_5$	$+ x_6$	$+ x_7$	$+ x_8$	$+ x_9$	...	...	...	...	...	...	$= e_9 = -.10,$	$\lambda_9$
9	75 33 36.44	.06		$x_{16}$	$+ x_{17}$	$+ x_{18}$	$+ x_{19}$	$+ x_{20}$	...	...	...	...	...	...	$= e_{10} = +.17,$	$\lambda_{10}$
10	55 56 2.18	.07		$.73x_1$	$-.64x_2$	$+.96x_{11}$	$-1.03x_{12}$	$+.26x_{16}$	$-.69x_{17}$	$+.95x_{13}$	$-.79x_{14}$	$+.79x_3$	$-.63x_4$	$= e_{11} = +.57,$	$\lambda_{11}$	
11	46 5 23.49	.08		$.20x_7$	$-.75x_8$	$+.68x_{10}$	$-.96x_{11}$	$+.92x_{21}$	$-.77x_{22}$	$+1.09x_{23}$	$-.65x_{24}$	$+.79x_{14}$	$-.68x_{15}$	$= e_{12} = +.19,$	$\lambda_{12}$	
12	44 6 38.15	.14		Equations between the factors												
13	46 36 48.84	.09		Co-efficients of												
14	51 40 39.86	.04	No. of e	Value of e												
15	55 49 56.50	.10		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$	
16	75 19 36.34	.08	1													
17	55 23 59.48	.15	2	+.41												
18	71 44 52.50	.04	3		+.40											
19	75 46 51.68	.10	4			+.28										
20	81 44 40.17	.14	5				+.32									
21	47 17 27.26	.14	6					+.34								
22	52 19 8.83	.23	7						+.32							
23	42 25 25.70	.07	8							+.18						
24	56 55 43.28	.08	9								+.18					
			10									+.36				
			11										+.51			
			12											+.711		
															+.588	
Values of the Factors																
Factor	Symbolical												Numerical	Logarithmic		
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$	$e_{10}$	$e_{11}$	$e_{12}$				
$\lambda_1 =$	$+2.5617$	$+ .1428$	$+ .0821$	$+ .1672$	$+ .0291$	$- .0109$	$+ .1711$	$+ .0068$	$- .4072$	$- .0191$	$+ .3616$	$+ .0705$	$-4.7082$	$0.6728544$		
$\lambda_2 =$		$2.8153$	$.2332$	$.4288$	$.0362$	$.0613$	$.4739$	$.0971$	$1.0991$	$.2166$	$.1543$	$.0276$	$+ .7703$	$1.8866740$		
$\lambda_3 =$			$3.7536$	$.3281$	$.0215$	$.0606$	$.3689$	$.0868$	$.8495$	$.1922$	$-.0039$	$-.0030$	$.6912$	$1.8395679$		
$\lambda_4 =$				$4.5344$	$.3897$	$.4881$	$1.3922$	$.8461$	$1.5373$	$1.8988$	$+ .0737$	$+ .4376$	$- .1472$	$1.1677787$		
$\lambda_5 =$					$3.2894$	$-.0481$	$.2939$	$.1813$	$.1057$	$.4456$	$.0812$	$.7798$	$+ 3.7284$	$0.5715205$		
$\lambda_6 =$						$+ 3.5775$	$.5317$	$.5048$	$.2731$	$1.0897$	$- .1640$	$- .4654$	$-.0469$	$2.6715199$		
$\lambda_7 =$							$6.9694$	$.8329$	$1.7196$	$1.8560$	$+ .0151$	$+ .2010$	$+ 6.6112$	$0.8202782$		
$\lambda_8 =$								$3.9484$	$.3967$	$1.5991$	$- .1391$	$- .0183$	$2.9304$	$0.4669202$		
$\lambda_9 =$									$+ 3.9708$	$.8787$	$.0846$	$.0063$	$-1.0775$	$0.0324213$		
$\lambda_{10} =$										$3.5456$	$.2907$	$.0756$	$1.7022$	$0.2310055$		
$\lambda_{11} =$											$1.5410$	$+ .3044$	$+ .2824$	$1.4508186$		
$\lambda_{12} =$												$2.0324$	$1.2369$	$0.0923315$		
Adopted angular errors in seconds																
$x_1 = +.14$	$x_6 = -.03$	$x_{11} = -.08$	$x_{16} = +.40$	$x_{21} = +.15$												
$x_2 = -1.32$	$x_7 = -.09$	$x_{12} = +.07$	$x_{17} = -.31$	$x_{22} = +.64$												
$x_3 = -.45$	$x_8 = +.27$	$x_{13} = +.08$	$x_{18} = +.08$	$x_{23} = +.30$												
$x_4 = +.07$	$x_9 = -.02$	$x_{14} = +.30$	$x_{19} = -.17$	$x_{24} = -.07$												
$x_5 = -.23$	$x_{10} = +.32$	$x_{15} = +.21$	$x_{20} = +.17$													
$[wx^2] = 22.22$																

Figure No. 51.

Observed Angles				Equations to be satisfied				Factor		
No.	Value			Reciprocal Weight						
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = +0'23,$	$\lambda_1$
1	36	18	47'30"	.10	$x_5$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = +0'82,$	$\lambda_2$
2	51	14	30'33"	.05	$x_1$	$+x_2$	$+x_3$	$+x_4$	} $=e_3 = +0'01,$	$\lambda_3$
3	37	18	32'81"	.08	$+x_5$	$+x_6$	$+x_7$	$+x_8$		
4	55	8	12'72"	.12	$1'36 x_1$	$-.80 x_2$	$+1'31 x_3$	$-.70 x_4$	} $=e_4 = +0'05,$	$\lambda_4$
5	53	9	21'28"	.08	$+ .75 x_5$	$-1'46 x_6$	$+ .75 x_7$	$-1'22 x_8$		
6	34	23	55'42"	.06						
7	53	1	56'88"	.08						
8	39	24	48'65"	.06						

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	+ '23	+ '29		+ '01	+ '124	$\lambda_1 =$	+ 3'7238	+ '0623	+ '0127	- '6447	+ '876	$\bar{1}^{\cdot}9425041$
2	+ '82		+ '34	+ '06	+ '034	$\lambda_2 =$		+ 3'0015	- '2721	- '1235	+ 2'468	0'3923452
3	+ '01		*	+ '63	+ '076	$\lambda_3 =$		*	+ 1'6324	- '1617	- '210	$\bar{1}^{\cdot}3222193$
4	+ '05				+ '721	$\lambda_4 =$				+ 1'5209	- '175	$\bar{1}^{\cdot}2430380$

Adopted angular errors in seconds

$x_1 = +.05$	$x_5 = -.10$
$x_2 = +.04$	$x_6 = -.05$
$x_3 = +.16$	$x_7 = -.22$
$x_4 = +.29$	$x_8 = -.15$

$[wx^2] = 2'22$



Figure No. 52.

Observed Angles					Equations to be satisfied					Factor	
No.	Value			Reciprocal Weight							
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$= e_1 = +$	"	$\lambda_1$
1	64	40	28.05	.04	$x_3$	$+x_4$	$-x_7$	$-x_8$	$= e_2 = +$	.56	$\lambda_2$
2	51	32	24.84	.04	$x_1$	$+x_2$	$+x_3$	$+x_4$	} $= e_3 = +$	1.09	$\lambda_3$
3	31	20	36.67	.09	$+x_5$	$+x_6$	$+x_7$	$+x_8$			
4	32	26	34.95	.11	$.47x_1$	$-.79x_2$	$+1.64x_3$	$-1.57x_4$	} $= e_4 = +$	0.14	$\lambda_4$
5	28	50	26.46	.06	$+1.82x_5$	$-.05x_6$	$+1.09x_7$	$-2.55x_8$			
6	87	22	25.54	.07							
7	42	24	31.96	.05							
8	21	22	37.98	.04							

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	$+ .07$	$+ .21$		$- .05$	$-.118$	$\lambda_1 =$	$+5.2151$	$-.2536$	$+ .5545$	$+ .5716$	$+ .907$	$\bar{1}.9576073$
2	$+ .56$		$+ .29$	$+ .11$	$+ .022$	$\lambda_2 =$		$+3.7783$	$-.8529$	$-.0898$	$+1.157$	$0.0633334$
3	$+1.09$		*	$+ .50$	$+ .020$	$\lambda_3 =$		*	$+2.2413$	$+ .0369$	$+2.009$	$0.3029799$
4	$+ .14$				$+1.067$	$\lambda_4 =$				$+1.0016$	$+ .170$	$\bar{1}.2304489$

**Adopted angular errors in seconds**

$x_1 = + .12$	$x_5 = + .08$
$x_2 = + .11$	$x_6 = + .08$
$x_3 = + .31$	$x_7 = + .05$
$x_4 = + .32$	$x_8 = + .02$

$[wx^2] = 2.92$

Figure No. 53.

Observed Angles				Equations to be satisfied				Factor		
No.	Value			Reciprocal Weight						
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = -''45,$	$\lambda_1$
1	35	36	12'41	.20	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = -''07,$	$\lambda_2$
2	59	55	17'11	.14	$x_1$	$+x_2$	$+x_3$	$+x_4$	} $=e_3 = -''66,$	$\lambda_3$
3	48	41	40'32	.10	$+x_5$	$+x_6$	$+x_7$	$+x_8$		
4	35	46	51'15	.03	$1.40x_1$	$-.58x_2$	$+.88x_3$	$-1.39x_4$	} $=e_4 = -1.28,$	$\lambda_4$
5	40	54	37'17	.05	$+1.15x_5$	$-.71x_6$	$+.79x_7$	$-1.54x_8$		
6	54	36	52'71	.16						
7	51	32	26'76	.03						
8	32	56	4'93	.14						

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-''45	+ .55		+ .13	+ .255	$\lambda_1 =$	+ 2.1778	+ .4459	- .3144	- .6150	- .016	2.2041200
2	- .07		+ .30	- .04	+ .238	$\lambda_2 =$		+ 4.1626	+ .1240	- 1.0250	+ .739	1.8686444
3	- .66		*	+ .85	- .003	$\lambda_3 =$		*	+ 1.2306	+ .0506	- .745	1.8721563
4	- 1.28				+ 1.074	$\lambda_4 =$				+ 1.3006	- 1.350	0.1303338

Adopted angular errors in seconds.

$x_1 = - .51$	$x_5 = - .10$
$x_2 = - .01$	$x_6 = + .03$
$x_3 = - .12$	$x_7 = - .08$
$x_4 = + .05$	$x_8 = + .08$

$[wx^2] = 2.19$

Figure No. 54.

Observed Angles				Equations to be satisfied				Factor		
No.	Value			Reciprocal Weight						
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = + \cdot 01,$	$\lambda_1$
1	33	27	33'68	·10	$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = - \cdot 36,$	$\lambda_2$
2	60	42	7'90	·04	$x_1$	$+x_2$	$+x_3$	$+x_4$	} $=e_3 = - \cdot 23,$	$\lambda_3$
3	54	6	56'46	·05	$+x_5$	$+x_6$	$+x_7$	$+x_8$		
4	31	43	23'02	·14	$1\cdot51 x_1$	$-\cdot56 x_2$	$+\cdot72 x_3$	$-1\cdot62 x_4$	} $=e_4 = + \cdot 43,$	$\lambda_4$
5	32	54	32'04	·10	$+1\cdot55 x_5$	$-\cdot55 x_6$	$+\cdot68 x_7$	$-1\cdot73 x_8$		
6	61	15	9'48	·05						
7	55	51	44'55	·15						
8	29	58	35'27	·04						

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	$+ \cdot 01$	$+ \cdot 29$		$- \cdot 01$	$+ \cdot 002$	$\lambda_1 =$	$+3\cdot4502$	$- \cdot 0075$	$+ \cdot 0534$	$- \cdot 0128$	$+ \cdot 019$	$\bar{2}\cdot2787536$
2	$- \cdot 36$		$+ \cdot 38$		$- \cdot 224$	$\lambda_2 =$		$+3\cdot0047$	$- \cdot 0925$	$+ \cdot 6334$	$- \cdot 788$	$\bar{1}\cdot8965262$
3	$- \cdot 23$		*	$+ \cdot 67$	$+ \cdot 098$	$\lambda_3 =$		*	$+1\cdot5163$	$- \cdot 1574$	$- \cdot 381$	$\bar{1}\cdot5809250$
4	$+ \cdot 43$				$+1\cdot077$	$\lambda_4 =$				$+1\cdot0745$	$+ \cdot 270$	$\bar{1}\cdot4513638$

Adopted angular errors in seconds.

$x_1 = \cdot 00$	$x_5 = \cdot 00$
$x_2 = - \cdot 02$	$x_6 = - \cdot 03$
$x_3 = - \cdot 05$	$x_7 = + \cdot 09$
$x_4 = - \cdot 22$	$x_8 = \cdot 00$

$[wx^2] = 0\cdot49$

PRINCIPAL TRIANGULATION—REDUCTION OF FIGURES.

Figure No. 55.

Observed Angles					Equations to be satisfied										Factor		
No.	Value			Reciprocal Weight													
	o	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$= e_1 = -$	$.70,$	$\lambda_1$						
1	38	22	49'93	.09	$x_3$	$+x_4$	$-x_7$	$-x_8$	$= e_2 = -$	$.64,$	$\lambda_2$						
2	46	33	54'42	.11	$x_1$	$+x_2$	$+x_3$	$+x_4$	}	$= e_3 = +$	$.50,$	$\lambda_3$					
3	46	8	3'97	.14	$+x_5$	$+x_6$	$+x_7$	$+x_8$									
4	48	55	12'35	.03	$1.26x_1$	$-.95x_2$	$+.96x_3$	$-.87x_4$	}	$= e_4 = -$	$.10,$	$\lambda_4$					
5	37	21	3'95	.08	$+1.31x_5$	$-.91x_6$	$+.59x_7$	$-1.41x_8$									
6	47	35	40'89	.04													
7	59	37	30'51	.12													
8	35	25	46'43	.11													

Equations between the factors					Values of the Factors							
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	$-.70$	$+.32$		$+.08$	$-.061$	$\lambda_1 =$	$+3.3009$	$-.2338$	$-.4355$	$+.3510$	$-2.414$	$0.3827373$
2	$-.64$		$+.40$	$-.06$	$+.192$	$\lambda_2 =$		$+2.9102$	$+.3722$	$-.7384$	$-1.439$	$0.1580608$
3	$+.50$		*	$+.72$	$+.101$	$\lambda_3 =$		*	$+1.5107$	$-.3027$	$+.852$	$1.9304396$
4	$-.10$				$+.826$	$\lambda_4 =$				$+1.4432$	$-.068$	$2.8325089$

Adopted angular errors in seconds.

$x_1 = -.15$	$x_5 = +.25$
$x_2 = -.17$	$x_6 = +.13$
$x_3 = -.09$	$x_7 = +.27$
$x_4 = -.01$	$x_8 = +.27$

$[wx^2] = 3.05$

Figure No. 56.

Observed Angles					Equations to be satisfied					Factor	
No.	Value			Reciprocal Weight					"		
	o	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$= e_1 = -\cdot44,$	$\lambda_1$	
1	54	38	46.10	.08	$x_3$	$+x_4$	$-x_7$	$-x_8$	$= e_2 = -\cdot25,$	$\lambda_2$	
2	44	25	36.11	.10	$x_1$	$+x_2$	$+x_3$	$+x_4$	$= e_3 = -1.39,$	$\lambda_3$	
3	41	43	33.73	.21	$+x_5$	$+x_6$	$+x_7$	$+x_8$			
4	39	12	4.13	.10	$.71 x_1$	$-1.02 x_2$	$+1.12 x_3$	$-1.23 x_4$	$= e_4 = -\cdot24,$	$\lambda_4$	
5	33	53	23.76	.03	$+1.49 x_5$	$-.46 x_6$	$+ .92 x_7$	$-1.50 x_8$			
6	65	10	58.78	.06							
7	47	17	36.18	.04							
8	33	38	1.64	.04							

Equations between the factors					Values of the Factors							
N. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	$-\cdot44$	$+\cdot27$		$+\cdot09$	$-\cdot062$	$\lambda_1 =$	$+4.0044$	$+ \cdot2845$	$- \cdot6755$	$+ \cdot3295$	$- \cdot974$	$\bar{1}.9885590$
2	$-\cdot25$		$+\cdot39$	$+\cdot23$	$+\cdot135$	$\lambda_2 =$		$+3.4365$	$-1.1912$	$- \cdot4902$	$+ \cdot791$	$\bar{1}.8981765$
3	$-1.39$		*	$+\cdot66$	$+\cdot061$	$\lambda_3 =$		*	$+2.0228$	$- \cdot0059$	$-2.217$	$0.3457657$
4	$-\cdot24$				$+\cdot762$	$\lambda_4 =$				$+1.4264$	$- \cdot357$	$\bar{1}.5526682$

Adopted angular errors in seconds

$x_1 = -\cdot29$	$x_5 = -\cdot06$
$x_2 = -\cdot26$	$x_6 = -\cdot05$
$x_3 = -\cdot40$	$x_7 = -\cdot15$
$x_4 = -\cdot09$	$x_8 = -\cdot09$

$[wx^2] = 3.41$

Figure No. 57.

Observed Angles				Equations to be satisfied							Factor	
No.	Value			Reciprocal Weight	$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = +.29,$	$\lambda_1$		
	o	'	"		$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = +.05,$	$\lambda_2$		
1	31	42	16.12	.11	$x_1$	$+x_2$	$+x_3$	$+x_4$	$=e_3 = +.04,$	$\lambda_3$		
2	64	16	55.78	.03	$+x_5$	$+x_6$	$+x_7$	$+x_8$				
3	54	17	15.52	.05	$1.62x_1$	$-.48x_2$	$+.72x_3$	$-1.75x_4$	$=e_4 = -.24,$	$\lambda_4$		
4	29	43	33.49	.07	$+1.35x_5$	$-.59x_6$	$+.77x_7$	$-1.63x_8$				
5	36	26	17.55	.04								
6	59	32	54.08	.07								
7	52	31	35.04	.07								
8	31	29	13.99	.11								

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	+.29	+.25		+.03	+.151	$\lambda_1 =$	+4.4621	+ .0330	- .2848	- .7085	+1.454	0.1625644
2	+.05		+.30	-.06	+.038	$\lambda_2 =$		+3.4221	+ .3633	- .1266	+ .227	1.3560259
3	+.04		*	+.55	-.035	$\lambda_3 =$		*	+1.8796	+ .0983	- .012	2.0791812
4	-.24				+.967	$\lambda_4 =$				+1.1535	- .485	1.6857417

Adopted angular errors in seconds

$x_1 = +.08$	$x_5 = -.09$
$x_2 = +.05$	$x_6 = -.08$
$x_3 = -.01$	$x_7 = -.04$
$x_4 = +.08$	$x_8 = +.06$

$[wx^2] = 0.55$

Figure No. 58.

Observed Angles				Equations to be satisfied								Factor		
No.	Value			Reciprocal Weight										
	°	'	"		$x_2$	$+x_3$	$+x_5$	$=e_1 = -$	$.52,$	$\lambda_1$				
					$x_1$	$+x_6$	$+x_{12}$	$=e_2 = -$	$.35,$	$\lambda_2$				
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = +$	$.29,$	$\lambda_3$				
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = -$	$.08,$	$\lambda_4$				
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = -$	$.10,$	$\lambda_5$				
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = -$	$.99,$	$\lambda_6$				
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$=e_7 = -$	$.33,$	$\lambda_7$	
1	49	30	41.42	.04	$\left. \begin{aligned} &.52x_3 - .35x_2 + .85x_1 - .35x_{12} + 1.08x_{11} - 1.05x_{16} \\ &+ .39x_{15} - .82x_{18} + .55x_{17} - .40x_{14} + .24x_{13} - .69x_4 \end{aligned} \right\} = e_8 = - .86, \lambda_8$									
2	70	34	37.54	.08										
3	62	28	26.31	.08										
4	55	30	21.28	.13										
5	46	56	56.51	.06										
6	59	59	54.82	.11										
7	93	26	3.72	.08										
8	60	49	27.06	.06										
Equations between the factors														
				No. of e	Value of e	Co-efficients of								
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	
10	48	9	39.76	.09										
11	42	55	14.73	.03										
12	70	29	24.20	.05										
13	76	19	58.78	.15										
14	68	16	40.58	.09	1	-.52						+.06	+.014	
15	68	29	18.87	.11	2	-.35						+.11	+.016	
16	43	38	42.56	.05	3	+.29						+.08	-.021	
17	61	5	22.27	.10	4	-.08						+.06	-.047	
18	50	41	14.74	.11	5	-.10						+.18	+.019	
					6	-.99						+.09	-.054	
					7	-.33						+.58		
					8	-.86							+.364	
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+4.773	+ .450	+ .377	+ .143	+ .394	+ .170	- .795	- .159	-2.350	0.3710679				
$\lambda_2 =$		+5.898	+ .780	+ .314	+ .790	+ .365	-1.607	- .178	-1.854	0.2681097				
$\lambda_3 =$			+7.047	+ .390	+ .698	+ .423	-1.481	+ .435	+1.169	0.0678145				
$\lambda_4 =$				+3.796	+ .288	+ .232	- .646	+ .514	- .862	1.9355073				
$\lambda_5 =$					+3.399	+ .331	-1.422	- .099	- .415	1.6180481				
$\lambda_6 =$				*		+2.946	- .728	+ .452	-3.210	0.5065050				
$\lambda_7 =$							+2.936	- .103	+ .581	1.7641761				
$\lambda_8 =$								+2.927	-2.691	0.4299137				
Adopted angular errors in seconds														
$x_1 =$	- .16	$x_4 =$	- .18	$x_7 =$	+ .14	$x_{10} =$	- .23	$x_{13} =$	- .58	$x_{16} =$	+ .21			
$x_2 =$	- .11	$x_5 =$	- .11	$x_8 =$	- .02	$x_{11} =$	- .06	$x_{14} =$	+ .06	$x_{17} =$	- .19			
$x_3 =$	- .30	$x_6 =$	- .14	$x_9 =$	+ .03	$x_{12} =$	- .05	$x_{15} =$	- .21	$x_{18} =$	+ .15			
$[wx^2] = 7.62$														

Figure No. 59.

Observed Angles				Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1 = -$	$.45,$	$\lambda_1$			
					$x_1$	$+x_6$	$+x_{12}$	$=e_2 = -$	$.75,$	$\lambda_2$			
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = +$	$.71,$	$\lambda_3$			
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = -$	$.72,$	$\lambda_4$			
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = +$	$.01,$	$\lambda_5$			
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = -$	$.14,$	$\lambda_6$			
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$=e_7 = -$	$.73,$	$\lambda_7$
					$+ .55x_3$	$-.74x_2$	$+ .65x_1$	$-.43x_{12}$	$+ .99x_{11}$	$-.69x_{18}$	} $=e_8 = -$	$.62,$	$\lambda_8$
					$+ .54x_{15}$	$-.76x_{18}$	$+ .48x_{17}$	$-.40x_{14}$	$+ .31x_{13}$	$-.53x_4$			
1	56	52	48.29	.13									
2	53	21	48.65	.18									
3	61	3	26.73	.13									
4	62	0	22.52	.07									
5	65	34	44.87	.16									
6	56	34	47.10	.09									
7	79	28	29.37	.17									
8	65	42	14.90	.07									
9	47	27	19.54	.04									
10	45	12	23.49	.19									
11	45	13	44.21	.08									
12	66	32	24.50	.30									
13	72	47	14.31	.16									
14	68	12	48.58	.14									
15	61	40	11.33	.05									
16	55	17	47.73	.10									
17	64	19	52.35	.11									
18	52	37	33.58	.07									
Equations between the factors													
		No. of e		Value of e		Co-efficients of							
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
				1	-.45	+.47						+.16	-.061
				2	-.75		+.52					+.09	-.044
				3	+.71			+.35				+.17	+.010
				4	-.72				+.19			+.07	-.026
				5	+.01					+.29		+.04	-.003
				6	-.14			*			+.42	+.19	+.013
				7	-.73							+.72	
				8	-.62								+.512
Values of the Factors													
Factor	Symbolical								Numerical	Logarithmic			
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$					
$\lambda_1 =$	+.2431	+.160	+.368	+.327	+.110	+.341	-.776	+.306	-.858	$\bar{1}^{\circ}9334873$			
$\lambda_2 =$		+.2008	+.187	+.173	+.057	+.173	-.397	+.194	-1.424	0.1535100			
$\lambda_3 =$			+.3383	+.399	+.149	+.489	-1.083	+.003	+2.530	0.4031205			
$\lambda_4 =$				+.5617	+.119	+.370	-.840	+.324	-3.676	0.5653755			
$\lambda_5 =$					+.3491	+.139	-.310	+.038	+.146	$\bar{1}^{\circ}1643529$			
$\lambda_6 =$			*			+.2836	-1.006	-.006	+.140	$\bar{1}^{\circ}1461280$			
$\lambda_7 =$							+.2235	-.126	-.933	$\bar{1}^{\circ}9698816$			
$\lambda_8 =$								+.2023	-1.676	0.2242740			
Adopted angular errors in seconds													
$x_1 = -$	.33	$x_4 = +$	.07	$x_7 = +$	.27	$x_{10} = -$	.15	$x_{13} = -$	.06	$x_{16} = +$	.37		
$x_2 = +$	.07	$x_5 = -$	.29	$x_8 = -$	.32	$x_{11} = +$	.07	$x_{14} = +$	.11	$x_{17} = -$	.07		
$x_3 = -$	.23	$x_6 = -$	.21	$x_9 = -$	.03	$x_{12} = -$	.21	$x_{15} = -$	.23	$x_{18} = -$	.17		
$[wx^2] = 7.61$													



Figure No. 60.

Observed Angles			Equations to be satisfied											Factor			
No.	Value	Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	...	...	...	...	...	...	...	...	...	$=e_1 = -0.55$	$\lambda_1$	
1	61 24 43.59	.18	$x_1$	$+x_6$	$+x_{13}$	...	...	...	...	...	...	...	...	$=e_2 = +.20$	$\lambda_2$		
2	58 46 54.52	.18	$x_4$	$+x_{10}$	$+x_{14}$	...	...	...	...	...	...	...	...	$=e_3 = -.42$	$\lambda_3$		
3	63 57 36.26	.14	$x_9$	$+x_{15}$	$+x_{16}$	...	...	...	...	...	...	...	...	$=e_4 = +.63$	$\lambda_4$		
4	57 3 13.72	.10	$x_7$	$+x_{12}$	$+x_{20}$	...	...	...	...	...	...	...	...	$=e_5 = -.63$	$\lambda_5$		
5	57 15 29.30	.08	$x_{11}$	$+x_{21}$	$+x_{25}$	...	...	...	...	...	...	...	...	$=e_6 = +.31$	$\lambda_6$		
6	62 30 56.40	.12	$x_{22}$	$+x_{24}$	$+x_{27}$	...	...	...	...	...	...	...	...	$=e_7 = .18$	$\lambda_7$		
7	55 9 48.50	.14	$x_8$	$+x_{17}$	$+x_{19}$	...	...	...	...	...	...	...	...	$=e_8 = .13$	$\lambda_8$		
8	49 51 42.65	.20	$x_{18}$	$+x_{28}$	$+x_{26}$	...	...	...	...	...	...	...	...	$=e_9 = -.56$	$\lambda_9$		
9	77 53 23.93	.14	$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	...	...	...	...	...	$=e_{10} = +.15$	$\lambda_{10}$		
10	57 18 39.37	.05	$x_{19}$	$+x_{20}$	$+x_{21}$	$+x_{22}$	$+x_{23}$	...	...	...	...	...	...	$=e_{11} = .13$	$\lambda_{11}$		
11	34 55 50.22	.08	$.54x_1 - .61x_2 + .49x_3 - .65x_4 + .45x_{14} - .83x_{15} + .79x_{16} - .32x_{17} + .63x_{19} - .42x_{20} + .64x_{22} - .67x_{23}$											$=e_{12} = -1.09$	$\lambda_{12}$		
12	57 27 48.51	.10	$.70x_7 - .84x_8 + .32x_{17} - .64x_{18} + .86x_{28} - 1.01x_{27} + .46x_{24} - .73x_{26} + 1.43x_{11} - .64x_{12}$											$=e_{13} = 0.05$	$\lambda_{13}$		
13	56 4 20.95	.06	Equations between the factors														
14	65 38 7.04	.16	No. of e	Value of e	Co-efficients of												
15	50 19 18.72	.22			$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$	$\lambda_{13}$
16	51 47 18.56	.04	1	-0.55	+0.40								+0.08		-0.041		
17	72 18 3.97	.06	2	+0.20		+0.36							+0.12		+0.057		
18	57 17 27.31	.06	3	-0.42			+0.31						+0.05		+0.007		
19	57 50 14.01	.13	4	+0.63				+0.40					+0.14		-0.151		
20	67 22 23.02	.06	5	-0.63					+0.30				+0.14	+0.06	+0.039	+0.034	
21	91 19 23.32	.08	6	+0.31						+0.25			+0.14	+0.08	+0.048		
22	70 3 34.53	.05	7	.18							+0.28			+0.05	-0.130		
23	73 24 25.25	.06	8	.13								+0.39		+0.20	+0.13	+0.063	
24	65 9 36.86	.07	9	-0.56			*						+0.19	+0.06	+0.022		
25	53 44 47.26	.09	10	+0.15										+0.73	-0.070		
26	49 18 7.38	.07	11	.13											+0.38		
27	44 46 49.21	.16	12	-1.09												+0.541	-0.047
			13	.05													+0.723
Values of the Factors																	
Factor	Symbolical													Numerical	Logarithmic		
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$	$e_{10}$	$e_{11}$	$e_{12}$	$e_{13}$				
$\lambda_1 =$	+2.6195	+1.242	+0.726	+2.543	+2.317	+0.592	+0.425	+2.813	+0.595	-4.810	-1.947	+2.279	+0.172	-1.7498	0.2429884		
$\lambda_2 =$		3.1003	.1371	.1480	.4690	.0792	.0382	.5438	.0774	.8008	.2412	-3.503	-0.110	+5.816	1.7646244		
$\lambda_3 =$			3.2894	.1170	.2133	.0412	.0239	.2510	.0411	.3879	.1306	.0497	+0.012	-1.4491	0.1610984		
$\lambda_4 =$				3.1115	.3503	.1144	.0946	.4479	.1168	.8429	.3905	.8386	.0542	+5.277	1.7223871		
$\lambda_5 =$					4.2107	.3912	.1382	1.0269	.3758	1.2876	1.1384	-2.506	-1.398	-2.5433	0.4053976		
$\lambda_6 =$						4.4424	.1121	.4508	.4189	.2655	1.2407	+0.570	.2350	+7.613	1.8815558		
$\lambda_7 =$							4.1218	.6800	.1737	.1617	.8630	.1012	+8.529	.4250	1.6283889		
$\lambda_8 =$								4.2879	.5000	1.5228	1.8585	-2.268	.7505	-2.372	1.3751147		
$\lambda_9 =$									5.6689	.2637	1.2403	+0.654	-1.050	3.4134	0.5331872		
$\lambda_{10} =$					*										1.9348518		
$\lambda_{11} =$										+2.4045	+8.435	-0.031	.0241	+8.607	0.1595973		
$\lambda_{12} =$											4.0566	.2513	.2989	1.4441	0.2958529		
$\lambda_{13} =$												+2.2189	+1.214	-1.9763	2.9535057		
													+1.7221	+0.862			
Adopted angular errors in seconds																	
$x_1 = -.09$	$x_6 = +.18$	$x_{11} = +.07$	$x_{16} = -.04$	$x_{21} = +.18$	$x_{26} = -.23$												
$x_2 = -.10$	$x_7 = -.23$	$x_{12} = -.39$	$x_{17} = +.03$	$x_{22} = +.09$	$x_{27} = +.06$												
$x_3 = -.38$	$x_8 = +.11$	$x_{13} = +.11$	$x_{18} = -.21$	$x_{23} = -.12$													
$x_4 = -.02$	$x_9 = +.19$	$x_{14} = -.37$	$x_{19} = -.01$	$x_{24} = +.03$													
$x_5 = -.07$	$x_{10} = -.03$	$x_{15} = +.48$	$x_{20} = -.01$	$x_{25} = +.06$													
$[wx^2] = 8.30$																	

Figure No. 61.

OBSERVED ANGLES														
No.	Value			Reciprocal Weight	No.	Value			Reciprocal Weight	No.	Value			Reciprocal Weight
	°	'	"			°	'	"			°	'	"	
1	48	49	32.45	.24	12	75	38	16.87	.05	23	60	25	57.48	.14
2	75	50	18.73	.08	13	73	5	30.22	.11	24	67	39	25.70	.06
3	55	32	8.94	.12	14	72	41	27.06	.09	25	58	47	25.05	.10
4	36	33	14.52	.14	15	62	14	25.39	.13	26	60	6	55.31	.04
5	48	37	33.00	.08	16	59	1	20.55	.16	27	53	6	24.94	.04
6	55	32	11.52	.05	17	60	5	12.31	.14	28	50	6	9.96	.07
7	64	16	37.68	.24	18	47	44	43.93	.14	29	59	20	20.28	.09
8	59	48	38.99	.14	19	45	54	51.50	.05	30	60	50	5.32	.04
9	61	23	41.68	.18	20	60	6	9.74	.16	31	60	13	42.96	.05
10	70	21	16.61	.05	21	67	52	15.33	.10	32	61	51	45.33	.21
11	67	58	38.73	.14	22	58	1	20.07	.08	33	65	13	41.03	.06

Equations to be satisfied										Factor
$x_2 +$	$x_3 +$	$x_5 \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_1 = +0.01, \lambda_1$
$x_1 +$	$x_6 +$	$x_{12} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_2 = +.36, \lambda_2$
$x_4 +$	$x_{10} +$	$x_{18} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_3 = +.74, \lambda_3$
$x_7 +$	$x_{11} +$	$x_{18} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_4 = -.17, \lambda_4$
$x_8 +$	$x_{17} +$	$x_{20} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_5 = +.42, \lambda_5$
$x_{16} +$	$x_{21} +$	$x_{27} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_6 = +.12, \lambda_6$
$x_{22} +$	$x_{28} +$	$x_{32} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_7 = +.03, \lambda_7$
$x_{23} +$	$x_{31} +$	$x_{29} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_8 = +.03, \lambda_8$
$x_{30} +$	$x_{36} +$	$x_{37} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_9 = -.31, \lambda_9$
$x_{25} +$	$x_{33} +$	$x_{40} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_{10} = -.45, \lambda_{10}$
$x_{34} +$	$x_{39} +$	$x_{42} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_{11} = -.09, \lambda_{11}$
$x_9 +$	$x_{14} +$	$x_{19} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_{12} = -.23, \lambda_{12}$
$x_{15} +$	$x_{24} +$	$x_{28} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_{13} = +.41, \lambda_{13}$
$x_{35} +$	$x_{38} +$	$x_{41} \dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_{14} = +.35, \lambda_{14}$
$x_5 +$	$x_6 +$	$x_7 +$	$x_8 +$	$x_9 +$	$x_{10}$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_{15} = -.52, \lambda_{15}$
$x_{19} +$	$x_{20} +$	$x_{21} +$	$x_{22} +$	$x_{23} +$	$x_{24}$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_{16} = -.18, \lambda_{16}$
$x_{31} +$	$x_{32} +$	$x_{33} +$	$x_{34} +$	$x_{35} +$	$x_{36}$	$\dots$	$\dots$	$\dots$	$\dots$	$=e_{17} = +.34, \lambda_{17}$
$0.69x_3 - .25x_2 + .30x_{13} - 1.35x_4 + .97x_{19} - .31x_{14} + .58x_{17} - .57x_{20} + .40x_{11} - .91x_{18}$										$=e_{18} = -.62, \lambda_{18}$
$+ .87x_1 - .26x_{13}$										
$0.31x_{14} - .55x_9 + .84x_{28} - .53x_{15} + .57x_{31} - .59x_{29} + .57x_{26} - .53x_{32} + .60x_{16} - .75x_{27}$										$=e_{19} = -1.47, \lambda_{19}$
$+ .58x_8 - .58x_{17}$										
$0.59x_{29} - .57x_{23} + .67x_{37} - .56x_{30} + .61x_{41} - .55x_{38} + .37x_{39} - .56x_{42} + .61x_{25} - .67x_{40}$										$=e_{20} = -.86, \lambda_{20}$
$+ .62x_{22} - .57x_{26}$										



Figure No. 61—(Continued.)

Values of the Factors												
Factor	SYMBOLICAL											
	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	e <sub>4</sub>	e <sub>5</sub>	e <sub>6</sub>	e <sub>7</sub>	e <sub>8</sub>	e <sub>9</sub>	e <sub>10</sub>	e <sub>11</sub>	e <sub>12</sub>
λ <sub>1</sub> =	+3.8521	+ .3259	- .0930	+ .2565	+ .2745	+ .0650	+ .0782	+ .1014	+ .0144	+ .0190	+ .0250	+ .4325
λ <sub>2</sub> =		3.5715	.4637	.0248	.1566	.0857	.0564	.0907	.0194	.0240	.0283	.2684
λ <sub>3</sub> =			+3.8670	.3013	.1382	-.0363	.0227	.0050	-.0088	-.0085	-.0072	.1878
λ <sub>4</sub> =				2.4540	.4264	+ .0483	.1094	.1225	+ .0106	+ .0160	+ .0239	.6488
λ <sub>5</sub> =					3.0077	.3810	.5248	.6554	.0863	.1130	.1528	.7372
λ <sub>6</sub> =						3.7653	.2818	.4539	.1000	.1200	.1428	.1094
λ <sub>7</sub> =							5.0870	1.0496	.5888	.8275	1.2161	.4625
λ <sub>8</sub> =								4.5639	.1338	.2555	.4839	.4756
λ <sub>9</sub> =									6.6356	.4035	.3672	.0225
λ <sub>10</sub> =										5.4790	.5600	.0406
λ <sub>11</sub> =											6.4489	.0741
λ <sub>12</sub> =				*								4.2119
λ <sub>13</sub> =												
λ <sub>14</sub> =												
λ <sub>15</sub> =												
λ <sub>16</sub> =												
λ <sub>17</sub> =												
λ <sub>18</sub> =												
λ <sub>19</sub> =												
λ <sub>20</sub> =												

Factor	SYMBOLICAL									Numerical	Logarithmic
	e <sub>13</sub>	e <sub>14</sub>	e <sub>15</sub>	e <sub>16</sub>	e <sub>17</sub>	e <sub>18</sub>	e <sub>19</sub>	e <sub>20</sub>			
λ <sub>1</sub> =	+ .0435	+ .0344	- .6725	- .1904	- .0507	- .3941	- .0071	- .0222		+ 0.7277	1.8619404
λ <sub>2</sub> =	.0388	.0391	.3509	.1861	.0581	1.0039	.1080	.0377		1.9801	0.2066871
λ <sub>3</sub> =	.0023	-.0100	.3859	+ .0137	+ .0156	+ .9023	+ .1435	+ .0242		2.0714	0.3162640
λ <sub>4</sub> =	.0527	+ .0325	1.0816	- .2118	- .0475	.2328	.1020	-.0079		.1775	1.2491494
λ <sub>5</sub> =	.2823	.2097	.9339	1.2062	.3098	-.0332	.0959	.1186		1.9409	0.2880032
λ <sub>6</sub> =	.1946	.1956	.1382	.9344	.2924	.1135	-.5487	.1900		1.8374	0.2642037
λ <sub>7</sub> =	.3062	1.6690	.2470	1.2293	2.4499	.0351	+ .5821	.5435		- .4529	1.6559640
λ <sub>8</sub> =	.3696	.6666	.2897	1.5539	.9613	.0834	.2904	+ .1952		+ .1500	1.1761781
λ <sub>9</sub> =	.0438	.4997	.0308	.2118	.7688	.0265	-.1338	-1.0167		-1.1349	0.0549576
λ <sub>10</sub> =	.0585	.7659	.0425	.2753	1.1466	.0304	.1280	.7946		1.6922	0.2284517
λ <sub>11</sub> =	.0819	1.2275	.0609	.3693	1.7910	.0337	.0909	.1337		.6079	1.7838607
λ <sub>12</sub> =	.2058	.1019	1.4356	.7780	.1471	.0992	+ .6819	+ .0214		.5229	1.7184020
λ <sub>13</sub> =	4.0054	.1119	.1250	.6687	.1648	.0356	.1296	- .0536		+ 1.7636	0.2464001
λ <sub>14</sub> =		4.8122	.0834	.5062	2.4609	.0461	- .1230	.1634		.9273	1.9672296
λ <sub>15</sub> =			+ 2.3471	+ .5158	+ .1230	+ .0098	.1537	+ .0333		- 1.4558	0.1631017
λ <sub>16</sub> =				2.8788	.7482	.1915	.1148	.3011		- 1.5153	0.1804986
λ <sub>17</sub> =					3.5955	.0695	+ .1955	.3999		+ .1006	1.0025548
λ <sub>18</sub> =			*			1.7387	.2265	.0567		- 1.2268	0.0887738
λ <sub>19</sub> =							2.6698	.4078		4.2379	0.6271507
λ <sub>20</sub> =								3.9668		3.4588	0.5389255

Adopted angular errors in seconds							
x <sub>1</sub> = +.22	x <sub>7</sub> = -.31	x <sub>13</sub> = +.19	x <sub>19</sub> = -.16	x <sub>25</sub> = -.37	x <sub>31</sub> = -.11	x <sub>37</sub> = -.29	
x <sub>2</sub> = +.08	x <sub>8</sub> = -.27	x <sub>14</sub> = -.13	x <sub>20</sub> = +.18	x <sub>26</sub> = -.05	x <sub>32</sub> = +.40	x <sub>38</sub> = +.16	
x <sub>3</sub> = -.01	x <sub>9</sub> = +.06	x <sub>15</sub> = +.52	x <sub>21</sub> = +.03	x <sub>27</sub> = +.20	x <sub>33</sub> = -.10	x <sub>39</sub> = -.08	
x <sub>4</sub> = +.52	x <sub>10</sub> = +.03	x <sub>16</sub> = -.11	x <sub>22</sub> = -.32	x <sub>28</sub> = -.12	x <sub>34</sub> = -.05	x <sub>40</sub> = +.02	
x <sub>5</sub> = -.06	x <sub>11</sub> = -.04	x <sub>17</sub> = -.51	x <sub>23</sub> = +.08	x <sub>29</sub> = +.06	x <sub>35</sub> = +.23	x <sub>41</sub> = -.04	
x <sub>6</sub> = +.03	x <sub>12</sub> = +.11	x <sub>18</sub> = +.18	x <sub>24</sub> = +.01	x <sub>30</sub> = +.01	x <sub>36</sub> = -.03	x <sub>42</sub> = +.04	
[wx <sup>2</sup> ] = 16.60							

Figure No. 62.

OBSERVED ANGLES																			
No.	Value			Reciprocal Weight	No.	Value			Reciprocal Weight	No.	Value			Reciprocal Weight					
	°	'	"			°	'	"			°	'	"						
1	46	29	35.38	.05	12	71	15	14.86	.05	23	61	59	19.66	.18	34	58	51	2.01	.06
2	54	45	46.58	.05	13	60	14	22.71	.18	24	55	21	49.52	.12	35	62	23	39.61	.06
3	79	15	50.59	.06	14	62	27	32.67	.25	25	58	43	43.67	.05	36	49	50	13.88	.06
4	47	54	54.85	.05	15	75	9	47.27	.13	26	62	15	33.47	.06	37	70	22	56.50	.04
5	45	58	22.53	.13	16	59	23	48.38	.07	27	57	35	43.88	.07	38	51	57	2.64	.11
6	62	15	10.73	.15	17	57	38	27.32	.16	28	49	28	23.96	.05	39	57	30	41.59	.04
7	61	25	53.76	.10	18	57	6	18.73	.07	29	50	53	56.35	.25	40	58	58	14.21	.06
8	58	0	39.04	.19	19	57	3	17.08	.04	30	59	46	50.54	.07	41	65	39	18.05	.08
9	60	29	11.30	.18	20	64	20	53.94	.13	31	67	6	44.91	.09	42	63	38	17.23	.09
10	71	50	42.64	.03	21	63	0	27.98	.09	32	59	30	16.05	.08					
11	61	27	47.38	.08	22	58	14	12.30	.11	33	62	18	2.92	.06					

Equations to be satisfied										Factor
$x_2$	$+x_3$	$+x_5$	..	..	..	..	..	..	..	$=e_1 = -0.98, \lambda_1$
$x_1$	$+x_6$	$+x_{13}$	..	..	..	..	..	..	..	$=e_2 = +0.20, \lambda_2$
$x_4$	$+x_{10}$	$+x_{18}$	..	..	..	..	..	..	..	$=e_3 = -0.44, \lambda_3$
$x_7$	$+x_{11}$	$+x_{18}$	..	..	..	..	..	..	..	$=e_4 = -0.75, \lambda_4$
$x_8$	$+x_{17}$	$+x_{20}$	..	..	..	..	..	..	..	$=e_5 = -0.28, \lambda_5$
$x_{16}$	$+x_{21}$	$+x_{27}$	..	..	..	..	..	..	..	$=e_6 = -0.35, \lambda_6$
$x_{22}$	$+x_{26}$	$+x_{33}$	..	..	..	..	..	..	..	$=e_7 = +1.23, \lambda_7$
$x_{23}$	$+x_{29}$	$+x_{31}$	..	..	..	..	..	..	..	$=e_8 = +0.17, \lambda_8$
$x_{30}$	$+x_{36}$	$+x_{37}$	..	..	..	..	..	..	..	$=e_9 = +0.27, \lambda_9$
$x_{26}$	$+x_{33}$	$+x_{40}$	..	..	..	..	..	..	..	$=e_{10} = +0.22, \lambda_{10}$
$x_{24}$	$+x_{39}$	$+x_{42}$	..	..	..	..	..	..	..	$=e_{11} = +0.30, \lambda_{11}$
$x_9$	$+x_{14}$	$+x_{19}$	..	..	..	..	..	..	..	$=e_{12} = +0.52, \lambda_{12}$
$x_{15}$	$+x_{24}$	$+x_{28}$	..	..	..	..	..	..	..	$=e_{13} = +0.10, \lambda_{13}$
$x_{35}$	$+x_{38}$	$+x_{41}$	..	..	..	..	..	..	..	$=e_{14} = -0.29, \lambda_{14}$
$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	..	..	..	..	$=e_{15} = 0.00, \lambda_{15}$
$x_{19}$	$+x_{20}$	$+x_{31}$	$+x_{23}$	$+x_{23}$	$+x_{24}$	..	..	..	..	$=e_{16} = +0.48, \lambda_{16}$
$x_{31}$	$+x_{33}$	$+x_{38}$	$+x_{34}$	$+x_{35}$	$+x_{36}$	..	..	..	..	$=e_{17} = -0.62, \lambda_{17}$
$+ .19x_2 - .71x_3 + .57x_{13} - .90x_4 + .65x_{19} - .52x_{14} + .63x_{17} - .48x_{20} + .54x_{11} - .65x_{18}$										$=e_{18} = -1.71, \lambda_{18}$
$+ .95x_1 - .34x_{12}$										
$+ .52x_{14} - .57x_9 + .85x_{28} - .26x_{15} + .42x_{31} - .81x_{29} + .53x_{26} - .59x_{33} + .59x_{16} - .63x_{27}$										$=e_{19} = +0.33, \lambda_{19}$
$+ .62x_8 - .63x_{17}$										
$+ .81x_{29} - .53x_{23} + .36x_{37} - .58x_{20} + .45x_{41} - .78x_{38} + .64x_{39} - .50x_{42} + .61x_{25} - .60x_{40}$										$=e_{20} = -0.43, \lambda_{20}$
$+ .62x_{22} - .53x_{26}$										



Figure No. 62--(Continued.)

Values of the Factors												
Factor	SYMBOLICAL											
	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	e <sub>4</sub>	e <sub>5</sub>	e <sub>6</sub>	e <sub>7</sub>	e <sub>8</sub>	e <sub>9</sub>	e <sub>10</sub>	e <sub>11</sub>	e <sub>12</sub>
λ <sub>1</sub> =	+4'9038	+ '7328	+ '0715	+ '5216	+ '5310	+ '0748	+ '1056	+ '1060	+ '0182	+ '0182	+ '0163	+ '5828
λ <sub>2</sub> =		4'8928	'2388	'5632	'0613	'1000	'1360	'0888	'0059	'0159	'0089	'4947
λ <sub>3</sub> =			4'0254	'0964	'1881	'0335	'0424	- '0065	- '0100	'0000	- '0053	- '0304
λ <sub>4</sub> =				4'3812	'4117	'0600	'0828	+ '0704	+ '0094	'0124	+ '0095	+ '3894
λ <sub>5</sub> =					2'7550	'3335	'4584	'3373	'0347	'0600	'0389	'4089
λ <sub>6</sub> =						4'7391	'5416	'4437	'0565	'0776	'0574	'1230
λ <sub>7</sub> =							5'1504	'8856	'4124	'4841	'3921	'1711
λ <sub>8</sub> =								2'7700	'2406	'3029	'2353	'1496
λ <sub>9</sub> =									6'3894	'4535	'4363	'0213
λ <sub>10</sub> =										6'3271	'4026	'0257
λ <sub>11</sub> =											5'6426	'0202
λ <sub>12</sub> =					*							2'6557
λ <sub>13</sub> =												
λ <sub>14</sub> =												
λ <sub>15</sub> =												
λ <sub>16</sub> =												
λ <sub>17</sub> =												
λ <sub>18</sub> =												
λ <sub>19</sub> =												
λ <sub>20</sub> =												

Factor	SYMBOLICAL									Numerical	Logarithmic
	e <sub>13</sub>	e <sub>14</sub>	e <sub>15</sub>	e <sub>16</sub>	e <sub>17</sub>	e <sub>18</sub>	e <sub>19</sub>	e <sub>20</sub>			
λ <sub>1</sub> =	+ '0720	+ '0120	- 1'2936	- '1878	- '0509	+ '3486	+ '0997	- '0016		- 5'4100	0'7331973
λ <sub>2</sub> =	'1053	- '0028	1'4183	'2573	'0520	- '3387	- '0788	'0763		+ '4662	1'6685723
λ <sub>3</sub> =	'0417	'0136	'2607	'0908	'0067	'6685	'1725	'0763		- '8113	1'9091708
λ <sub>4</sub> =	'0600	+ '0044	'9512	'1519	'0364	+ '0609	+ '0223	'0215		3'6716	0'5648554
λ <sub>5</sub> =	'3453	'0052	1'0394	'8559	'1860	- '3059	- '1018	'1980		'4878	1'6882685
λ <sub>6</sub> =	'3970	'0232	'1516	'9983	'2327	'0711	+ '0747	'1646		1'0947	0'0392951
λ <sub>7</sub> =	'5480	'2292	'2102	1'3806	1'4182	'0829	'1472	'5561		+ 7'0694	0'8493826
λ <sub>8</sub> =	'4260	'1188	'1727	1'1132	'8981	+ '1174	'6484	'4833		1'7057	0'2319026
λ <sub>9</sub> =	'0487	'3832	'0220	'1365	1'2499	'0557	'1977	+ '4154		2'8617	0'4566241
λ <sub>10</sub> =	'0747	'3140	'0301	'1943	1'2556	'0152	'0984	'0638		2'8092	0'4485827
λ <sub>11</sub> =	'0520	'3204	'0222	'1412	1'1205	'0367	'1445	'2573		2'7970	0'4466925
λ <sub>12</sub> =	'1230	'0108	'9549	'3123	'0760	'6305	'0649	- '0375		- '4082	1'6108411
λ <sub>13</sub> =	3'7403	'0144	'1535	1'0158	'2284	- '1066	- '0229	'2013		+ '7921	1'8987636
λ <sub>14</sub> =		4'3092	'0093	'0517	'8458	+ '0661	+ '2048	+ '5322		- '4659	1'6683114
λ <sub>15</sub> =			+ 2'3763	+ '3865	+ '0905	- '0609	- '0321	'0625		+ 1'5368	0'1866174
λ <sub>16</sub> =				2'5481	'5877	+ '2075	'1151	'4401		- 1'1084	0'0446965
λ <sub>17</sub> =					3'5624	- '0176	'2148	'0459		4'4483	0'6481941
λ <sub>18</sub> =		*				+ 3'0277	+ '7896	'3100		4'7443	0'6761721
λ <sub>19</sub> =							2'3016	'7661		'5128	1'7099311
λ <sub>20</sub> =								2'7167		1'8676	0'2712839

Adopted angular errors in seconds

x <sub>1</sub> = -'20	x <sub>7</sub> = -'21	x <sub>13</sub> = -'62	x <sub>19</sub> = -'18	x <sub>25</sub> = +'07	x <sub>31</sub> = -'27	x <sub>37</sub> = +'08
x <sub>2</sub> = -'10	x <sub>8</sub> = +'13	x <sub>14</sub> = +'45	x <sub>20</sub> = +'08	x <sub>26</sub> = +'47	x <sub>32</sub> = +'23	x <sub>38</sub> = +'11
x <sub>3</sub> = -'38	x <sub>9</sub> = +'25	x <sub>15</sub> = +'12	x <sub>21</sub> = -'20	x <sub>27</sub> = -'04	x <sub>33</sub> = -'10	x <sub>39</sub> = +'06
x <sub>4</sub> = +'16	x <sub>10</sub> = +'02	x <sub>16</sub> = -'11	x <sub>22</sub> = +'53	x <sub>28</sub> = +'02	x <sub>34</sub> = -'10	x <sub>40</sub> = +'25
x <sub>5</sub> = -'50	x <sub>11</sub> = -'50	x <sub>17</sub> = -'49	x <sub>23</sub> = +'29	x <sub>29</sub> = +'15	x <sub>35</sub> = -'29	x <sub>41</sub> = -'11
x <sub>6</sub> = +'30	x <sub>12</sub> = +'10	x <sub>18</sub> = -'04	x <sub>24</sub> = -'04	x <sub>30</sub> = +'28	x <sub>36</sub> = -'09	x <sub>42</sub> = +'34

[wx<sup>2</sup>] = 31'22

Figure No. 63.

OBSERVED ANGLES																			
No.	Value			Reciprocal Weight	No.	Value			Reciprocal Weight	No.	Value			Reciprocal Weight					
	°	'	"			°	'	"			°	'	"						
1	52	11	53.08	.05	13	56	0	54.23	.05	25	47	11	37.07	.06	37	57	41	2.82	.09
2	60	34	36.12	.04	14	67	41	51.38	.04	26	49	7	41.74	.08	38	56	21	33.33	.03
3	66	11	42.85	.04	15	57	2	55.09	.07	27	42	10	59.44	.14	39	57	20	9.28	.12
4	55	47	25.00	.10	16	77	20	57.78	.13	28	46	3	58.20	.10	40	54	53	2.63	.08
5	53	13	41.14	.08	17	78	8	39.31	.19	29	46	22	28.13	.03	41	65	18	16.79	.10
6	60	6	16.14	.05	18	54	36	43.37	.12	30	51	8	52.55	.03	42	80	28	53.60	.17
7	73	57	59.10	.03	19	71	13	4.19	.07	31	44	26	10.46	.06	43	79	12	16.52	.10
8	48	57	18.42	.26	20	74	12	53.01	.11	32	57	38	3.72	.03	44	72	40	16.36	.06
9	51	7	58.70	.18	21	84	40	14.51	.26	33	56	39	26.16	.28	45	70	17	58.79	.07
10	56	35	4.55	.09	22	81	40	26.29	.16	34	60	5	0.39	.13	46	57	43	55.68	.10
11	54	24	23.06	.12	23	50	1	6.16	.07	35	67	23	1.91	.50	47	49	38	41.68	.09
12	67	9	40.46	.06	24	47	26	58.78	.23	36	60	51	17.49	.24	48	48	50	44.13	.04

Equations to be satisfied										Factor
$x_2 + x_3 + x_5$	..	..	..	..	..	..	..	..	..	$= e_1 = -0.48, \lambda_1$
$x_1 + x_6 + x_{14}$	..	..	..	..	..	..	..	..	..	$= e_2 = +0.02, \lambda_2$
$x_4 + x_{12} + x_{15}$	..	..	..	..	..	..	..	..	..	$= e_3 = -0.09, \lambda_3$
$x_7 + x_{18} + x_{23}$	..	..	..	..	..	..	..	..	..	$= e_4 = -1.10, \lambda_4$
$x_8 + x_{21} + x_{29}$	..	..	..	..	..	..	..	..	..	$= e_5 = +0.37, \lambda_5$
$x_9 + x_{32} + x_{35}$	..	..	..	..	..	..	..	..	..	$= e_6 = +1.36, \lambda_6$
$x_{19} + x_{30} + x_{33}$	..	..	..	..	..	..	..	..	..	$= e_7 = -0.17, \lambda_7$
$x_{18} + x_{34} + x_{41}$	..	..	..	..	..	..	..	..	..	$= e_8 = +0.07, \lambda_8$
$x_{35} + x_{40} + x_{46}$	..	..	..	..	..	..	..	..	..	$= e_9 = -0.22, \lambda_9$
$x_{36} + x_{45} + x_{48}$	..	..	..	..	..	..	..	..	..	$= e_{10} = -0.09, \lambda_{10}$
$x_{37} + x_{47} + x_{44}$	..	..	..	..	..	..	..	..	..	$= e_{11} = +0.37, \lambda_{11}$
$x_{20} + x_{33} + x_{26}$	..	..	..	..	..	..	..	..	..	$= e_{12} = +0.26, \lambda_{12}$
$x_{10} + x_{16} + x_{28}$	..	..	..	..	..	..	..	..	..	$= e_{13} = -0.24, \lambda_{13}$
$x_{11} + x_{17} + x_{24}$	..	..	..	..	..	..	..	..	..	$= e_{14} = +0.41, \lambda_{14}$
$x_{31} + x_{38} + x_{43}$	..	..	..	..	..	..	..	..	..	$= e_{15} = -0.23, \lambda_{15}$
$x_{27} + x_{39} + x_{42}$	..	..	..	..	..	..	..	..	..	$= e_{16} = +1.75, \lambda_{16}$
$x_5 + x_6 + x_7 + x_8 + x_{10} + x_{13}$	..	..	..	..	..	..	..	..	..	$= e_{17} = -0.19, \lambda_{17}$
$x_{32} + x_{34} + x_{35} + x_{36} + x_{37} + x_{38}$	..	..	..	..	..	..	..	..	..	$= e_{18} = -0.34, \lambda_{18}$
$x_8 + x_{10} - x_9 - x_{11}$	..	..	..	..	..	..	..	..	..	$= e_{19} = +1.21, \lambda_{19}$
$x_{19} + x_{21} - x_{20} - x_{22}$	..	..	..	..	..	..	..	..	..	$= e_{20} = -0.60, \lambda_{20}$
$x_{38} + x_{33} - x_{39} - x_{33}$	..	..	..	..	..	..	..	..	..	$= e_{21} = +1.61, \lambda_{21}$
$.41x_{14} - .78x_1 + .84x_{23} - .67x_{13} + .95x_{29} - .09x_{31} + .22x_{16} - .96x_{28} + .68x_4 - .65x_{15} + .56x_2 - .44x_3$										$= e_{22} = +2.446, \lambda_{22}$
$.46x_{41} - .71x_{18} + .63x_{46} - .70x_{40} + .87x_{48} - .36x_{45} + .31x_{44} - .85x_{47} + .1020x_{31} - .19x_{43} + .34x_{19} - .81x_{20}$										$= e_{23} = +1.045, \lambda_{23}$
$.92x_{24} - .21x_{17} + .15x_{23} - .93x_{35} + .95x_{29} - .09x_{31} + .22x_{16} - .96x_{28}$										$= e_{24} = +0.057, \lambda_{24}$
$.87x_{26} - .28x_{20} + .17x_{42} - 1.103x_{27} + 1.020x_{31} - .19x_{43} + .34x_{19} - .81x_{20}$										$= e_{25} = +0.299, \lambda_{25}$
$.93x_{25} - .81x_9 + .66x_{33} - .87x_{26} + .81x_{30} - .63x_{33} + .87x_8 - .95x_{29}$										$= e_{26} = +1.468, \lambda_{26}$



Figure No. 63—(Continued.)

No. of e	Value of e	Equations between the factors												
		Co-efficients of												
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$	$\lambda_{13}$
1	-0.48	+0.16												
2	+0.02		+0.14											
3	-0.09			+0.23										
4	-1.10				+0.15									
5	+0.37					+0.55								
6	+1.36						+0.40							
7	-0.17							+0.13						
8	+0.07								+0.35					
9	-0.22									+0.68				
10	-0.09										+0.35			
11	+0.37											+0.24		
12	+0.26												+0.47	
13	-0.24													+0.32
14	+0.41				*									
15	-0.23													
16	+1.75													
17	-0.19													
18	-0.34													
19	+1.21													
20	-0.60													
21	+1.61													
22	+2.446													
23	+1.045													
24	+0.57													
25	+2.99													
26	+1.468													

No. of e	Co-efficients of												
	$\lambda_{14}$	$\lambda_{15}$	$\lambda_{16}$	$\lambda_{17}$	$\lambda_{18}$	$\lambda_{19}$	$\lambda_{20}$	$\lambda_{21}$	$\lambda_{22}$	$\lambda_{23}$	$\lambda_{24}$	$\lambda_{25}$	$\lambda_{26}$
1				+0.08					+0.0048				
2				+0.05					-0.0226				
3				+0.06					+0.0225				
4				+0.03					+0.0253				
5				+0.26		+0.26	+0.26		+0.0051				+0.1977
6						-0.18	-0.16			+0.0051			-0.0900
7					+0.03		+0.07	+0.03		-0.0005		-0.0005	+0.0054
8					+0.13					-0.0392			
9					+0.50					+0.0070			
10					+0.24					+0.0096			
11					+0.09					-0.0579			
12							-0.11	-0.28				+0.0388	+0.1152
13				+0.09		+0.09			-0.0674		-0.0674		
14	+0.54					-0.12				+0.1717			
15		+0.19			+0.03			+0.03		+0.0422		+0.0422	
16			+0.43					-0.12				-0.1255	
17				+0.57		+0.35							+0.2262
18					+1.02			+0.06					-0.0189
19						+0.65							+0.3720
20							+0.60		-0.0234	+0.0238	-0.0474	+0.0546	
21								+0.46					-0.2037
22									+0.3326		+0.1277		-0.0271
23			*							+0.3646		+0.0938	-0.0197
24											+0.3863		-0.0790
25												+0.3382	-0.0803
26													+0.6081

Equations between the factors—(Continued.)

Figure No. 63—(Continued)

Factor	Values of the Factors															
	Symbolical															
	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	e <sub>4</sub>	e <sub>5</sub>	e <sub>6</sub>	e <sub>7</sub>	e <sub>8</sub>	e <sub>9</sub>	e <sub>10</sub>	e <sub>11</sub>	e <sub>12</sub>	e <sub>13</sub>	e <sub>14</sub>	e <sub>15</sub>	
λ <sub>1</sub> =	+ 7'3110	+ 0'7431	+ 0'5602	+ 0'4370	+ 0'6459	+ 0'3416	+ 1'299	+ 0'0006	+ 0'0006	+ 0'0005	+ 0'0009	- 0'0965	+ 0'3153	+ 0'2088	- 0'0108	
λ <sub>2</sub> =		7'7883	'3362	'1990	'4578	'2293	'0899	'0004	'0004	'0004	'0006	'0667	'3185	'2294	'0071	
λ <sub>3</sub> =			4'6688	'2789	'3386	'1848	'0691	'0003	'0003	'0003	'0005	'0514	'1226	'0729	'0059	
λ <sub>4</sub> =				6'9384	'2614	'1492	'0544	'0003	'0003	'0002	'0004	'0405	'0462	'0148	'0049	
λ <sub>5</sub> =					5'2620	- 2'4735	2'3371	'0042	- '0083	- '0091	'0135	1'6316	'7252	- '1903	+ '1336	
λ <sub>6</sub> =						+ 5'0243	- 1'8608	- '0044	+ '0034	+ '0042	- '0113	+ 1'3161	- '4583	+ '4033	- '0530	
λ <sub>7</sub> =							+ 10'1412	+ '1862	'3428	'3177	+ '2022	- 1'9592	+ '0280	'1698	+ '4377	
λ <sub>8</sub> =								3'2715	'7221	'6659	'4725	+ '1244	'0044	- '0038	'0589	
λ <sub>9</sub> =									2'8793	1'3121	'7405	'2328	'0126	'0127	'2254	
λ <sub>10</sub> =										4'0803	'6756	'2160	'0120	'0122	'2186	
λ <sub>11</sub> =											4'7513	'1331	'0023	'0010	- '0007	
λ <sub>12</sub> =					*							4'6147	- '0870	'0541	'4397	
λ <sub>13</sub> =													+ 4'0426	'6431	'2101	
λ <sub>14</sub> =														+ 2'7919	+ '2117	
λ <sub>15</sub> =															5'8121	
λ <sub>16</sub> =																
λ <sub>17</sub> =																
λ <sub>18</sub> =																
λ <sub>19</sub> =																
λ <sub>20</sub> =																
λ <sub>21</sub> =																
λ <sub>22</sub> =																
λ <sub>23</sub> =																
λ <sub>24</sub> =																
λ <sub>25</sub> =																
λ <sub>26</sub> =																

Factor	Symbolical											Numerical	Logarithmic
	e <sub>16</sub>	e <sub>17</sub>	e <sub>18</sub>	e <sub>19</sub>	e <sub>20</sub>	e <sub>21</sub>	e <sub>22</sub>	e <sub>23</sub>	e <sub>24</sub>	e <sub>25</sub>	e <sub>26</sub>		
λ <sub>1</sub> =	+ 0'0113	- 2'1171	- 0'0009	+ 0'9313	- 0'2317	- 0'0327	- 0'0806	+ 0'0025	- 0'0058	+ 0'0700	+ 0'0695	- 1'7928	0'2535198
λ <sub>2</sub> =	'0072	1'5238	'0006	'6729	'1597	'0237	+ '6270	'0017	'2511	'0475	'0458	+ 2'7947	0'4463419
λ <sub>3</sub> =	'0063	1'0994	'0005	'4824	'1235	'0169	- '3497	'0013	+ '1079	'0377	'0380	- '5656	1'7525442
λ <sub>4</sub> =	'0052	'8369	'0004	'3659	'0977	'0127	'6188	'0010	'2092	'0302	'0311	8'3837	0'9234347
λ <sub>5</sub> =	- '3115	1'2907	+ '0103	- 1'7926	5'6069	1'5755	'0195	'0719	- '6545	'4392	- '7648	6'9787	0'8437753
λ <sub>6</sub> =	+ '1642	'6783	- '0039	+ 2'7231	+ 2'0631	+ 1'0937	'0805	- '0528	+ '6347	- '4832	+ '2811	+ 10'2661	1'0114043
λ <sub>7</sub> =	- '6957	'2589	'4678	- '5291	- 3'1358	- 2'5865	'0158	+ '1109	- '9036	+ '0896	- 1'3178	- 9'8940	0'9953727
λ <sub>8</sub> =	+ '0185	'0012	'9880	'0114	'0068	+ '1995	'0001	'4228	+ '0041	- '1274	+ '0137	+ 1'2663	0'1032092
λ <sub>9</sub> =	'1044	'0012	1'9171	'0287	+ '0079	'4048	'0002	'0896	'0198	'0295	'0517	1'1245	0'0509752
λ <sub>10</sub> =	'1025	'0011	1'7848	'0272	'0090	'3783	'0002	'0262	'0194	'0104	'0501	1'0421	0'1718905
λ <sub>11</sub> =	- '0187	'0019	1'0189	'0082	- '0186	'1960	'0001	'8396	- '0024	'2517	'0003	2'9885	0'4754551
λ <sub>12</sub> =	+ '8794	+ '1923	'3174	+ '5326	+ 2'2068	3'5326	+ '0124	'0585	+ '5423	'3647	'6693	10'5144	1'0217827
λ <sub>13</sub> =	'3287	- '6612	'0169	- 1'4782	- '4057	'6185	'5101	- '0167	'9895	+ '5349	1'2909	1'7212	0'2358306
λ <sub>14</sub> =	- '3399	'4439	+ '0169	+ 1'7731	+ '0839	- '7226	'4387	+ '0220	- 1'7172	- '4735	- 1'2961	+ '9397	1'9729951
λ <sub>15</sub> =	'6064	+ '0214	- '3000	'4814	- '1242	1'1756	'0034	- '4691	'3294	'9535	'8612	- 5'7145	0'7569790
λ <sub>16</sub> =	+ 3'3899	- '0224	'1379	- '7330	+ '3315	+ 2'1468	- '0046	'2920	+ '5566	+ 1'5939	+ 1'4099	+ 10'9423	1'0391087
λ <sub>17</sub> =		+ 4'2380	+ '0018	1'8652	'4616	'0655	'0635	'0049	'0926	- '1393	- '1377	- 3'0017	0'4773673
λ <sub>18</sub> =			2'6096	+ '0387	- '0094	- '5499	+ '0003	'1670	- '0263	+ '0535	'0688	2'0096	0'3031107
λ <sub>19</sub> =				6'2452	+ 1'6927	1'1838	'0421	+ '0263	1'2116	- 1'3795	2'9692	+ 2'3486	0'3708035
λ <sub>20</sub> =					4'9339	+ 1'9482	'0317	- '0919	+ '9191	'7270	+ '6879	7'7256	0'8879307
λ <sub>21</sub> =						6'6425	- '0022	'0423	1'4453	+ 1'0042	3'2546	19'2179	1'2837056
λ <sub>22</sub> =							+ 3'7438	'0001	- 1'3504	- '0136	- '0210	9'7867	0'9906356
λ <sub>23</sub> =								+ 3'2208	'0509	'9600	'1059	2'8736	0'4584189
λ <sub>24</sub> =									+ 4'5539	+ '5250	+ 2'0012	1'0739	0'0309517
λ <sub>25</sub> =										4'5009	1'7186	5'1717	0'7136310
λ <sub>26</sub> =											5'2579	11'7049	1'0683695

Adopted angular errors in seconds					
x <sub>1</sub> = -'24	x <sub>9</sub> = -'28	x <sub>17</sub> = +'14	x <sub>25</sub> = +'122	x <sub>33</sub> = -'28	x <sub>41</sub> = +'26
x <sub>2</sub> = +'15	x <sub>10</sub> = +'10	x <sub>18</sub> = -'09	x <sub>26</sub> = +'38	x <sub>34</sub> = -'10	x <sub>42</sub> = +'2'01
x <sub>3</sub> = -'25	x <sub>11</sub> = -'17	x <sub>19</sub> = +'04	x <sub>27</sub> = +'73	x <sub>35</sub> = -'44	x <sub>43</sub> = -'72
x <sub>4</sub> = +'61	x <sub>12</sub> = -'22	x <sub>20</sub> = +'16	x <sub>28</sub> = -'87	x <sub>36</sub> = -'23	x <sub>44</sub> = +'23
x <sub>5</sub> = -'38	x <sub>13</sub> = -'76	x <sub>21</sub> = -'06	x <sub>29</sub> = -'38	x <sub>37</sub> = +'09	x <sub>45</sub> = '00
x <sub>6</sub> = -'01	x <sub>14</sub> = +'27	x <sub>22</sub> = +'42	x <sub>30</sub> = -'21	x <sub>38</sub> = +'34	x <sub>46</sub> = +'29
x <sub>7</sub> = -'34	x <sub>15</sub> = -'48	x <sub>23</sub> = '00	x <sub>31</sub> = +'15	x <sub>39</sub> = -'99	x <sub>47</sub> = +'05
x <sub>8</sub> = +'66	x <sub>16</sub> = +'53	x <sub>24</sub> = +'44	x <sub>32</sub> = '00	x <sub>40</sub> = -'07	x <sub>48</sub> = +'14

[wx<sup>2</sup>] = 123'42

Figure No. 64.

OBSERVED ANGLES																			
No.			Value			Reciprocal Weight			No.			Value			Reciprocal Weight				
° ' "			° ' "			° ' "			° ' "			° ' "			° ' "				
1	52	8	35.57	.07	15	54	59	41.51	.08	29	52	36	45.88	.09	43	61	40	4.33	.04
2	53	38	59.87	.08	16	55	1	50.03	.07	30	58	57	32.95	.06	44	73	56	37.55	.04
3	73	17	31.03	.06	17	48	18	42.27	.15	31	58	54	30.12	.11	45	75	38	21.91	.11
4	63	3	0.36	.14	18	53	17	57.37	.15	32	62	2	23.20	.12	46	73	42	21.41	.05
5	53	3	30.48	.09	19	68	49	5.11	.05	33	62	55	47.09	.04	47	57	21	21.38	.14
6	49	55	8.47	.18	20	59	32	12.18	.04	34	65	3	10.22	.14	48	54	50	26.43	.05
7	66	25	35.77	.10	21	56	50	51.65	.09	35	56	2	20.53	.12	49	48	20	51.15	.04
8	59	15	12.67	.07	22	51	55	42.66	.11	36	54	44	50.90	.10	50	63	10	47.84	.05
9	68	39	16.84	.05	23	70	49	49.90	.06	37	66	17	36.86	.14	51	64	52	44.82	.08
10	62	41	15.86	.07	24	57	42	31.83	.29	38	70	1	53.59	.06	52	49	4	7.49	.05
11	54	2	12.28	.05	25	61	19	15.95	.06	39	55	52	14.03	.08	53	55	9	8.16	.15
12	77	56	16.64	.11	26	61	21	48.49	.07	40	57	58	56.84	.08	54	59	52	39.96	.06
13	54	15	43.97	.11	27	63	38	30.32	.14	41	55	17	31.19	.12					
14	54	29	52.38	.11	28	63	50	17.57	.10	42	55	14	35.86	.10					

Equations to be satisfied												Factor
$x_2$	$+x_3$	$+x_5$	..	..	..	..	..	..	..	..	..	$= e_1 = + 0.78, \lambda_1$
$x_1$	$+x_6$	$+x_{13}$	..	..	..	..	..	..	..	..	..	$= e_2 = + .13, \lambda_2$
$x_7$	$+x_{11}$	$+x_{20}$	..	..	..	..	..	..	..	..	..	$= e_3 = - .27, \lambda_3$
$x_8$	$+x_{19}$	$+x_{23}$	..	..	..	..	..	..	..	..	..	$= e_4 = - .08, \lambda_4$
$x_{18}$	$+x_{23}$	$+x_{39}$	..	..	..	..	..	..	..	..	..	$= e_5 = + .74, \lambda_5$
$x_{17}$	$+x_{40}$	$+x_{46}$	..	..	..	..	..	..	..	..	..	$= e_6 = - .01, \lambda_6$
$x_{41}$	$+x_{45}$	$+x_{53}$	..	..	..	..	..	..	..	..	..	$= e_7 = + .08, \lambda_7$
$x_{42}$	$+x_{61}$	$+x_{64}$	..	..	..	..	..	..	..	..	..	$= e_8 = - .04, \lambda_8$
$x_9$	$+x_{21}$	$+x_{14}$	..	..	..	..	..	..	..	..	..	$= e_9 = + .18, \lambda_9$
$x_{15}$	$+x_{26}$	$+x_{27}$	..	..	..	..	..	..	..	..	..	$= e_{10} = - .44, \lambda_{10}$
$x_{16}$	$+x_{32}$	$+x_{33}$	..	..	..	..	..	..	..	..	..	$= e_{11} = - .42, \lambda_{11}$
$x_{31}$	$+x_{34}$	$+x_{35}$	..	..	..	..	..	..	..	..	..	$= e_{12} = + .15, \lambda_{12}$
$x_{30}$	$+x_{36}$	$+x_{37}$	..	..	..	..	..	..	..	..	..	$= e_{13} = + .01, \lambda_{13}$
$x_{29}$	$+x_{38}$	$+x_{47}$	..	..	..	..	..	..	..	..	..	$= e_{14} = + .20, \lambda_{14}$
$x_4$	$+x_{10}$	$+x_{13}$	..	..	..	..	..	..	..	..	..	$= e_{15} = - .43, \lambda_{15}$
$x_{25}$	$+x_{28}$	$+x_{48}$	..	..	..	..	..	..	..	..	..	$= e_{16} = - .81, \lambda_{16}$
$x_{24}$	$+x_{49}$	$+x_{44}$	..	..	..	..	..	..	..	..	..	$= e_{17} = - .09, \lambda_{17}$
$x_{43}$	$+x_{50}$	$+x_{53}$	..	..	..	..	..	..	..	..	..	$= e_{18} = - .37, \lambda_{18}$
$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	..	..	..	..	..	..	$= e_{19} = + .09, \lambda_{19}$
$x_{21}$	$+x_{22}$	$+x_{23}$	$+x_{24}$	$+x_{25}$	$+x_{26}$	..	..	..	..	..	..	$= e_{20} = + .48, \lambda_{20}$
$x_{27}$	$+x_{28}$	$+x_{29}$	$+x_{30}$	$+x_{31}$	$+x_{32}$	..	..	..	..	..	..	$= e_{21} = + .04, \lambda_{21}$
$x_{39}$	$+x_{40}$	$+x_{41}$	$+x_{42}$	$+x_{43}$	$+x_{44}$	..	..	..	..	..	..	$= e_{22} = - .20, \lambda_{22}$
$.30x_3$	$-.74x_2$	$+.78x_1$	$-.21x_{12}$	$+.73x_{11}$	$-.59x_{20}$	$+.39x_{19}$	$-.78x_{22}$	$+.65x_{21}$	$-.71x_{14}$	$+.72x_{13}$	$-.51x_4$	$= e_{23} = - 2.04, \lambda_{23}$
$.71x_{14}$	$-.39x_9$	$+.59x_8$	$-.39x_{19}$	$+.75x_{18}$	$-.68x_{39}$	$+.29x_{44}$	$-.89x_{49}$	$+.70x_{48}$	$-.49x_{28}$	$+.50x_{27}$	$-.70x_{15}$	$= e_{24} = + 0.95, \lambda_{24}$
$.70x_{15}$	$-.55x_{26}$	$+.55x_{25}$	$-.70x_{48}$	$+.64x_{47}$	$-.36x_{38}$	$+.44x_{37}$	$-.71x_{36}$	$+.67x_{35}$	$-.47x_{34}$	$+.51x_{33}$	$-.70x_{16}$	$= e_{25} = - 2.80, \lambda_{25}$
$.35x_{23}$	$-.75x_{18}$	$+.89x_{17}$	$-.29x_{46}$	$+.26x_{45}$	$-.87x_{53}$	$+.47x_{51}$	$-.58x_{54}$	$+.70x_{53}$	$-.51x_{50}$	$+.89x_{49}$	$-.63x_{24}$	$= e_{26} = - 0.67, \lambda_{26}$

PRINCIPAL TRIANGULATION—REDUCTION OF FIGURES.

Figure No. 64—(Continued.)

No. of e	Value of e	Equations between the factors												
		Co-efficients of												
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$	$\lambda_{13}$
1	+0 <sup>u</sup> .78	+·23												
2	·13		+·36											
3	-·27			+·19										
4	·08				+·23									
5	+·74					+·29								
6	-·01						+·28							
7	+·08							+·28						
8	-·04								+·24					
9	+·18									+·25				
10	-·44										+·29			
11	·42											+·23		
12	+·15					*							+·37	
13	·01													+·30
14	·20													
15	-·43													
16	·81													
17	·09													
18	·37													
19	+·09													
20	·48													
21	·04													
22	-·20													
23	2·04													
24	+·95													
25	-2·80													
26	0·67													

No. of e	Co-efficients of													
	$\lambda_{14}$	$\lambda_{15}$	$\lambda_{16}$	$\lambda_{17}$	$\lambda_{18}$	$\lambda_{19}$	$\lambda_{20}$	$\lambda_{21}$	$\lambda_{22}$	$\lambda_{23}$	$\lambda_{24}$	$\lambda_{25}$	$\lambda_{26}$	
1						+·09							-·0412	
2						·18							+·0315	
3						·10							·0129	
4						·07	+·11						-·0663	
5							·06			+·08			+·0218	
6										·08			·0581	
7										·12				
8										·10				
9						·05	·09				·0196	·0586		
10							·07	+·14				·0140	+·0175	
11								·12					-·0286	
12								·11					+·0146	
13								·06					-·0094	
14								·09					+·0680	
15	+·29					·07					+·0078			
16		+·32					·06	·10				-·0140	-·0020	
17			+·21									·0240	-·1471	
18				+·37			·29		·04				+·0795	
19					+·24				·04			+·0218		
20					*	+·56							·0055	
21							+·68					-·0273	-·1617	
22								+·62				·0210		
23									+·46			-·0428		
24												+·3986	·0631	
25													+·3743	
26														·0637
														+·3752
														·1161
														+·5312

Equations between the factors—(Continued.)

Figure No. 64—(Continued.)

Values of the Factors															
Factor	Symbolical														
	e <sub>1</sub>	e <sub>2</sub>	e <sub>3</sub>	e <sub>4</sub>	e <sub>5</sub>	e <sub>6</sub>	e <sub>7</sub>	e <sub>8</sub>	e <sub>9</sub>	e <sub>10</sub>	e <sub>11</sub>	e <sub>12</sub>	e <sub>13</sub>	e <sub>14</sub>	e <sub>15</sub>
λ <sub>1</sub> =	+ 4'9287	+ '5643	+ '6083	+ '6326	+ '0361	+ '0017	+ '0083	+ '0078	+ '3487	+ '0687	+ '0226	+ '0122	+ '0087	+ '0113	+ '2548
λ <sub>2</sub> =		3'5536	'8122	'5428	'0664	'0283	'0194	'0206	'3958	'0864	'0197	'0131	'0078	'0172	'3369
λ <sub>3</sub> =			6'1153	'5916	'0684	'0279	'0195	'0205	'4205	'0916	'0216	'0137	'0084	'0179	'3542
λ <sub>4</sub> =				5'9074	'4926	'2183	'1435	'1557	1'0900	'6296	'1396	'0948	'0557	'1261	'2491
λ <sub>5</sub> =					4'2631	'0714	'5197	'4666	'4855	'3028	'0400	'0390	'0176	'0703	'0279
λ <sub>6</sub> =						4'4743	'3964	'4736	'2839	'1368	- '0032	'0129	'0011	'0393	'0111
λ <sub>7</sub> =							4'2000	'6079	'1518	'0886	+ '0086	'0107	'0043	'0218	'0079
λ <sub>8</sub> =								4'7671	'1725	'0971	'0071	'0113	'0038	'0250	'0083
λ <sub>9</sub> =									4'9340	'5136	'0776	'0688	'0336	'1160	'1752
λ <sub>10</sub> =										4'4817	'7421	'4583	'2893	'5400	'0379
λ <sub>11</sub> =											5'1435	'4200	'3000	'3796	'0091
λ <sub>12</sub> =												2'9589	'1635	'2973	'0059
λ <sub>13</sub> =													3'4470	'1573	'0033
λ <sub>14</sub> =														3'9000	'0072
λ <sub>15</sub> =															3'2722
λ <sub>16</sub> =															
λ <sub>17</sub> =															
λ <sub>18</sub> =															
λ <sub>19</sub> =															
λ <sub>20</sub> =															
λ <sub>21</sub> =															
λ <sub>22</sub> =															
λ <sub>23</sub> =															
λ <sub>24</sub> =															
λ <sub>25</sub> =															

Factor	Symbolical											Numerical	Logarithmic	
	e <sub>16</sub>	e <sub>17</sub>	e <sub>18</sub>	e <sub>19</sub>	e <sub>20</sub>	e <sub>21</sub>	e <sub>22</sub>	e <sub>23</sub>	e <sub>24</sub>	e <sub>25</sub>	e <sub>26</sub>			
λ <sub>1</sub> =	+ '0887	+ '1835	+ '0000	- 1'2273	- '2200	- '0417	- '0183	+ '5609	+ '0861	+ '0078	+ '0087	+ 2'2538	0'3529154	
λ <sub>2</sub> =	'0908	'1925	'0192	1'5214	'2603	'0419	'0489	- '1711	- '0483	- '0175	- '0339	'5975	1'7763379	
λ <sub>3</sub> =	'0974	'2058	'0189	1'6053	'2753	'0447	'0495	'1121	'0384	'0163	'0321	- 1'3015	0'1144442	
λ <sub>4</sub> =	'6526	1'3865	'1491	1'2322	1'8874	'3013	'3674	+ '8387	'4191	'1391	'2652	3'1146	0'4934023	
λ <sub>5</sub> =	'2521	'9883	- '0079	'1214	'8566	'1131	1'1393	- '0638	'6728	'1507	+ '5972	+ 2'1232	0'3269909	
λ <sub>6</sub> =	'0650	- '2057	+ '6421	'0421	'3450	'0261	1'0979	'0839	'6725	'1332	- 1'3864	'6076	1'7836535	
λ <sub>7</sub> =	'0664	+ '3529	'2271	'0336	'2443	'0293	1'4614	'0268	'2529	'0539	+ '0493	'6057	1'7822934	
λ <sub>8</sub> =	'0675	'3821	'2888	'0350	'2625	'0292	1'4375	'0350	'3154	'0658	- '1475	'2037	1'3089697	
λ <sub>9</sub> =	'4406	'9752	'1984	'8192	1'4708	'2032	'4040	+ '1564	'9732	'2256	'3960	- '5085	1'7063080	
λ <sub>10</sub> =	1'0203	'8400	'0938	'1731	1'1486	'14983	'2279	'0041	'2776	'3197	'1679	2'5946	0'4140704	
λ <sub>11</sub> =	'7809	'2317	- '0035	'0443	'2726	1'4522	'0178	'0296	+ '1343	+ '3030	+ '0183	3'9359	0'5950441	
λ <sub>12</sub> =	'4500	'1373	+ '0086	'0276	'1773	'8414	'0268	'0070	'0030	- '1541	- '0127	+ '0981	2'9918461	
λ <sub>13</sub> =	'3003	'0897	'0003	'0173	'1077	'5587	'0093	'0097	'0407	+ '0677	+ '0037	- '6429	1'8081367	
λ <sub>14</sub> =	'4783	'1521	'0276	'0324	'2238	'9024	'0572	- '0097	- '1262	- '7331	- '0538	+ 1'9369	0'2871072	
λ <sub>15</sub> =	'0409	'0863	'0078	'6675	'1147	'0188	'0203	'0359	'0141	'0066	'0128	- 1'3146	0'1187936	
λ <sub>16</sub> =	5'8424	'9762	'0414	'1943	1'2324	1'5076	'1605	+ '0705	+ '1629	'0443	'0457	5'6643	0'7531462	
λ <sub>17</sub> =		5'2165	- '1995	'4084	2'6051	'4549	'7043	'1322	'2327	'0459	+ '9570	2'4376	0'3869624	
λ <sub>18</sub> =			+ '4'6300	'0279	'2346	'0163	'6625	- '0600	- '4833	'0954	- 1'0658	1'0886	0'0368683	
λ <sub>19</sub> =				+ 3'0691	+ '5320	+ '0900	+ '0837	'1487	+ '0092	+ '0197	+ '0426	+ '4619	1'6645574	
λ <sub>20</sub> =					3'4774	'5697	'6195	'0667	'4567	'1995	'3961	2'3940	0'3791241	
λ <sub>21</sub> =						2'8132	'0700	'0356	- '0980	'1254	'0146	2'1103	0'3243442	
λ <sub>22</sub> =								3'4432	+ '0804	+ '7261	'1519	'2676	- '8627	1'9358598
λ <sub>23</sub> =									2'8065	'4993	'0879	'1415	5'3410	0'7276226
λ <sub>24</sub> =										3'6093	'6672	1'0940	'6162	1'7897287
λ <sub>25</sub> =											2'9597	'2109	8'1122	0'9091386
λ <sub>26</sub> =												3'0824	'9338	1'9702306

Adopted angular errors in seconds

x <sub>1</sub> = -'25	x <sub>10</sub> = -'06	x <sub>19</sub> = -'25	x <sub>28</sub> = -'33	x <sub>37</sub> = -'59	x <sub>46</sub> = +'03
x <sub>2</sub> = +'50	x <sub>11</sub> = -'26	x <sub>20</sub> = +'07	x <sub>29</sub> = +'37	x <sub>38</sub> = +'29	x <sub>47</sub> = -'46
x <sub>3</sub> = +'04	x <sub>12</sub> = +'19	x <sub>21</sub> = -'14	x <sub>30</sub> = +'09	x <sub>39</sub> = +'15	x <sub>48</sub> = -'02
x <sub>4</sub> = +'20	x <sub>13</sub> = -'57	x <sub>22</sub> = +'38	x <sub>31</sub> = +'24	x <sub>40</sub> = -'02	x <sub>49</sub> = -'09
x <sub>5</sub> = +'24	x <sub>14</sub> = +'31	x <sub>23</sub> = +'25	x <sub>32</sub> = -'22	x <sub>41</sub> = -'03	x <sub>50</sub> = -'04
x <sub>6</sub> = +'10	x <sub>15</sub> = -'62	x <sub>24</sub> = +'15	x <sub>33</sub> = -'32	x <sub>42</sub> = -'07	x <sub>51</sub> = -'01
x <sub>7</sub> = -'08	x <sub>16</sub> = +'12	x <sub>25</sub> = -'46	x <sub>34</sub> = +'55	x <sub>43</sub> = -'08	x <sub>52</sub> = +'06
x <sub>8</sub> = -'21	x <sub>17</sub> = -'02	x <sub>26</sub> = +'30	x <sub>35</sub> = -'64	x <sub>44</sub> = -'15	x <sub>53</sub> = -'25
x <sub>9</sub> = +'01	x <sub>18</sub> = +'34	x <sub>27</sub> = -'12	x <sub>36</sub> = +'51	x <sub>45</sub> = +'05	x <sub>54</sub> = +'04

[wx<sup>2</sup>] = 47'07

Figure No. 65.

Observed Angles					Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_2$	$+ x_3$	$+ x_5$	$= e_1 = -1.41,$	$\lambda_1$					
	°	'	"		$x_1$	$+ x_6$	$+ x_{12}$	$= e_2 = -0.38,$	$\lambda_2$					
					$x_7$	$+ x_{11}$	$+ x_{16}$	$= e_3 = -0.45,$	$\lambda_3$					
					$x_8$	$+ x_{15}$	$+ x_{18}$	$= e_4 = -0.85,$	$\lambda_4$					
					$x_9$	$+ x_{14}$	$+ x_{17}$	$= e_5 = +0.68,$	$\lambda_5$					
					$x_4$	$+ x_{10}$	$+ x_{13}$	$= e_6 = +0.05,$	$\lambda_6$					
					$x_5$	$+ x_8$	$+ x_9$	$+ x_{10}$	$= e_7 = -0.09,$	$\lambda_7$				
					$\left. \begin{aligned} +.60x_3 - .58x_2 + .82x_1 - .64x_{12} + .38x_{11} - .62x_{16} \\ + .34x_{15} - .52x_{18} + .59x_{17} - .55x_{14} + .74x_{13} - .64x_4 \end{aligned} \right\} = e_8 = +0.57, \lambda_8$									
1	50	43	41.04	.08										
2	60	4	23.00	.09										
3	58	59	4.46	.12										
4	57	33	18.35	.13										
5	60	56	31.74	.19										
6	71	43	13.00	.08										
7	52	33	4.94	.11										
8	46	26	17.33	.16										
9	59	18	15.05	.14										
10	69	2	37.85	.09										
11	69	17	30.56	.08										
12	57	33	6.18	.09										
13	53	24	4.54	.17										
14	61	1	31.65	.19										
15	71	4	32.32	.06										
16	58	9	24.56	.06										
17	59	40	14.66	.10										
18	62	29	10.04	.11										
Equations between the factors														
					No. of e	Value of e	Co-efficients of							
							$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
					1	-1.41	+0.40						+0.19	+0.20
					2	-0.38		+0.25					+0.08	+0.08
					3	-0.45			+0.25				+0.11	-0.07
					4	-0.85				+0.33			+0.16	-0.37
					5	+0.68					+0.43		+0.14	-0.46
					6	+0.05			*			+0.39	+0.09	+0.43
					7	-0.09							+0.77	
					8	+0.57								+0.474
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+2.992	+0.332	+0.450	+0.490	+0.327	+0.246	-1.028	-0.080	-4.682	0.6704314				
$\lambda_2 =$		+4.223	+0.304	+0.331	+0.221	+0.166	-0.693	-0.050	-2.299	0.3615390				
$\lambda_3 =$			+4.424	+0.474	+0.321	+0.211	-0.957	+0.088	-2.779	0.4438885				
$\lambda_4 =$				+3.575	+0.375	+0.215	-1.060	+0.274	-3.551	0.5503507				
$\lambda_5 =$					+2.585	+0.137	-0.714	+0.253	+0.965	1.9845273				
$\lambda_6 =$			*			+2.703	-0.495	-0.226	-0.544	1.7355989				
$\lambda_7 =$							+2.171	-0.061	+2.304	0.3624825				
$\lambda_8 =$								+2.181	+1.269	0.1034616				
Adopted angular errors in seconds														
$x_1 = -0.09$	$x_4 = -0.18$	$x_7 = -0.06$	$x_{10} = +0.16$	$x_{13} = +0.07$	$x_{16} = -0.21$									
$x_2 = -0.50$	$x_5 = -0.45$	$x_8 = -0.20$	$x_{11} = -0.18$	$x_{14} = +0.05$	$x_{17} = +0.17$									
$x_3 = -0.46$	$x_6 = 0.00$	$x_9 = +0.46$	$x_{12} = -0.29$	$x_{15} = -0.19$	$x_{18} = -0.46$									
$[wx^2] = 12.88$														

Figure No. 66.

Observed Angles					Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_3$	$+x_3$	$+x_5$	$=e_1 = -$	$''$					
	o	'	''		$x_1$	$+x_6$	$+x_{13}$	$=e_2 = -$	$''$					
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = -$	$''$					
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = +$	$''$					
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = +$	$''$					
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = +$	$''$					
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$=e_7 = +$	$''$		
1	69	2	26.16	.12	$+ .36 x_3$	$- .67 x_2$	$+ .38 x_1$	$- .61 x_{12}$	$+ 1.25 x_{11}$	$- .54 x_{16}$	$= e_8 = -$	$''$	$\lambda_1$	
2	56	13	27.24	.10	$+ .17 x_{15}$	$- 1.19 x_{18}$	$+ 1.09 x_{17}$	$- .15 x_{14}$	$+ .48 x_{13}$	$- .67 x_4$	$= e_3 = -$	$''$	$\lambda_2$	
3	70	16	54.88	.09	Equations between the factors								$\lambda_3$	
4	56	7	6.48	.09									$\lambda_4$	
5	53	29	38.09	.10	Co-efficients of								$\lambda_5$	
6	52	15	15.41	.10									$\lambda_6$	
7	79	37	44.23	.09	No. of e	Value of e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
8	59	22	49.01	.15	1	- .25	+ .29					+ .10	- .035	
9	55	57	8.08	.12	2	- 1.48		+ .30				+ .10	- .003	
10	59	17	25.21	.14	3	- .35			+ .28			+ .09	+ .059	
11	38	46	1.24	.09	4	+ .09				+ .43		+ .15	- .183	
12	58	42	17.51	.08	5	+ .56					+ .43	+ .12	+ .151	
13	64	35	29.08	.07	6	+ .37		*				+ .30	+ .14	
14	81	38	7.82	.15	7	+ .03						+ .70		
15	80	29	41.21	.11	8	- 1.24							+ .766	
16	61	36	14.72	.10	Values of the Factors									
17	42	24	45.17	.16										
18	40	7	30.38	.17										

Factor	Symbolical								Numerical	Logarithmic
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$		
$\lambda_1 =$	+ 3.744	+ .261	+ .200	+ .369	+ .135	+ .382	- .776	+ .231	- 1.452	0.1619666
$\lambda_2 =$		+ 3.580	+ .226	+ .279	+ .188	+ .349	- .738	+ .050	- 5.267	0.7215633
$\lambda_3 =$			+ 3.859	+ .108	+ .302	+ .295	- .690	- .311	- 1.082	0.0342273
$\lambda_4 =$				+ 2.920	- .028	+ .444	- .815	+ .727	- 1.058	0.0244857
$\lambda_5 =$					+ 2.678	+ .225	- .583	- .542	+ 1.817	0.2593549
$\lambda_6 =$			*			+ 3.837	- 1.043	+ .188	+ .606	1.7824726
$\lambda_7 =$							+ 2.214	- .100	+ .932	1.9694159
$\lambda_8 =$								+ 1.625	- 2.209	0.3441957

Adopted angular errors in seconds

$x_1 = - .73$	$x_4 = + .18$	$x_7 = - .01$	$x_{10} = + .22$	$x_{13} = - .03$	$x_{16} = + .01$
$x_2 = .00$	$x_5 = - .05$	$x_8 = - .02$	$x_{11} = - .35$	$x_{14} = + .32$	$x_{17} = - .09$
$x_3 = - .20$	$x_6 = - .44$	$x_9 = + .33$	$x_{12} = - .31$	$x_{15} = - .16$	$x_{18} = + .27$

$[wx^2] = 12.46$

Figure No. 67.

Observed Angles					Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1 = -$	$\lambda_1$	$x_1$	$+x_6$	$+x_{13}$	$=e_2 = -$	$\lambda_2$
	°	'	"		$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = -$	$\lambda_3$	$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = +$	$\lambda_4$
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 =$	$\lambda_5$	$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = +$	$\lambda_6$
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$			$=e_7 = +$	$\lambda_7$
1	41	54	51.10	.07	$+ \cdot 13 x_3$	$- \cdot 86 x_2$	$+ \cdot 11 x_1$	$- \cdot 28 x_{13}$	$+ \cdot 30 x_{11}$	$- \cdot 76 x_{16}$			$=e_8 = +$	$\lambda_8$
2	49	20	51.31	.08	$+ \cdot 58 x_{15}$	$- \cdot 43 x_{18}$	$+ \cdot 88 x_{17}$	$- \cdot 66 x_{14}$	$+ \cdot 56 x_{13}$	$- \cdot 74 x_4$				
3	82	45	0.80	.17										
4	53	32	13.37	.09										
5	47	54	8.36	.10										
6	63	45	48.97	.10										
7	54	11	29.49	.14										
8	53	28	51.17	.14										
9	74	50	56.67	.17										
10	65	48	45.39	.13										
11	73	7	12.39	.12										
12	74	19	20.69	.13										
13	60	39	2.42	.05										
14	56	31	48.77	.05										
15	59	43	56.38	.13										
16	52	41	18.55	.11										
17	48	37	15.22	.19										
18	66	47	13.21	.08										
Equations between the factors														
							Co-efficients of							
					No. of e	Value of e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
1					1	- .23	+ .35						+ .10	- .047
2					2	- .01		+ .30					+ .10	+ .042
3					3	- .15			+ .37				+ .14	- .048
4					4	+ .11			+ .35				+ .14	+ .041
5					5	.00					+ .41		+ .17	+ .134
6					6	+ .57			*			+ .27	+ .13	- .039
7					7	+ .05							+ .78	
8					8	+ .90								+ .528
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+ 3.057	+ .159	+ .253	+ .204	+ .161	+ .316	- .583	+ .248	- .346	1.5390761				
$\lambda_2 =$		+ 3.627	+ .228	+ .334	+ .422	+ .298	- .729	- .365	- .266	1.4248816				
$\lambda_3 =$			+ 3.026	+ .285	+ .250	+ .407	- .779	+ .224	- .088	2.9444827				
$\lambda_4 =$				+ 3.242	+ .466	+ .370	- .867	- .326	+ .138	1.1398791				
$\lambda_5 =$					+ 3.086	+ .335	- .934	- .793	- .597	1.7759743				
$\lambda_6 =$				*		+ 4.217	- .995	+ .238	+ 2.472	0.3930485				
$\lambda_7 =$							+ 2.118	+ .168	- .147	1.1673173				
$\lambda_8 =$								+ 2.211	+ 2.011	0.3034121				
Adopted angular errors in seconds														
$x_1 = + .15$	$x_4 = + .08$	$x_7 = - .03$	$x_{10} = + .30$	$x_{13} = + .19$	$x_{16} = - .19$									
$x_2 = - .18$	$x_5 = - .05$	$x_8 = .00$	$x_{11} = + .07$	$x_{14} = - .10$	$x_{17} = + .23$									
$x_3 = .00$	$x_6 = - .04$	$x_9 = - .13$	$x_{12} = - .12$	$x_{15} = + .19$	$x_{18} = - .08$									
$[wx^2] = 3.32$														



Figure No. 68.

Observed Angles				Equations to be satisfied								Factor		
No.	Value			Reciprocal Weight	$x_2$	$+ x_3$	$+ x_5$	$= e_1 = -1.00,$	$\lambda_1$					
					$x_1$	$+ x_6$	$+ x_{12}$	$= e_2 = +1.33,$	$\lambda_2$					
					$x_7$	$+ x_{11}$	$+ x_{16}$	$= e_3 = -1.29,$	$\lambda_3$					
					$x_8$	$+ x_{15}$	$+ x_{18}$	$= e_4 = +.60,$	$\lambda_4$					
					$x_9$	$+ x_{14}$	$+ x_{17}$	$= e_5 = -.29,$	$\lambda_5$					
					$x_4$	$+ x_{10}$	$+ x_{18}$	$= e_6 = -.88,$	$\lambda_6$					
					$x_5$	$+ x_7$	$+ x_8$	$+ x_9$	$+ x_{10}$	$= e_7 = -.26,$	$\lambda_7$			
1	59	0	31.65	.08	$+ .58 x_3$	$- .55 x_2$	$+ .60 x_1$	$- .46 x_{12}$	$+ .46 x_{11}$	$- .74 x_{16}$	$= e_8 = +1.19,$	$\lambda_8$		
2	61	6	11.65	.08	$+ .51 x_{15}$	$- .78 x_{18}$	$+ .84 x_{17}$	$- .16 x_{14}$	$+ .62 x_{13}$	$- .80 x_4$				
Equations between the factors														
Co-efficients of														
					No. of e	Value of e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
					1	-1.00	+ .36						+ .16	+ .026
					2	+1.33		+ .27					+ .09	+ .002
					3	-1.29			+ .37				+ .19	- .061
					4	+ .60				+ .43			+ .15	- .102
					5	- .29					+ .46		+ .15	+ .171
					6	- .88			*			+ .36	+ .10	- .052
					7	- .26							+ .84	
					8	+1.19								+ .627
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+3.170	+ .289	+ .424	+ .273	+ .326	+ .223	- .864	- .119	-3.377	0.5285311				
$\lambda_2 =$		+3.920	+ .334	+ .227	+ .211	+ .181	- .650	+ .002	+4.581	0.6609603				
$\lambda_3 =$			+3.279	+ .434	+ .203	+ .330	-1.012	+ .341	-3.630	0.5599066				
$\lambda_4 =$				+2.679	+ .050	+ .261	- .693	+ .472	+1.574	0.1970047				
$\lambda_5 =$					+2.637	+ .071	- .620	- .701	-1.778	0.2499318				
$\lambda_6 =$			*			+2.972	- .550	+ .290	-2.399	0.3800302				
$\lambda_7 =$							+1.954	- .045	+ .991	1.9960737				
$\lambda_8 =$								+1.924	+2.214	0.3451776				
Adopted angular errors in seconds														
$x_1 = +.47$	$x_4 = -.64$	$x_7 = -.50$	$x_{10} = -.14$	$x_{13} = -.10$	$x_{16} = -.63$									
$x_2 = -.37$	$x_5 = -.38$	$x_8 = +.38$	$x_{11} = -.16$	$x_{14} = -.20$	$x_{17} = +.03$									
$x_3 = -.25$	$x_6 = +.50$	$x_9 = -.12$	$x_{12} = +.36$	$x_{15} = +.26$	$x_{18} = -.04$									
$[wx^2] = 20.09$														

Figure No. 69.

Observed Angles			Equations to be satisfied														Factor	
No.	Value	Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	...	...	...	...	...	...	...	...	...	...	$=e_1 = +0'80,$	$\lambda_1$	
1	65 56 0'48	'11	$x_1$	$+x_6$	$+x_{13}$	...	...	...	...	...	...	...	...	...	...	$=e_2 = +0'52,$	$\lambda_2$	
2	45 6 47'78	'07	$x_4$	$+x_{10}$	$+x_{14}$	...	...	...	...	...	...	...	...	...	...	$=e_3 = -1'05,$	$\lambda_3$	
3	64 12 55'14	'25	$x_9$	$+x_{15}$	$+x_{16}$	...	...	...	...	...	...	...	...	...	...	$=e_4 = +1'61,$	$\lambda_4$	
4	56 22 29'47	'09	$x_7$	$+x_{12}$	$+x_{20}$	...	...	...	...	...	...	...	...	...	...	$=e_5 = +0'94,$	$\lambda_5$	
5	70 40 18'56	'18	$x_{11}$	$+x_{21}$	$+x_{26}$	...	...	...	...	...	...	...	...	...	...	$=e_6 = +0'26,$	$\lambda_6$	
6	52 17 3'22	'13	$x_{22}$	$+x_{25}$	$+x_{28}$	...	...	...	...	...	...	...	...	...	...	$=e_7 = +0'16,$	$\lambda_7$	
7	62 43 48'36	'09	$x_{23}$	$+x_{27}$	$+x_{30}$	...	...	...	...	...	...	...	...	...	...	$=e_8 = +0'23,$	$\lambda_8$	
8	58 9 8'74	'11	$x_8$	$+x_{17}$	$+x_{19}$	...	...	...	...	...	...	...	...	...	...	$=e_9 = +0'83,$	$\lambda_9$	
9	56 4 36'39	'08	$x_{18}$	$+x_{24}$	$+x_{29}$	...	...	...	...	...	...	...	...	...	...	$=e_{10} = +0'60,$	$\lambda_{10}$	
10	60 5 5'00	'07	$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	...	...	...	...	...	...	...	$=e_{11} = +0'27,$	$\lambda_{11}$	
11	64 23 44'17	'11	$x_{19}$	$+x_{20}$	$+x_{21}$	$+x_{22}$	$+x_{23}$	$+x_{24}$	...	...	...	...	...	...	...	$=e_{12} = -0'58,$	$\lambda_{12}$	
12	49 1 24'40	'11	$.45x_1 - 1'00x_2 + .48x_3 - .67x_4 + .50x_{14} - .23x_{15} + .93x_{16} - .74x_{17} + .40x_{19} - .40x_{20} + .87x_{12} - .54x_{13} - .52x_7 - .62x_8 + .74x_{17} - .86x_{18} + .76x_{29} - .31x_{30} + .79x_{27} - .60x_{28} + .31x_{25} - .29x_{26} + .48x_{11} - .87x_{12}$													$=e_{13} = +0'29,$	$\lambda_{13}$	
13	61 46 57'57	'13														$=e_{14} = +0'71,$	$\lambda_{14}$	
Equations between the factors																		
		Co-efficients of																
		No. of e	Value of e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$	$\lambda_{13}$	$\lambda_{14}$	
1	2	1	+0'80	+0'50										+0'18		+0'5007		
2	3	2	+0'52		+0'37									+0'13		-0'207		
3	4	3	-1'05			+0'28								+0'07		+0'003		
4	5	4	+1'61				+0'29							+0'08		+0'1025		
5	6	5	+0'94					+0'29						+0'09	+0'097	-0'489		
6	7	6	+0'26						+0'36					+0'18	+0'597	+0'325		
7	8	7	+0'16							+0'50				+0'24		-0'1287		
8	9	8	+0'23								+0'35			+0'16		+0'149		
9	10	9	+0'83			*						+0'36		+0'11	+0'08	-0'0938	+0'576	
10	11	10	+0'60										+0'38	+0'66	+0'15		-0'196	
11	12	11	+0'27														+0'214	
12	13	12	-0'58												+0'90	-0'040		
13	14	13	+0'29													+0'5784	+0'164	
14	14	14	+0'71														+0'5516	
Values of the Factors																		
Factor	Symbolical														Numerical	Logarithmic		
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$	$e_{10}$	$e_{11}$	$e_{12}$	$e_{13}$	$e_{14}$				
$\lambda_1 =$	+2'3234	+2'776	+2'068	+3'162	+3'321	+0'428	+0'370	+0'374	+2'094	+0'324	-0'8292	-0'832	-2'475	-0'119	+1'1102	0'0454012		
$\lambda_2 =$		2'9841	'1975	'1938	'2490	'0408	'0278	'0331	'2814	'0284	'7899	'0758	+0'684	'0331	1'0565	0'0238695		
$\lambda_3 =$			3'7132	'1669	'1962	'0292	'0218	'0243	'1808	'0208	'5669	'0552	-0'296	'0183	-4'0309	0'6054020		
$\lambda_4 =$				3'8979	'3003	'0342	'0432	'0349	'0217	'0308	'6706	'0740	'7489	+0'296	6'1599	0'7895737		
$\lambda_5 =$					4'0934	'3283	'4626	'3537	'2069	'3116	'7863	'7336	'4900	'4285	3'9003	0'5910980		
$\lambda_6 =$						3'2694	'4498	'4414	'2606	'3800	'1173	'9716	'0056	-0'648	'3469	1'5402043		
$\lambda_7 =$							2'6538	'4920	'1353	'4345	'0876	1'0160	'0537	+0'6459	'5249	1'7200766		
$\lambda_8 =$								3'2857	'1067	'3729	'0981	'9185	'0225	'1982	'5195	1'7155856		
$\lambda_9 =$									3'2850	'7210	'4612	+0'5020	-0'3342	+2'5441	0'4055342			
$\lambda_{10} =$					*					2'9566	'0836	'7967	-0'215	+0'2017	1'6734	0'2235998		
$\lambda_{11} =$											+2'2678	+0'2215	+0'1267	'0718	1'1270	0'0519239		
$\lambda_{12} =$												1'9870	'0364	-0'2420	-0'4540	1'6570559		
$\lambda_{13} =$													2'0202	'1404	+0'8411	1'9248476		
$\lambda_{14} =$														+2'0582	-1'6425	0'2155061		
Adopted angular errors in seconds																		
$x_1 = +0'15$	$x_6 = +0'28$	$x_{11} = -0'13$	$x_{16} = -0'71$	$x_{21} = -0'14$	$x_{26} = +0'01$													
$x_2 = +0'03$	$x_7 = -0'33$	$x_{12} = -0'19$	$x_{17} = +0'12$	$x_{22} = -0'23$	$x_{27} = -0'07$													
$x_3 = +0'37$	$x_8 = +0'52$	$x_{13} = +0'09$	$x_{18} = +0'37$	$x_{23} = -0'16$	$x_{28} = +0'10$													
$x_4 = -0'41$	$x_9 = -0'40$	$x_{14} = -0'44$	$x_{19} = +0'19$	$x_{24} = +0'18$	$x_{29} = +0'05$													
$x_5 = +0'40$	$x_{10} = -0'20$	$x_{15} = -0'50$	$x_{20} = -0'42$	$x_{25} = -0'03$	$x_{30} = +0'00$													
$[wx^2] = 24'15$																		

Figure No. 70.

Observed Angles				Equations to be satisfied								Factor		
No.	Value			Reciprocal Weight	$x_2$	$+ x_3$	$+ x_5$	$= e_1 = +$	$''$	$\lambda_1$				
					$x_1$	$+ x_6$	$+ x_{12}$	$= e_2 = +$	$.84,$	$\lambda_2$				
					$x_7$	$+ x_{11}$	$+ x_{16}$	$= e_3 = -$	$.66,$	$\lambda_3$				
					$x_8$	$+ x_{15}$	$+ x_{18}$	$= e_4 = +$	$.92,$	$\lambda_4$				
					$x_9$	$+ x_{14}$	$+ x_{17}$	$= e_5 = -$	$.21,$	$\lambda_5$				
					$x_4$	$+ x_{10}$	$+ x_{13}$	$= e_6 = -$	$.44,$	$\lambda_6$				
					$x_5$	$+ x_6$	$+ x_7$	$+ x_8$	$+ x_9$	$+ x_{10}$	$= e_7 = .00,$	$\lambda_7$		
1	69	48	20.65	.16	$\left. \begin{aligned} &+ .54x_3 - .46x_2 + .37x_1 - .58x_{12} + .59x_{11} - .50x_{16} \\ &+ 1.20x_{15} - .44x_{18} + .58x_{17} - .88x_{14} + .29x_{13} - .78x_4 \end{aligned} \right\} = e_8 = + .52, \lambda_8$									
2	65	13	49.71	.11										
3	61	39	18.54	.17										
4	52	0	11.19	.07										
5	53	6	52.71	.17										
6	50	23	3.37	.13										
7	57	8	47.68	.16										
8	73	43	19.38	.13										
Equations between the factors														
9	71	28	53.54	.14	No. of e	Value of e	Co-efficients of							
10	54	9	3.32	.12			$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
11	59	34	25.92	.15	1	+ .23	+ .45						+ .17	+ .041
12	59	48	37.56	.12	2	+ .84		+ .41					+ .13	- .011
13	73	50	45.67	.04	3	- .66			+ .52				+ .16	- .016
14	48	33	17.57	.11	4	+ .92				+ .38			+ .13	+ .120
15	39	51	16.70	.14	5	- .21					+ .41		+ .14	- .004
16	63	16	46.58	.21	6	- .44			*			+ .23	+ .12	- .043
17	59	57	49.20	.16	7	.00							+ .85	
18	66	25	25.49	.11	8	+ .52								+ .650
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+ 2.506	+ .219	+ .212	+ .299	+ .239	+ .335	- .707	- .181	+ .604	$\bar{1}.7810369$				
$\lambda_2 =$		+ 2.625	+ .181	+ .193	+ .200	+ .309	- .585	+ .021	+ 2.146	0.3316297				
$\lambda_3 =$			+ 2.099	+ .185	+ .194	+ .302	- .568	+ .028	- 1.173	0.0692980				
$\lambda_4 =$				+ 3.032	+ .219	+ .240	- .658	- .554	+ 2.459	0.3907585				
$\lambda_5 =$					+ 2.654	+ .328	- .631	- .010	- .410	$\bar{1}.6127839$				
$\lambda_6 =$			*			+ 4.896	- .952	+ .272	- 1.724	0.2365373				
$\lambda_7 =$							+ 1.852	+ .077	- .293	$\bar{1}.4668676$				
$\lambda_8 =$								+ 1.670	+ .199	$\bar{1}.2988531$				
Adopted angular errors in seconds														
$x_1 = +.36$	$x_4 = -.13$	$x_7 = -.23$	$x_{10} = -.24$	$x_{13} = -.07$	$x_{16} = -.26$									
$x_2 = +.06$	$x_5 = +.05$	$x_8 = +.28$	$x_{11} = -.17$	$x_{14} = -.05$	$x_{17} = -.06$									
$x_3 = +.12$	$x_6 = +.24$	$x_9 = -.10$	$x_{12} = +.24$	$x_{15} = +.37$	$x_{18} = +.27$									
$[wx^2] = 5.93$														

Figure No. 71.

Observed Angles					Equations to be satisfied								Factor				
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1 = +$	$"$	$\lambda_1$							
					$x_1$	$+x_6$	$+x_{12}$	$=e_2 = -$	$\cdot 78,$	$\lambda_2$							
					$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = -$	$\cdot 40,$	$\lambda_3$							
					$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = +$	$\cdot 28,$	$\lambda_4$							
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = -$	$\cdot 19,$	$\lambda_5$							
					$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = +$	$\cdot 08,$	$\lambda_6$							
					$x_5$	$+x_8$	$+x_7$	$+x_3$	$+x_9$	$+x_{10}$	$=e_7 = +$	$\cdot 04,$					$\lambda_7$
1	57	44	6.09	.13	$+ \cdot 85 x_2$	$- \cdot 57 x_3$	$+ \cdot 63 x_1$	$- \cdot 53 x_{12}$	$+ \cdot 34 x_{11}$	$- \cdot 68 x_{16}$	$=e_8 = -$	$1 \cdot 09,$					$\lambda_8$
2	60	22	47.57	.14	$+ \cdot 74 x_{15}$	$- \cdot 63 x_{18}$	$+ \cdot 86 x_{17}$	$- \cdot 26 x_{14}$	$+ \cdot 13 x_{13}$	$- \cdot 99 x_4$							
Equations between the factors																	
Co-efficients of																	
		No. of e		Value of e													
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$				
1	55	12	55.21	.21	1	$+ \cdot 10$	$+ \cdot 37$					$+ \cdot 13$	$+ \cdot 005$				
2	68	47	12.73	.17	2	$- \cdot 78$		$+ \cdot 46$				$+ \cdot 21$	$+ \cdot 018$				
3	55	12	55.21	.21	3	$- \cdot 40$			$+ \cdot 38$			$+ \cdot 10$	$- \cdot 047$				
4	52	8	37.68	.14	4	$+ \cdot 28$				$+ \cdot 48$		$+ \cdot 17$	$+ \cdot 023$				
5	70	5	48.55	.13	5	$- \cdot 19$					$+ \cdot 38$	$+ \cdot 21$	$+ \cdot 090$				
6	60	19	30.87	.21	6	$+ \cdot 08$		*				$+ \cdot 34$	$+ \cdot 14$	$- \cdot 063$			
7	53	25	55.00	.10	7	$+ \cdot 04$						$+ \cdot 96$					
8	68	47	12.73	.17	8	$- 1 \cdot 09$								$+ \cdot 604$			

Values of the Factors										
Factor	Symbolical								Numerical	Logarithmic
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$		
$\lambda_1 =$	$+ 2 \cdot 925$	$+ \cdot 291$	$+ \cdot 159$	$+ \cdot 227$	$+ \cdot 363$	$+ \cdot 249$	$- \cdot 632$	$- \cdot 059$	$+ \cdot 055$	$2 \cdot 7403627$
$\lambda_2 =$		$+ 2 \cdot 555$	$+ \cdot 203$	$+ \cdot 297$	$+ \cdot 483$	$+ \cdot 319$	$- \cdot 825$	$- \cdot 113$	$- 1 \cdot 938$	$0 \cdot 2873538$
$\lambda_3 =$			$+ 2 \cdot 777$	$+ \cdot 154$	$+ \cdot 208$	$+ \cdot 226$	$- \cdot 461$	$+ \cdot 196$	$- 1 \cdot 464$	$0 \cdot 1655411$
$\lambda_4 =$				$+ 2 \cdot 316$	$+ \cdot 383$	$+ \cdot 242$	$- \cdot 641$	$- \cdot 119$	$+ \cdot 429$	$1 \cdot 6324573$
$\lambda_5 =$					$+ 3 \cdot 306$	$+ \cdot 331$	$- 1 \cdot 016$	$- \cdot 475$	$- \cdot 441$	$1 \cdot 6444386$
$\lambda_6 =$				*		$+ 3 \cdot 293$	$- \cdot 723$	$+ \cdot 290$	$- \cdot 391$	$1 \cdot 5921768$
$\lambda_7 =$							$+ 1 \cdot 797$	$+ \cdot 096$	$+ \cdot 688$	$1 \cdot 8375884$
$\lambda_8 =$								$+ 1 \cdot 781$	$- 1 \cdot 854$	$0 \cdot 2681097$

Adopted angular errors in seconds										
$x_1 = - \cdot 39$	$x_4 = + \cdot 12$	$x_7 = - \cdot 08$	$x_{10} = + \cdot 04$	$x_{13} = - \cdot 08$	$x_{16} = - \cdot 04$					
$x_2 = + \cdot 14$	$x_5 = + \cdot 10$	$x_8 = + \cdot 19$	$x_{11} = - \cdot 28$	$x_{14} = \cdot 00$	$x_{17} = - \cdot 24$					
$x_3 = - \cdot 14$	$x_6 = - \cdot 26$	$x_9 = + \cdot 05$	$x_{12} = - \cdot 13$	$x_{15} = - \cdot 15$	$x_{18} = + \cdot 24$					
$[wx^2] = 4 \cdot 32$										

Figure No. 72.

Observed Angles				Equations to be satisfied						Factor			
No.	Value			Reciprocal Weight	$x_2$	$+ x_3$	$+ x_5$	$= e_1 = -$	"	$\lambda_1$			
					$x_1$	$+ x_6$	$+ x_{12}$	$= e_2 = +$	$.11,$	$\lambda_2$			
					$x_7$	$+ x_{11}$	$+ x_{16}$	$= e_3 = -$	$.54,$	$\lambda_3$			
					$x_8$	$+ x_{15}$	$+ x_{18}$	$= e_4 = -$	$.83,$	$\lambda_4$			
					$x_9$	$+ x_{14}$	$+ x_{17}$	$= e_5 = -$	$.29,$	$\lambda_5$			
					$x_4$	$+ x_{10}$	$+ x_{13}$	$= e_6 = -$	$.09,$	$\lambda_6$			
					$x_5$	$+ x_8$	$+ x_9$	$+ x_{10}$	$= e_7 = -$	$.42,$	$\lambda_7$		
1	49	44	44.09	.16	$+ .85 x_3$	$- .42 x_2$	$+ .85 x_1$	$- .45 x_{12}$	$+ .44 x_{11}$	$- 1.01 x_{16}$	} $= e_8 = - 1.90,$	$\lambda_8$	
2	67	14	3.36	.08	$+ .64 x_{15}$	$- .77 x_{18}$	$+ .59 x_{17}$	$- .29 x_{14}$	$+ .23 x_{13}$	$- .67 x_4$			
3	49	29	27.14	.14	Equations between the factors								
4	56	18	15.23	.21	Equations between the factors								
5	63	16	29.95	.14	Equations between the factors								
6	64	23	13.24	.14	Equations between the factors								
7	68	58	48.74	.08	Equations between the factors								
8	70	15	56.98	.17	Equations between the factors								
9	46	34	37.10	.13	Equations between the factors								
10	46	30	53.57	.16	Equations between the factors								
11	66	10	12.97	.05	Equations between the factors								
12	65	52	3.33	.14	Equations between the factors								
13	77	10	51.78	.13	Equations between the factors								
14	73	57	31.45	.09	Equations between the factors								
15	57	24	35.08	.10	Equations between the factors								
16	44	50	58.37	.19	Equations between the factors								
17	59	27	51.80	.17	Equations between the factors								
18	52	19	27.98	.16	Equations between the factors								
Equations between the factors													
						Co-efficients of							
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
						1							
						2							
						3							
						4							
						5							
						6							
						7							
						8							
Values of the Factors													
Factor	Symbolical								Numerical	Logarithmic			
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$					
$\lambda_1 =$	$+ 3.140$	$+ .286$	$- .020$	$+ .228$	$+ .305$	$+ .144$	$- .706$	$- .370$	$- .348$	$\bar{1}.5415792$			
$\lambda_2 =$		$+ 2.500$	$+ .008$	$+ .193$	$+ .242$	$+ .128$	$- .579$	$- .257$	$+ .660$	$\bar{1}.8195439$			
$\lambda_3 =$			$+ 3.730$	$+ .321$	$- .006$	$+ .360$	$- .498$	$+ .905$	$- 3.814$	$0.5813807$			
$\lambda_4 =$				$+ 2.653$	$+ .198$	$+ .294$	$- .741$	$+ .255$	$- 2.691$	$0.4299137$			
$\lambda_5 =$			*		$+ 2.822$	$+ .128$	$- .605$	$- .296$	$- .255$	$\bar{1}.4065402$			
$\lambda_6 =$						$+ 2.282$	$- .608$	$+ .392$	$- 1.207$	$0.0817073$			
$\lambda_7 =$							$+ 1.854$	$- .065$	$+ .642$	$\bar{1}.8075350$			
$\lambda_8 =$								$+ 1.674$	$- 3.702$	$0.5684364$			
Adopted angular errors in seconds													
$x_1 = - .41$	$x_2 = + .27$	$x_7 = - .25$	$x_{10} = - .09$	$x_{18} = - .27$	$x_{16} = - .01$								
$x_3 = + .11$	$x_5 = + .04$	$x_8 = - .35$	$x_{11} = - .28$	$x_{14} = + .08$	$x_{17} = - .42$								
$x_4 = - .50$	$x_6 = + .18$	$x_9 = + .05$	$x_{12} = + .34$	$x_{15} = - .52$	$x_{18} = + .04$								
$[w x^2] = 11.43$													

Figure No. 73.

Observed Angles					Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_2$	$+x_3$	$+x_5$	$=e_1 = +.85,$	$\lambda_1$	$x_1$	$+x_6$	$+x_{12}$	$=e_2 = -2.55,$	$\lambda_2$
	°	'	"		$x_7$	$+x_{11}$	$+x_{16}$	$=e_3 = +.23,$	$\lambda_3$	$x_8$	$+x_{15}$	$+x_{18}$	$=e_4 = -.60,$	$\lambda_4$
					$x_9$	$+x_{14}$	$+x_{17}$	$=e_5 = +.92,$	$\lambda_5$	$x_4$	$+x_{10}$	$+x_{13}$	$=e_6 = -.33,$	$\lambda_6$
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$+x_{11}$	$+x_{12}$	$=e_7 = -.49,$	$\lambda_7$
1	51	18	47.82	.14	$+ .80 x_3$	$- .59 x_2$	$+ .80 x_1$	$- .33 x_{12}$	$+ .33 x_{11}$	$- .75 x_{16}$	$= e_8 = -1.09, \lambda_8$			
2	59	32	44.73	.13	$+ .72 x_{16}$	$- .68 x_{18}$	$+ .84 x_{17}$	$- .56 x_{14}$	$+ .00 x_{13}$	$- .85 x_4$				
3	51	27	39.12	.05										
4	49	47	24.57	.26										
5	68	59	37.88	.15										
6	56	49	8.82	.13										
7	54	56	55.60	.22										
8	69	41	51.30	.10										
9	69	4	3.38	.12										
10	40	28	22.53	.19										
11	71	58	36.94	.05										
12	71	52	1.40	.12										
13	89	44	13.09	.06										
14	60	53	13.62	.07										
15	54	23	42.71	.13										
16	53	4	28.25	.30										
17	50	2	44.57	.14										
18	55	54	26.15	.28										
Equations between the factors														
						Co-efficients of								
No. of e	Value of e				$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$		
1	+.85				+.33						+.15	-.037		
2	-2.55					+.39					+.13	+.072		
3	+.23						+.57				+.22	-.208		
4	-.60							+.51			+.10	-.096		
5	+.92								+.33		+.12	+.079		
6	-.33						*			+.51	+.19	-.221		
7	-.49										+.91			
8	-1.09												+.861	
Values of the Factors														
Factor	Symbolical								Numerical	Logarithmic				
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$						
$\lambda_1 =$	+3.473	+.223	+.477	+.243	+.230	+.491	-.880	+.377	+2.417	0.3832767				
$\lambda_2 =$		+2.773	+.144	+.072	+.235	+.125	-.533	-.170	-6.270	0.7972675				
$\lambda_3 =$			+2.368	+.314	+.129	+.655	-.860	+.771	-.122	1.0863598				
$\lambda_4 =$				+2.121	+.065	+.335	-.438	+.396	-1.445	0.1598678				
$\lambda_5 =$					+3.296	+.105	-.567	-.247	+3.132	0.4958218				
$\lambda_6 =$			*			+2.664	-.864	+.879	-1.269	0.1034616				
$\lambda_7 =$							+1.832	-.418	-.002	3.3010300				
$\lambda_8 =$								+1.671	-1.440	0.1583625				
Adopted angular errors in seconds														
$x_1 = -1.05$	$x_4 = -.01$	$x_7 = -.03$	$x_{10} = -.24$	$x_{13} = -.08$	$x_{16} = +.30$									
$x_2 = +.44$	$x_5 = +.36$	$x_8 = -.15$	$x_{11} = -.04$	$x_{14} = +.27$	$x_{17} = +.27$									
$x_3 = +.05$	$x_6 = -.81$	$x_9 = +.38$	$x_{12} = -.69$	$x_{15} = -.32$	$x_{18} = -.13$									
$[wx^2] = 23.76$														

Figure No. 74.

Observed Angles				Equations to be satisfied						Factor	
No.	Value			Reciprocal Weight					"		
	°	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$= e_1 = +.38,$	$\lambda_1$	
1	37	25	21.78	.07	$x_3$	$+x_4$	$-x_7$	$-x_8$	$= e_2 = +1.01,$	$\lambda_2$	
2	34	18	32.62	.12	$x_1$	$+x_2$	$+x_3$	$+x_4$	$= e_3 = -1.35,$	$\lambda_3$	
3	49	27	21.02	.12	$+x_5$	$+x_6$	$+x_7$	$+x_8$			
4	58	48	45.34	.29	$1.31 x_1$	$-1.47 x_2$	$+ .86 x_3$	$-.61 x_4$	$= e_4 = +1.52,$	$\lambda_4$	
5	36	46	1.67	.20	$+1.34 x_5$	$-1.43 x_6$	$+ .72 x_7$	$-.72 x_8$			
6	34	57	52.31	.13							
7	54	7	23.64	.09							
8	54	8	41.70	.12							

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	$+ .38$	$+ .52$		$-.14$	$-.166$	$\lambda_1 =$	$+2.0926$	$-.0704$	$+ .2934$	$+ .2836$	$+ .760$	$\bar{1}.8808136$
2	$+1.01$		$+ .62$	$+ .20$	$-.053$	$\lambda_2 =$		$+1.7151$	$-.3070$	$+ .0372$	$+2.176$	$0.3376589$
3	$-1.35$		*	$+1.14$	$-.097$	$\lambda_3 =$		*	$+ .9757$	$+ .0971$	$-1.364$	$0.1348144$
4	$+1.52$				$+1.311$	$\lambda_4 =$				$+ .8073$	$+1.242$	$0.0941216$

Adopted angular errors in seconds

$x_1 = + .07$	$x_5 = - .09$
$x_2 = - .28$	$x_6 = - .50$
$x_3 = + .22$	$x_7 = - .25$
$x_4 = + .01$	$x_8 = - .53$

$[wx^2] = 6.21$

Figure No. 75.

Observed Angles				Equations to be satisfied				Factor		
No.	Value			Reciprocal Weight						
	o	'	"		$x_1$	$+x_2$	$-x_5$	$-x_6$	$=e_1 = -.47,$	$\lambda_1$
					$x_3$	$+x_4$	$-x_7$	$-x_8$	$=e_2 = +.30,$	$\lambda_2$
1	42	18	17.70	.21	$x_1$	$+x_2$	$+x_3$	$+x_4$	$=e_3 = +.11,$	$\lambda_3$
2	38	50	10.04	.10	$+x_5$	$+x_6$	$+x_7$	$+x_8$		
3	45	45	46.39	.17	$1.10x_1$	$-1.24x_2$	$+ .97x_3$	$- .75x_4$	$=e_4 = +.33,$	$\lambda_4$
4	53	5	46.62	.14	$+1.38x_5$	$- .99x_6$	$+ .65x_7$	$-1.11x_8$		
5	35	59	48.27	.15						
6	45	8	39.83	.09						
7	56	55	57.39	.25						
8	41	55	35.23	.13						

Equations between the factors				Values of the Factors								
No. of e	Value of e	Co-efficients of				Factor	Symbolical				Numerical	Logarithmic
		$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$		$e_1$	$e_2$	$e_3$	$e_4$		
1	-.47	+ .55		+ .07	- .011	$\lambda_1 =$	+1.8337	- .0142	- .1147	- .0921	- .865	$\bar{1}.9370161$
2	+.30		+ .69	- .07	+ .041	$\lambda_2 =$		+1.4637	+ .1003	+ .0375	+ .434	$\bar{1}.6374897$
3	+.11			+1.24	+ .304	$\lambda_3 =$			+ .8701	+ .8559	+ .111	$\bar{1}.0453230$
4	+.33		*		+1.287	$\lambda_4 =$		*		+ .8292	+ .209	$\bar{1}.3201463$

Adopted angular errors in seconds

$x_1 = -.11$	$x_5 = +.19$
$x_2 = -.10$	$x_6 = +.07$
$x_3 = +.13$	$x_7 = -.05$
$x_4 = +.05$	$x_8 = -.07$

$[wx^2] = 0.62$



Figure No. 76.

Observed Angles				Equations to be satisfied													Factor		
No.	Value	Reciprocal Weight		$x_2$	$+x_3$	$+x_5$	...	...	...	...	...	...	...	...	...	$=e_1 = -$	$\lambda_1$		
1	86 31 7'24	.07		$x_1$	$+x_6$	$+x_{13}$	...	...	...	...	...	...	...	...	...	$=e_2 = -$	$\lambda_2$		
2	45 22 16'18	.10		$x_4$	$+x_{10}$	$+x_{14}$	...	...	...	...	...	...	...	...	...	$=e_3 = +$	$\lambda_3$		
3	87 27 33'53	.12		$x_9$	$+x_{15}$	$+x_{16}$	...	...	...	...	...	...	...	...	...	$=e_4 = -$	$\lambda_4$		
4	63 6 56'86	.09		$x_7$	$+x_{12}$	$+x_{20}$	...	...	...	...	...	...	...	...	...	$=e_5 = -$	$\lambda_5$		
5	47 10 10'57	.12		$x_{11}$	$+x_{21}$	$+x_{26}$	...	...	...	...	...	...	...	...	...	$=e_6 = +$	$\lambda_6$		
6	65 28 46'69	.20		$x_{22}$	$+x_{25}$	$+x_{28}$	...	...	...	...	...	...	...	...	...	$=e_7 = -$	$\lambda_7$		
7	57 6 22'54	.06		$x_{23}$	$+x_{27}$	$+x_{30}$	...	...	...	...	...	...	...	...	...	$=e_8 = -$	$\lambda_8$		
8	71 18 11'49	.13		$x_8$	$+x_{17}$	$+x_{19}$	...	...	...	...	...	...	...	...	...	$=e_9 = -$	$\lambda_9$		
9	57 3 47'66	.12		$x_{18}$	$+x_{24}$	$+x_{29}$	...	...	...	...	...	...	...	...	...	$=e_{10} = +$	$\lambda_{10}$		
10	61 52 40'74	.06		$x_5$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	...	...	...	...	...	...	...	$=e_{11} = -$	$\lambda_{11}$		
11	44 33 11'06	.06		$x_{19}$	$+x_{20}$	$+x_{21}$	$+x_{22}$	$+x_{23}$	$+x_{24}$	...	...	...	...	...	...	$=e_{12} = -$	$\lambda_{12}$		
12	60 23 40'86	.06		$\cdot 06x_1 - \cdot 99x_2 + \cdot 04x_3 - \cdot 51x_4 + \cdot 70x_{14} - \cdot 28x_{15} + \cdot 88x_{16} - \cdot 17x_{17} + \cdot 187x_{19} - \cdot 52x_{20} + \cdot 57x_{22} - \cdot 188x_{23}$ $\cdot 65x_7 - \cdot 34x_8 + \cdot 17x_{17} - \cdot 56x_{18} + \cdot 135x_{20} - \cdot 35x_{30} + \cdot 48x_{27} - \cdot 99x_{28} + \cdot 04x_{25} - \cdot 18x_{26} + \cdot 102x_{11} - \cdot 57x_{12}$													$=e_{13} = +$	$\lambda_{13}$	
13	28 0 8'21	.11															$=e_{14} = +$	$\lambda_{14}$	
14	55 0 23'17	.09		Equations between the factors															
15	74 23 4'05	.08		Co-efficients of															
16	48 33 9'83	.09		No. of e	Value of e	$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$	$\lambda_{13}$	$\lambda_{14}$
17	80 33 4'60	.06		1	- '38	+													
18	60 53 59'60	.05		2	- '29	+	+									+			
19	28 8 46'00	.08		3	+ '16		+												
20	62 30 1'10	.09		4	+ '73			+											
21	95 14 39'34	.06		5	- '16				+										
22	46 43 22'21	.06		6	+ '56					+									
23	44 48 25'14	.09		7	- '64						+								
24	82 34 46'08	.11		8	- '99							+							
25	87 52 39'83	.06		9	+ '38				*				+						
26	40 12 15'66	.07		10	+ '11									+					
27	64 32 59'71	.04		11	- '31										+				
28	45 24 3'45	.07		12	- '13											+			
29	36 31 21'74	.07		13	+ '19												+		
30	70 38 42'13	.08		14	+ '81													+	
Values of the Factors																			
Factor	Symbolical														Numerical	Logarithmic			
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$	$e_{10}$	$e_{11}$	$e_{12}$	$e_{13}$	$e_{14}$					
$\lambda_1 =$	+ 3'4235	+ '7756	+ '2156	+ '3203	+ '4500	+ '1050	+ '1135	+ '1388	+ '3362	+ '1435	- '9971	- '3209	+ '4709	+ '0344	- 2'2456	0'3513305			
$\lambda_2 =$		3'8929	'3163	'4561	'7076	'1711	'1839	'2261	'4411	'2339	1'5142	'5224	'8711	'0545	2'8672	0'4574640			
$\lambda_3 =$			4'3308	'2750	'2367	'0429	'0471	'0563	'3729	'0567	'6442	'1296	- '0421	'0179	+ '8085	1'9077015			
$\lambda_4 =$				3'9172	'3679	'0617	'0686	'0810	'6562	'0810	1'0486	'1862	'1797	'0276	3'0262	0'4808976			
$\lambda_5 =$					5'8152	'5452	'5467	'7400	'8524	'8243	1'0338	1'7262	+ '3067	'0048	- 2'1322	0'3288361			
$\lambda_6 =$						5'6568	'4668	'4995	'4132	'4542	'2053	1'1363	'1179	'3079	+ 2'3441	0'3699780			
$\lambda_7 =$							5'9468	'5337	'5005	'2921	'2237	1'1574	'1237	'9042	- 3'6768	0'5654747			
$\lambda_8 =$								5'4243	'5205	'6914	'2700	1'5324	'1576	'1419	5'6696	0'7535501			
$\lambda_9 =$									5'0074	'4585	1'3478	1'1789	- '5030	'3644	'3420	1'5339753			
$\lambda_{10} =$					*					5'3470	'2752	1'6800	+ '1678	- '6774	1'0014	0'0006033			
$\lambda_{11} =$											+ 2'6432	+ '6224	- '2312	'0784	+ '4348	1'6383095			
$\lambda_{12} =$												3'5663	'0878	2'3495	0'3709662				
$\lambda_{13} =$													+ 1'4056	+ '0245	- 3'5173	0'5462033			
$\lambda_{14} =$														2'4881	+ 1'2313	0'0903674			
Adopted angular errors in seconds																			
$x_1 = -$	'20	$x_6 = -$	'40	$x_{11} = +$	'23	$x_{16} = -$	'01	$x_{21} = +$	'28	$x_{26} = +$	'05								
$x_2 = +$	'12	$x_7 = -$	'06	$x_{12} = -$	'29	$x_{17} = +$	'03	$x_{22} = -$	'08	$x_{27} = -$	'20								
$x_3 = -$	'28	$x_8 = -$	'04	$x_{13} = +$	'40	$x_{18} = -$	'09	$x_{23} = -$	'30	$x_{28} = -$	'35								
$x_4 = +$	'23	$x_9 = +$	'42	$x_{14} = -$	'15	$x_{19} = -$	'37	$x_{24} = +$	'15	$x_{29} = +$	'05								
$x_5 = -$	'22	$x_{10} = +$	'08	$x_{15} = +$	'32	$x_{20} = +$	'19	$x_{25} = -$	'21	$x_{30} = -$	'49								
$[wx^2] = 21'94$																			

Figure No. 77.

Observed Angles				Equations to be satisfied													Factor									
No.	Value	Reciprocal Weight		$x_2$	$+x_3$	$+x_5$	...	...	...	...	...	...	...	...	...	...	...	$=e_1 = +0.11, \lambda_1$	$\lambda_1$							
1	50 18 16.59	.05		$x_1$	$+x_6$	$+x_{12}$	...	...	...	...	...	...	...	...	...	...	...	$=e_2 = -0.06, \lambda_2$	$\lambda_2$							
2	61 40 27.54	.05		$x_4$	$+x_9$	$+x_{13}$	...	...	...	...	...	...	...	...	...	...	...	$=e_3 = +0.07, \lambda_3$	$\lambda_3$							
3	49 21 14.29	.04		$x_7$	$+x_{11}$	$+x_{17}$	...	...	...	...	...	...	...	...	...	...	...	$=e_4 = 0.86, \lambda_4$	$\lambda_4$							
4	35 58 55.94	.04		$x_{10}$	$+x_{18}$	$+x_{25}$	...	...	...	...	...	...	...	...	...	...	...	$=e_5 = -0.94, \lambda_5$	$\lambda_5$							
5	68 58 23.00	.08		$x_{19}$	$+x_{24}$	$+x_{27}$	...	...	...	...	...	...	...	...	...	...	...	$=e_6 = +0.72, \lambda_6$	$\lambda_6$							
6	69 57 10.00	.04		$x_{20}$	$+x_{23}$	$+x_{26}$	...	...	...	...	...	...	...	...	...	...	...	$=e_7 = -0.37, \lambda_7$	$\lambda_7$							
7	56 35 22.73	.08		$x_8$	$+x_{14}$	$+x_{16}$	...	...	...	...	...	...	...	...	...	...	...	$=e_8 = 0.50, \lambda_8$	$\lambda_8$							
8	87 47 22.86	.07		$x_{15}$	$+x_{21}$	$+x_{22}$	...	...	...	...	...	...	...	...	...	...	...	$=e_9 = 0.47, \lambda_9$	$\lambda_9$							
9	76 41 41.11	.04		$x_5$	$+x_6$	$+x_8$	$+x_9$	...	...	...	...	...	...	...	...	...	...	$=e_{10} = 0.30, \lambda_{10}$	$\lambda_{10}$							
10	73 6 39.08	.03		$x_{16}$	$+x_{17}$	$+x_{18}$	$+x_{19}$	$+x_{20}$	$+x_{21}$	...	...	...	...	...	...	...	...	$=e_{11} = 0.25, \lambda_{11}$	$\lambda_{11}$							
11	47 50 26.84	.05		$\left. \begin{aligned} &.83x_1 - .54x_2 + .86x_3 - 1.38x_4 + .42x_{13} - 1.05x_{14} + .89x_{16} - .26x_{17} + .91x_{11} - .58x_{12} \\ &.66x_7 - .04x_8 + 1.05x_{14} - .47x_{15} + .43x_{22} - .62x_{23} + .66x_{26} - .22x_{27} + .91x_{24} - 1.50x_{25} \\ &\quad + .30x_{10} - .91x_{11} \end{aligned} \right\}$													$=e_{12} = 1.66, \lambda_{12}$	$\lambda_{12}$								
12	59 44 36.99	.06		Equations between the factors																						
13	67 19 26.65	.04		No. of e	Value of e	Co-efficients of																				
14	43 43 19.34	.08				$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$	$\lambda_9$	$\lambda_{10}$	$\lambda_{11}$	$\lambda_{12}$	$\lambda_{13}$								
15	64 47 35.68	.03		1	+.11	+.17							+.08			+.0074										
16	48 29 19.49	.05		2	-.06		+.15						.04			.0067										
17	75 34 13.50	.04		3	+.07			+.12					.04			-.0384										
18	73 12 38.47	.06		4	+.86				+.17				.08	+.04		+.0351	+.0073									
19	48 55 52.45	.05		5	-.94					+.14				.06		-.0660										
20	65 31 27.71	.04		6	+.72						+.17			.05		+.0577										
21	48 16 28.13	.07		7	-.37							+.16		.04		.0152										
22	66 55 58.83	.04		8	.50			*					+.20	.05		-.0395	.0812									
23	58 0 44.83	.05		9	.47									.07		.0031										
24	47 41 44.46	.07		10	.30									+.14	.07	.0500										
25	33 40 45.75	.05		11	.25										+.31	+.0341										
26	56 27 50.88	.07		12	1.66											+.3540	-.1296									
27	83 22 28.10	.05		13	+.29												+.4021									
Values of the Factors																										
Factor	Symbolical													Numerical	Logarithmic											
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$	$e_9$	$e_{10}$	$e_{11}$	$e_{12}$	$e_{13}$													
$\lambda_1 =$	+7.1200	+7.012	+8.771	+1.3406	+2.582	+0.924	+1.029	+9.847	+2.276	-2.6294	-4.612	+0.012	+1.276	+2.0814	0.3183556											
$\lambda_2 =$		+7.0660	.4713	.7700	.1287	.0580	.0580	.5487	.1240	1.4840	.2493	-.0713	.0460	.5537	1.7432745											
$\lambda_3 =$			9.3975	.7742	.4858	-.0275	.0825	.8542	.2550	1.9808	.5342	+1.2617	.5442	-.8716	1.9403172											
$\lambda_4 =$				7.6894	.5712	+5.488	.4206	1.3771	.8024	2.8012	1.5935	-.5012	-.2382	+7.4083	0.8697186											
$\lambda_5 =$					8.9179	.0743	.3971	.2507	1.0836	.6279	2.2429	+8.643	+1.7257	-.87495	0.9419832											
$\lambda_6 =$						6.7524	.5006	.8929	.7941	.1718	1.5329	-.2653	-1.2365	+4.7826	0.6796641											
$\lambda_7 =$							6.6088	.5488	.6606	.2219	1.3050	+0.244	.3444	-2.4147	0.3828632											
$\lambda_8 =$								6.7220	.9145	2.1325	1.7810	.4495	1.0870	2.2425	0.3507325											
$\lambda_9 =$					*				8.4500	.5093	2.6114	.2671	.0764	4.0538	0.6078623											
$\lambda_{10} =$										+5.6192	+1.0354	-.3351	.3910	2.3964	0.3795593											
$\lambda_{11} =$											5.2227	.5910	.0092	+1.5231	0.1827284											
$\lambda_{12} =$												+3.5939	+1.2954	-.70429	0.8477515											
$\lambda_{13} =$													3.6512	2.9324	0.4672232											
Adopted angular errors in seconds																										
$x_1 = -27$	$x_2 = +29$	$x_3 = -15$	$x_4 = +36$	$x_5 = -03$	$x_6 = -07$	$x_7 = +25$	$x_8 = -32$	$x_9 = -13$	$x_{10} = -28$	$x_{11} = +18$	$x_{12} = +28$	$x_{13} = -16$	$x_{14} = +17$	$x_{15} = -08$	$x_{16} = -35$	$x_{17} = +43$	$x_{18} = -43$	$x_{19} = +32$	$x_{20} = -04$	$x_{21} = -18$	$x_{22} = -21$	$x_{23} = -03$	$x_{24} = +16$	$x_{25} = -23$	$x_{26} = -30$	$x_{27} = +24$
$[wx^2] = 33.27$																										

Figure No. 78.—(Chach Base-line Figure.)

Observed Angles				Equations to be satisfied								Factor	
No.	Value			Reciprocal Weight	$x_1$	$+x_4$	$+x_5$	$= e_1 =$	"	$\lambda_1$			
	o	'	"		$x_3$	$+x_6$	$+x_{12}$	$= e_2 =$	·47,	$\lambda_2$			
					$x_7$	$+x_{11}$	$+x_{16}$	$= e_3 =$	+ ·49,	$\lambda_3$			
					$x_8$	$+x_{16}$	$+x_{18}$	$= e_4 =$	+ ·40,	$\lambda_4$			
					$x_9$	$+x_4$	$+x_{17}$	$= e_5 =$	+ ·12,	$\lambda_5$			
					$x_2$	$+x_{10}$	$+x_{13}$	$= e_6 =$	— ·58,	$\lambda_6$			
					$x_5$	$+x_6$	$+x_7$	$+x_8$	$+x_9$	$+x_{10}$	$= e_7 =$	— ·05,	$\lambda_7$
1	66	8	43·66	·24	$+·44x_1 - ·15x_4 + ·53x_3 - ·59x_{12} + ·27x_{11} - I·24x_{16}$ $+·62x_{15} - I·12x_{18} + I·11x_{17} - ·33x_{14} + ·91x_{13} - ·26x_2$					$= e_8 =$	— I·00,	$\lambda_8$	
2	75	12	33·94	·14									
3	62	8	56·66	·28									
4	81	30	20·05	·29									
5	32	20	56·97	·12									
6	58	11	35·16	·28									
7	66	20	54·14	·16									
8	79	50	10·91	·16									
9	66	6	4·76	·14									
10	57	10	18·01	·18									
11	74	47	46·61	·17									
12	59	39	28·74	·23									
13	47	37	8·99	·26									
14	71	50	46·33	·17									
15	58	17	0·46	·09									
16	38	51	21·48	·08									
17	42	3	12·10	·16									
18	41	52	52·70	·07									
Equations between the factors													
		No. of e		Value of e		Co-efficients of							
						$\lambda_1$	$\lambda_2$	$\lambda_3$	$\lambda_4$	$\lambda_5$	$\lambda_6$	$\lambda_7$	$\lambda_8$
		1		"00		+·65						+·12	+·062
		2		—·47			+·79					+·28	+·012
		3		+·49				+·41				+·16	—·053
		4		+·40					+·32			+·16	—·022
		5		+·12						+·47		+·14	+·122
		6		—·58				*			+·58	+·18	+·201
		7		—·05								+I·04	
		8		—I·00									+·910
Values of the Factors													
Factor	Symbolical								Numerical	Logarithmic			
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$					
$\lambda_1 =$	+I·606	+·105	+·094	+·135	+·125	+·142	—·290	—·149	+·147	I·1673173			
$\lambda_2 =$		+I·455	+·197	+·260	+·177	+·190	—·530	—·073	—·473	I·6748611			
$\lambda_3 =$			+2·672	+·288	+·140	+·138	—·562	+·105	+I·192	0·0762763			
$\lambda_4 =$				+3·493	+·216	+·224	—·735	+·012	+I·337	0·1261314			
$\lambda_5 =$					+2·370	+·281	—·484	—·377	+·594	I·7737864			
$\lambda_6 =$			*			+2·054	—·515	—·490	—·574	I·7589119			
$\lambda_7 =$							+I·491	+·152	—·306	I·4857214			
$\lambda_8 =$								+I·277	—·955	I·9800034			
Adopted angular errors in seconds													
$x_1 =$	—·08	$x_4 =$	+·09	$x_7 =$	+·14	$x_{10} =$	—·16	$x_{13} =$	—·37	$x_{16} =$	+·20		
$x_2 =$	—·05	$x_5 =$	—·01	$x_8 =$	+·16	$x_{11} =$	+·15	$x_{14} =$	+·16	$x_{17} =$	—·08		
$x_3 =$	—·28	$x_6 =$	—·22	$x_9 =$	+·04	$x_{12} =$	+·03	$x_{15} =$	+·07	$x_{18} =$	+·17		
$[wx^2] = 2·71$													

## PRINCIPAL TRIANGULATION. TRIANGLES.

### GREAT INDUS SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
333		(XX)	"	"	"	"	"	o' ' "			
		(XXI)	.16	— .21	— .164		— .374	55 39 53.656	4.7184473,0	52293.45	9.904
		(XXIII)	.16	— .72	— .038		— .758	86 45 8.302	4.8008991,1	63226.50	11.975
			.16	+ .24	+ .202		+ .442	37 34 58.042	4.5868608,9	38624.32	7.315
			.48				— .690	180 0 0.000			
332		(XXIII)	.32	— .35	— .075		— .425	63 50 14.675	4.8987555,7	79205.54	15.001
		(XXI)	.32	— .22	— .067		— .287	79 49 19.623	4.9388101,8	86858.07	16.450
		(XXV)	.32	+ .74	+ .142		+ .882	36 20 25.702	4.7184473,0	52293.45	9.904
			.96				— .170	180 0 0.000			
334		(XXI)	.48	— .71	— .011		— .721	66 34 37.969	4.9508025,6	89289.95	16.911
		(XXV)	.48	— .58	— .048		— .628	58 56 16.112	4.9209328,2	83355.22	15.787
		(XXIV)	.47	+ .02	+ .059		+ .079	54 29 5.919	4.8987555,7	79205.54	15.001
			1.43				— 1.270	180 0 0.000			
719		(XX)	.17	+ .49		— .292	+ .198	74 27 4.409	4.7816296,5	60482.49	11.455
		(XXI)	.17	+ .74		+ .039	+ .779	67 34 47.929	4.7636877,4	58034.70	10.991
		(XXII)	.17	— .13		+ .253	+ .123	37 58 7.662	4.5868608,9	38624.32	7.315
			.51				+ 1.100	180 0 0.000			
720		(XXI)	.34	+ .98		+ .067	+ 1.047	59 16 4.707	4.8683394,0	73848.11	13.986
		(XXII)	.35	+ .64		— .253	+ .387	75 59 0.877	4.9209328,2	83355.22	15.787
		(XXIV)	.34	+ .00		+ .186	+ .186	44 44 54.416	4.7816296,5	60482.49	11.455
			1.03				+ 1.620	180 0 0.000			

NOTES.—1. The values of the side are given in the same line with the opposite angle.  
 2. (XX), (XXI), (XXII), (XXIII), (XXIV) and (XXV) appertain to base-line figures.

GREAT INDUS SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
335		(XXV) (XXXIV) I	"	"	"	"	"	o' "			
			'44	+ '45	- '029		+ '421	51 46 11'691	4'8709063,2	74285'89	14'069
			'44	+ 1'32	+ '027		+ 1'347	57 27 44'097	4'9015891,5	79724'01	15'099
			'44	+ '23	+ '002		+ '232	70 46 4'212	4'9508025,6	89289'95	16'911
			1'32				+ 2'000	180 0 0'000			
336		(XXIV) I II	'50	- '14	- '014		- '154	53 43 27'976	4'9347021,2	86040'34	16'296
			'50	+ '03	- '026		+ '004	82 9 54'404	5'0241965,8	105729'60	20'025
			'50	- '07	+ '040		- '030	44 6 37'620	4'8709063,2	74285'89	14'069
			1'50				- 1'80	180 0 0'000			
337		I II IV	'50	+ '09	- '023		+ '067	78 30 37'617	5'0104401,9	102433'07	19'400
			'50	+ '08	+ '020		+ '100	46 5 23'090	4'8768213,6	75304'57	14'262
			'50	+ '31	+ '003		+ '313	55 23 59'293	4'9347021,2	86040'34	16'296
			1'50				+ '480	180 0 0'000			
338		II IV V	'82	- '32	- '011		- '331	55 56 1'029	5'0302657,8	107217'53	20'306
			'83	- '08	- '026		- '106	71 44 51'564	5'0896115,3	122916'88	23'280
			'82	- '64	+ '037		- '603	52 19 7'407	5'0104401,9	102433'07	19'400
			2'47				- 1'040	180 0 0'000			
339		IV V VI	'77	+ '17	- '026		+ '144	75 46 51'054	5'0935133,9	124026'19	23'490
			'77	- '15	+ '023		- '127	47 17 26'363	4'9731983,5	94015'26	17'806
			'77	+ '07	+ '003		+ '073	56 55 42'583	5'0302657,8	107217'53	20'306
			2'31				+ '090	180 0 0'000			
721		(XXV) I III	'57	- '07		- '058	- '128	57 49 35'852	4'9678094,3	92855'88	17'586
			'57	+ '02		+ '045	+ '065	75 33 35'935	5'0262718,8	106236'04	20'120
			'56	- '08		+ '013	- '067	46 36 48'213	4'9015891,5	79724'01	15'099
			1'70				- '130	180 0 0'000			
722		I III IV	'44	- '27		+ '002	- '268	52 59 45'382	4'8845354,2	76654'11	14'518
			'44	- '30		- '027	- '327	51 40 39'093	4'8768213,6	75304'57	14'262
			'44	- '40		+ '025	- '375	75 19 35'525	4'9678094,3	92855'88	17'586
			1'32				- '970	180 0 0'000			
723		III IV VI	'56	- '21		- '059	- '269	55 49 55'671	4'9731983,5	94015'26	17'806
			'57	- '17		+ '024	- '146	81 44 39'454	5'0509610,5	112450'41	21'297
			'56	- '30		+ '035	- '265	42 25 24'875	4'8845354,2	76654'11	14'518
			1'69				- '680	180 0 0'000			
340		V VI VII	'88	- '20	+ '003		- '197	88 33 2'063	5'1792869,7	151107'83	28'619
			'87	- '05	- '033		- '083	36 18 46'347	4'9518901,7	89513'84	16'953
			'87	- '29	+ '030		- '260	55 8 11'590	5'0935133,9	124026'19	23'490
			2'62				- '540	180 0 0'000			
341		VI VII VIII	'91	+ '15	- '044		+ '106	39 24 47'846	4'9824357,0	96036'36	18'189
			'92	+ '10	+ '043		+ '143	53 9 20'503	5'0829591,0	121048'41	22'926
			'92	+ '27	+ '001		+ '271	87 25 51'651	5'1792869,7	151107'83	28'619
			2'75				+ '520	180 0 0'000			
724		V VI VIII	1'14	- '04		+ '060	+ '020	51 14 29'210	5'0829591,0	121048'41	22'926
			1'15	+ '10		- '077	+ '023	75 43 34'823	5'1773625,3	150459'73	28'492
			1'15	+ '22		+ '017	+ '237	53 1 55'967	5'0935133,9	124026'19	23'490
			3'44				+ '280	180 0 0'000			

NOTE. (XXIV) and (XXV) appertain to base-line figures.

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
342		VIII	"	"	"	"	"	o' ' "			
		VII	.85	-.14	-.015		-.155	86 3 5'025	5'1524772,3	142061'77	26'906
		X	.84	-.11	+.009		-.101	51 32 23'899	5'0472945,6	111505'06	21'118
			.84	-.05	+.006		-.044	42 24 31'076	4'9824357,0	96036'36	18'189
			2'53				-.300	180 0 0'000			
343		VII	.94	-.31	-.018		-.328	31 20 35'402	4'9256135,3	84258'46	15'958
		X	.95	-.08	-.008		-.088	87 22 24'502	5'2090178,7	161814'66	30'647
		IX	.94	-.40	+.026		-.374	61 17 0'096	5'1524772,3	142061'77	26'906
			2'83				-.790	180 0 0'000			
725		VII	1'22	-.42		-.009	-.429	82 52 59'861	5'2495438,4	177641'26	33'644
		VIII	1'22	-.12		-.005	-.125	64 40 26'705	5'2090178,7	161814'66	30'647
		IX	1'21	-.32		+.014	-.306	32 26 33'434	4'9824357,0	96036'36	18'189
			3'65				-.860	180 0 0'000			
344		X	.58	+.43	-.018		+.412	68 32 17'172	5'0006159,0	100141'92	18'966
		IX	.58	+.01	+.013		+.023	59 55 16'553	4'9690098,8	93112'91	17'635
		XII	.57	+.08	+.005		+.085	51 32 26'275	4'9256135,3	84258'46	15'958
			1'73				+.520	180 0 0'000			
345		IX	.49	+.12	-.006		+.114	48 41 39'944	4'8881948,5	77302'73	14'641
		XII	.50	-.03	-.012		-.042	54 36 52'168	4'9237430,1	83896'34	15'889
		XI	.50	+.05	+.018		+.068	76 41 27'888	5'0006159,0	100141'92	18'966
			1'49				+.140	180 0 0'000			
726		IX	.53	+.13		+.007	+.137	108 36 57'037	5'1353536,2	136569'47	25'865
		X	.52	+.51		-.015	+.495	35 36 12'385	4'9237430,1	83896'34	15'889
		XI	.53	-.05		+.008	-.042	35 46 50'578	4'9256135,3	84258'46	15'958
			1'58				+.590	180 0 0'000			
346		XII	.45	-.00	-.020		-.020	63 26 8'480	4'9218746,0	83536'18	15'821
		XI	.44	+.02	+.016		+.036	60 42 7'496	4'9108866,7	81449'17	15'426
		XIV	.44	-.09	+.004		-.086	55 51 44'024	4'8881948,5	77302'73	14'641
			1'33				-.070	180 0 0'000			
347		XI	.43	+.05	-.005		+.045	54 6 56'075	4'8745036,5	74903'77	14'186
		XIV	.43	+.03	-.016		+.014	61 15 9'064	4'9087856,1	81056'08	15'352
		XIII	.44	+.22	+.021		+.241	64 37 54'861	4'9218746,0	83536'18	15'821
			1'30				+.300	180 0 0'000			
727		XI	.45	+.07		+.011	+.081	114 49 3'991	5'1252805,5	133438'32	25'272
		XII	.45	-.00		-.019	-.019	33 27 33'211	4'9087856,1	81056'08	15'352
		XIII	.45	+.22		+.008	+.228	31 43 22'798	4'8881948,5	77302'73	14'641
			1'35				+.290	180 0 0'000			
348		XIV	.36	-.12	-.035		-.155	73 48 35'845	4'9210527,0	83378'24	15'791
		XIII	.35	+.17	+.033		+.203	46 33 54'273	4'7996504,4	63045'84	11'941
		XVI	.36	-.27	+.002		-.268	59 37 29'882	4'8745036,5	74903'77	14'186
			1'07				-.220	180 0 0'000			
349		XIII	.29	+.09	-.012		+.078	46 8 3'758	4'7798885,4	60240'50	11'409
		XVI	.29	-.13	-.023		-.153	47 35 40'447	4'7902597,7	61696'39	11'685
		XV	.30	-.24	+.035		-.205	86 16 15'795	4'9210527,0	83378'24	15'791
			.88				-.280	180 0 0'000			

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No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
350	728	XIII	"	"	"	"	"	o' "			
		XIV	'37 + '26		+ '021	+ '281	92 41 58'30.1	4'9967694,2	99258'89	18'799	
		XV	'36 + '15		- '021	+ '129	38 22 49'69.9	4'7902597,7	61696.39	11'685	
			'36 + '01		- '000	+ '010	48 55 12'00.0	4'8745036,5	74903'77	14'186	
			1'09			+ '420	180 0 0'00.0				
		XVI	'28 + '38 - '017		+ '363	88 16 47'82.3	4'9135024,9	81941'23	15'519		
	351	729	XV	'27 + '26 + '012		+ '272	44 25 36'11.2	4'7587938,6	57384'40	10'868	
			XVIII	'27 + '15 + '005		+ '155	47 17 36'06.5	4'7798885,4	60240'50	11'409	
				'82		+ '790	180 0 0'00.0				
			XV	'33 + '40 - '011		+ '389	41 43 33'78.9	4'7558893,7	57001.91	10'796	
			XVIII	'33 + '05 - '012		+ '038	65 10 58'48.8	4'8906153,2	77734'77	14'722	
			XVII	'34 + '15 + '023		+ '173	73 5 27'72.3	4'9135024,9	81941'23	15'519	
352	730		1'00		+ '600	180 0 0'00.0					
		XV	'37 + '66		+ '001	+ '661	86 9 10'13.1	4'9781616,3	95095'86	18'011	
		XVI	'37 + '29		- '007	+ '283	54 38 46'01.3	4'8906153,2	77734'77	14'722	
		XVII	'37 + '09		+ '006	+ '096	39 12 3'85.6	4'7798885,4	60240'50	11'409	
			1'11		+ 1'040	180 0 0'00.0					
		XVIII	'26 - '14 - '024		- '164	63 11 29'68.6	4'8068873,0	64104'32	12'141		
	353	730	XVII	'26 - '05 + '018		- '032	64 16 55'48.8	4'8109660,4	64709'20	12'256	
			XX	'26 + '04 + '006		+ '046	52 31 34'82.6	4'7558893,7	57001'91	10'796	
				'78		- '150	180 0 0'00.0				
			XVII	'24 + '01 - '006		+ '004	54 17 15'28.4	4'7551384,1	56903'43	10'777	
			XX	'25 + '08 - '017		+ '063	59 32 53'89.3	4'7811412,4	60414'51	11'442	
			XIX	'25 + '01 + '023		+ '033	66 9 50'82.3	4'8068873,0	64104'32	12'141	
354	730		'74		+ '100	180 0 0'00.0					
		XVII	'24 - '04		+ '012	- '028	118 34 11'03.2	5'0041492,4	100959'98	19'121	
		XVIII	'24 - '08		- '018	- '098	31 42 15'78.2	4'7811412,4	60414'51	11'442	
		XIX	'23 - '08		+ '006	- '074	29 43 33'18.6	4'7558893,7	57001'91	10'796	
			'71		- '200	180 0 0'00.0					
		XIX	'30 + '11 - '008		+ '102	70 34 37'34.2	4'8659246,5	73438'64	13'909		
	355	730	XX	'29 + '30 - '048		+ '252	62 28 26'27.2	4'8391978,8	69055'44	13'079	
			XXI	'29 + '11 + '056		+ '166	46 56 56'38.6	4'7551384,1	56903'43	10'777	
				'88		+ '520	180 0 0'00.0				
			XX	'27 + '18 - '048		+ '132	55 30 21'14.2	4'7944231,0	62290'68	11'797	
			XXI	'27 + '23 + '047		+ '277	48 9 39'76.7	4'7505682,6	56307'76	10'664	
			XXIII	'27 + '58 + '001		+ '581	76 19 59'09.1	4'8659246,5	73438'64	13'909	
356	730		'81		+ '990	180 0 0'00.0					
		XXIII	'25 - '06 - '043		- '103	68 16 40'22.7	4'8202392,6	66105'75	12'520		
		XXI	'25 - '03 + '037		+ '007	50 37 57'55.7	4'7404614,1	55012'50	10'419		
		XXV	'25 + '19 + '006		+ '196	61 5 22'21.6	4'7944231,0	62290'68	11'797		
			'75		+ '100	180 0 0'00.0					
		XXI	'25 + '02 - '008		+ '012	60 49 26'82.2	4'7926730,5	62040'18	11'750		
	357	730	XXV	'25 - '15 - '036		- '186	50 41 14'30.4	4'7401679,8	54975'35	10'412	
			XXIV	'25 + '21 + '044		+ '254	68 29 18'87.4	4'8202392,6	66105'75	12'520	
				'75		+ '080	180 0 0'00.0				

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles	
358	731	XIX	.26	+ .16		+ .013	+ .173	49 30 41.333	4.7459979,6	55718.31	10.553	
		XXI	.26	+ .14		-.064	+ .076	59 59 54.636	4.8024022,9	63445.71	12.016	
		XXII	.27	+ .05		+ .051	+ .101	70 29 24.031	4.8391978,8	69055.44	13.079	
				.79				+ .350	180 0 0.000			
	732	XXI	.24	- .14		-.068	- .208	93 26 3.272	4.9062494,4	80584.11	15.262	
		XXII	.24	+ .06		+ .001	+ .061	42 55 14.551	4.7401679,8	54975.35	10.412	
		XXIV	.24	- .21		+ .067	- .143	43 38 42.177	4.7459979,6	55718.31	10.553	
				.72				- .290	180 0 0.000			
	359	XXIV	XXV	.23	- .07	-.016		- .086	53 21 48.334	4.7377879,8	54674.90	10.355
			XXV	.23	+ .23	-.033		+ .197	61 3 26.697	4.7754374,2	59626.24	11.293
			XXVI	.24	+ .29	+ .049		+ .339	65 34 44.969	4.7926730,5	62040.18	11.750
				.70				+ .450	180 0 0.000			
359	XXV	XXVI	.15	- .07	-.046		- .116	62 0 22.254	4.7036478,1	50541.46	9.572	
		XXVI	.15	+ .15	+ .044		+ .194	45 12 23.534	4.6087328,5	40619.34	7.693	
		XXVIII	.16	+ .06	+ .002		+ .062	72 47 14.212	4.7377879,8	54674.90	10.355	
			.46				+ .140	180 0 0.000				
360	XXVIII	XXVI	.16	- .11	-.044		- .154	68 12 48.266	4.7165881,4	52070.07	9.862	
		XXVI	.15	+ .03	+ .038		+ .068	47 27 19.458	4.6160931,0	41313.61	7.825	
		XXX	.15	+ .07	+ .006		+ .076	64 19 52.276	4.7036478,1	50541.46	9.572	
			.46				- .010	180 0 0.000				
361	XXVI	XXX	.18	+ .32	-.008		+ .312	65 42 15.032	4.7317179,6	53916.04	10.211	
		XXX	.17	+ .17	-.041		+ .129	52 37 33.539	4.6721908,9	47010.07	8.903	
		XXIX	.18	+ .23	+ .049		+ .279	61 40 11.429	4.7165881,4	52070.07	9.862	
			.53				+ .720	180 0 0.000				
733	XXIV	XXVI	.21	+ .33		+ .005	+ .335	56 52 48.415	4.7359073,7	54438.65	10.310	
		XXVI	.21	+ .21		-.062	+ .148	56 34 47.038	4.7344134,8	54251.72	10.275	
		XXVII	.22	+ .21		+ .057	+ .267	66 32 24.547	4.7754374,2	59626.24	11.293	
			.64				+ .750	180 0 0.000				
734	XXVI	XXVII	.20	- .27		-.061	- .331	79 28 28.839	4.8136085,8	65104.14	12.330	
		XXVII	.20	- .07		-.012	- .082	45 13 43.928	4.6721908,9	47010.07	8.903	
		XXIX	.20	- .37		+ .073	- .297	55 17 47.233	4.7359073,7	54438.65	10.310	
			.60				- .710	180 0 0.000				
362	XXX	XXIX	.21	+ .38	-.026		+ .354	63 57 36.404	4.7603749,3	57593.69	10.908	
		XXIX	.21	+ .10	+ .019		+ .119	58 46 54.429	4.7389297,9	54818.83	10.382	
		XXXI	.21	+ .07	+ .007		+ .077	57 15 29.167	4.7317179,6	53916.04	10.211	
			.63				+ .550	180 0 0.000				
363	XXIX	XXXI	.25	+ .09	-.008		+ .082	61 24 43.422	4.7849669,6	60949.05	11.543	
		XXXI	.25	- .18	-.020		- .200	62 30 55.950	4.7894212,9	61577.39	11.662	
		XXXII	.24	- .11	+ .028		- .082	56 4 20.628	4.7603749,3	57593.69	10.908	
			.74				- .200	180 0 0.000				
364	XXXI	XXXII	.22	+ .23	-.028		+ .202	55 9 48.482	4.7339810,8	54197.73	10.265	
		XXXII	.22	+ .39	+ .023		+ .413	57 27 48.703	4.7456045,2	55667.86	10.543	
		XXXV	.22	+ .01	+ .005		+ .015	67 22 22.815	4.7849669,6	60949.05	11.543	
			.66				+ .630	180 0 0.000				



No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
365		XXXII	"	"	"	"	"	o' "			
		XXXV	.16 - .07	-.027		-.097	34 55 49.963	4.5852649,5	38482.65	7.288	
		XXXVI	.17 - .18	-.013		-.193	91 19 22.957	4.8273106,6	67190.93	12.726	
			.16 - .06	+.040		-.020	53 44 47.080	4.7339810,8	54197.73	10.265	
			.49			-.310	180 0 0.000				
366		XXXV	.14 - .09	-.028		-.118	70 3 34.272	4.7106015,1	51357.22	9.727	
		XXXVI	.14 - .03	+.013		-.017	65 9 36.703	4.6952916,9	49578.31	9.390	
		XXXVII	.14 - .06	+.015		-.045	44 46 49.025	4.5852649,5	38482.65	7.288	
			.42			-.180	180 0 0.000				
735		XXX	.18 + .02		-.028	-.008	57 3 13.532	4.7032966,2	50500.61	9.565	
		XXXI	.18 + .03		+.036	+.066	57 18 39.256	4.7045536,1	50646.99	9.592	
		XXXIII	.19 + .37		-.008	+.362	65 38 7.212	4.7389297,9	54818.83	10.382	
			.55			+.420	180 0 0.000				
736		XXXI	.20 - .19		+.034	-.156	77 53 23.574	4.7982482,0	62841.74	11.902	
		XXXIII	.19 - .48		-.032	-.512	50 19 18.018	4.6943103,0	49466.40	9.369	
		XXXIV	.19 + .04		-.002	+.038	51 47 18.408	4.7032966,2	50500.61	9.565	
			.58			-.630	180 0 0.000				
737		XXXI	.16 - .11		-.029	-.139	49 51 42.351	4.6500359,8	44672.06	8.461	
		XXXIV	.17 - .03		+.005	-.025	72 18 3.775	4.7456045,2	55667.86	10.543	
		XXXV	.17 + .01		+.024	+.034	57 50 13.874	4.6943103,0	49466.40	9.369	
			.50			-.130	180 0 0.000				
738		XXXIV	.17 + .21		-.065	+.145	57 17 27.285	4.6952916,9	49578.31	9.390	
		XXXV	.17 + .12		+.012	+.132	73 24 25.212	4.7518037,5	56468.17	10.605	
		XXXVII	.16 + .23		+.053	+.283	49 18 7.503	4.6500359,8	44672.06	8.461	
			.50			+.560	180 0 0.000				
367		XXXVI	.22 - .08	-.005		-.085	75 50 18.425	4.8219006,5	66359.12	12.568	
		XXXVII	.22 + .01	-.026		-.016	55 32 8.704	4.7514835,0	56426.55	10.687	
		XXXVIII	.22 + .06	+.031		+.091	48 37 32.871	4.7106015,1	51357.22	9.727	
			.66			-.010	180 0 0.000				
368		XXXVII	.20 - .52	-.043		-.563	36 33 13.757	4.6160310,5	41307.70	7.823	
		XXXVIII	.20 - .03	+.031		+.001	70 21 16.411	4.8150472,4	65320.16	12.371	
		XL	.21 - .19	+.012		-.178	73 5 29.832	4.8219006,5	66359.12	12.568	
			.61			-.740	180 0 0.000				
369		XXXVIII	.16 - .06	-.014		-.074	61 23 41.446	4.7031898,5	50488.20	9.562	
		XL	.16 + .13	-.023		+.107	72 41 27.007	4.7395979,6	54903.24	10.398	
		XLII	.15 + .16	+.037		+.197	45 54 51.547	4.6160310,5	41307.70	7.823	
			.47			+.230	180 0 0.000				
370		XL	.21 - .52	-.031		-.551	62 14 24.629	4.7651815,5	58234.66	11.029	
		XLII	.22 - .01	+.016		+.006	67 39 25.486	4.7843902,0	60808.16	11.528	
		XLIV	.21 + .12	+.015		+.135	50 6 9.885	4.7031898,5	50488.20	9.562	
			.64			-.410	180 0 0.000				
371		XLII	.23 - .08	-.010		-.090	60 25 57.160	4.7660623,0	58352.88	11.052	
		XLIV	.23 - .06	-.019		-.079	59 20 19.971	4.7612538,8	57710.37	10.930	
		XLV	.23 + .11	+.029		+.139	60 13 42.869	4.7651815,5	58234.66	11.029	
			.69			-.030	180 0 0.000				

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
372		XLIV	"	"	"	"	"	o' "			
		XLV	'25	—'01	—'031		—'041	60 50 5'029	4'7877625,5	61342'65	11'618
		XLVI	'25	+ '03	+ '019		+ '049	62 59 55'019	4'7965165,3	62591'67	11'854
			'25	+ '29	+ '012		+ '302	56 9 59'052	4'7660623,0	58352'88	11'052
			'75				+ '310	180 0 0'000			
373		XLVI	'27	—'16	—'030		—'190	61 3 48'520	4'7976930,1	62761'46	11'887
		XLV	'26	—'23	+ '019		—'211	60 8 8'279	4'7937299,2	62191'34	11'779
		XLVIII	'26	+ '04	+ '011		+ '051	58 48 3'201	4'7877625,5	61342'65	11'618
			'79				—'350	180 0 0'000			
374		XLV	'22	+ '05	—'015		+ '035	49 32 45'965	4'7065090,1	50875'54	9'636
		XLVIII	'22	—'04	—'014		—'054	60 37 9'106	4'7653720,0	58260'20	11'034
		XLVII	'22	+ '08	+ '029		+ '109	69 50 4'929	4'7976930,1	62761'46	11'887
			'66				+ '090	180 0 0'000			
739		XXXVI	'16	—'22		—'028	—'248	48 49 32'042	4'6418998,0	43842'95	8'304
		XXXVIII	'16	—'03		—'002	—'032	55 32 11'328	4'6814564,8	48023'80	9'095
		XXXIX	'16	—'11		+ '030	—'080	75 38 16'630	4'7514835,0	56426'55	10'687
			'48				—'360	180 0 0'000			
740		XXXVIII	'17	+ '31		—'022	+ '288	64 16 37'798	4'7272500,1	53364'20	10'107
		XXXIX	'17	+ '04		—'024	+ '016	67 58 38'576	4'7396679,7	54912'09	10'400
		XLI	'17	—'18		+ '046	—'134	47 44 43'626	4'6418998,0	43842'95	8'304
			'51				+ '170	180 0 0'000			
741		XXXVIII	'20	+ '27		—'024	+ '246	59 48 39'036	4'7383888,9	54750'60	10'369
		XLI	'21	—'51		+ '012	—'498	60 5 11'602	4'7395979,6	54903'24	10'398
		XLII	'21	—'18		+ '012	—'168	60 6 9'362	4'7396679,7	54912'09	10'400
			'62				—'420	180 0 0'000			
742		XLI	'23	+ '11		—'016	+ '094	59 1 20'414	4'7685986,0	58694'66	11'116
		XLII	'24	—'03		—'028	—'058	67 52 15'032	4'8022003,3	63416'22	12'011
		XLIII	'23	—'20		+ '044	—'156	53 6 24'554	4'7383888,9	54750'60	10'369
			'70				—'120	180 0 0'000			
743		XLII	'22	+ '32		—'027	+ '293	58 1 20'143	4'7517456,6	56460'62	10'693
		XLIII	'23	+ '05		+ '034	+ '084	60 6 55'164	4'7612538,8	57710'37	10'930
		XLV	'23	—'40		—'007	—'407	61 51 44'693	4'7685986,0	58694'66	11'116
			'68				—'030	180 0 0'000			
744		XLIII	'24	+ '37		—'003	+ '367	58 47 25'177	4'7653720,0	58260'20	11'034
		XLV	'24	+ '10		—'045	+ '055	65 13 40'845	4'7913427,4	61850'43	11'714
		XLVII	'23	—'02		+ '048	+ '028	55 58 53'978	4'7517456,6	56460'62	10'693
			'71				+ '450	180 0 0'000			
375		XLVIII	'23	+ '38	—'105		+ '275	79 15 50'635	4'8421033,3	69518'97	13'166
		XLVII	'23	+ '10	+ '043		+ '143	54 45 46'493	4'7618731,2	57792'72	10'946
		XLIX	'22	+ '50	+ '062		+ '562	45 58 22'872	4'7065090,1	50875'54	9'636
			'68				+ '980	180 0 0'000			
376		XLVII	'25	+ '20	—'072		+ '128	46 29 35'258	4'7262876,5	53246'08	10'084
		XLIX	'26	—'30	—'049		—'349	62 15 10'121	4'8127233,6	64971'57	12'305
		L	'26	—'10	+ '121		+ '021	71 15 14'621	4'8421033,3	69518'97	13'166
			'77				—'200	180 0 0'000			

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No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
377		L XLIX LII	"	"	"	"	"	o' "			
			.21	+ .50	- .047		+ .453	61 27 47.623	4.7459265,2	55709.15	10.551
			.21	+ .21	- .084		+ .126	61 25 53.676	4.7457959,8	55692.41	10.548
			.20	+ .04	+ .131		+ .171	57 6 18.701	4.7262876,5	53246.08	10.084
			.62			+ .750	180 0 0.000				
378		XLIX LII LIII	.19	- .13	+ .129		- .259	58 0 38.591	4.7194600,9	52415.54	9.927
			.19	+ .49	+ .089		+ .579	57 38 27.709	4.7176972,1	52203.21	9.887
			.20	- .08	+ .040		- .040	64 20 53.700	4.7459265,2	55709.15	10.551
			.58				+ .280	180 0 0.000			
379		LII LIII LIV	.20	+ .11	- .054		+ .056	59 23 48.236	4.7278288,6	53435.37	10.120
			.20	+ .20	- .081		+ .119	63 0 27.899	4.7428812,7	55319.89	10.477
			.19	+ .04	+ .135		+ .175	57 35 43.865	4.7194600,9	52415.54	9.927
			.59				+ .350	180 0 0.000			
380		LIII LIV LVI	.19	- .53	- .136		- .666	58 14 11.444	4.7220246,3	52725.98	9.986
			.20	- .47	+ .082		- .388	62 15 32.882	4.7394627,1	54886.14	10.395
			.20	- .23	+ .054		- .176	59 30 15.674	4.7278288,6	53435.37	10.120
			.59				- 1.230	180 0 0.000			
381		LIV LVI LVIII	.19	- .07	- .057		- .127	58 43 43.353	4.7209167,1	52591.64	9.961
			.20	+ .10	- .077		+ .023	62 18 2.743	4.7362327,7	54479.46	10.318
			.19	- .25	+ .134		- .116	58 58 13.904	4.7220246,3	52725.98	9.986
			.58				- .220	180 0 0.000			
382		LVI LVIII LIX	.18	+ .10	- .132		- .032	58 51 1.798	4.7009883,1	50232.91	9.514
			.17	- .06	+ .086		+ .026	57 30 41.446	4.6946904,3	49509.72	9.377
			.18	- .34	+ .046		- .294	63 38 16.756	4.7209167,1	52591.64	9.961
			.53				- .300	180 0 0.000			
745		XLVIII XLIX LI	.21	- .16		- .178	- .338	47 54 54.302	4.6937913,9	49407.33	9.357
			.22	- .02		+ .214	+ .194	71 50 42.614	4.8011215,5	63258.89	11.981
			.21	+ .62		- .036	+ .584	60 14 23.084	4.7618731,2	57792.72	10.946
			.64				+ .440	180 0 0.000			
746		XLIX LI LIII	.18	- .25		- .024	- .274	60 29 10.846	4.7005688,6	51235.25	9.704
			.18	- .45		- .068	- .518	62 27 31.972	4.7176972,1	52203.21	9.887
			.17	+ .18		+ .092	+ .272	57 3 17.182	4.6937913,9	49407.33	9.357
			.53				- .520	180 0 0.000			
747		LI LIII LV	.22	- .12		- .201	- .321	75 9 46.729	4.8139692,6	65158.23	12.341
			.22	+ .04		+ .076	+ .116	55 21 49.416	4.7439783,0	55459.80	10.504
			.21	- .02		+ .125	+ .105	49 28 23.855	4.7095688,6	51235.25	9.704
			.65				- .100	180 0 0.000			
748		LIII LV LVI	.25	- .29		+ .009	- .281	61 59 19.129	4.7954712,9	62441.21	11.826
			.25	- .15		- .093	- .243	50 53 55.857	4.7394627,1	54886.14	10.395
			.25	+ .27		+ .084	+ .354	67 6 45.014	4.8139692,6	65158.23	12.341
			.75				- .170	180 0 0.000			
749		LV LVI LVII	.22	- .28		- .132	- .412	59 46 49.908	4.7580075,7	57280.60	10.849
			.21	+ .09		+ .031	+ .121	49 50 13.791	4.7046570,0	50659.05	9.595
			.22	- .08		+ .101	+ .021	70 22 56.301	4.7954712,9	62441.21	11.826
			.65				- .270	180 0 0.000			

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles	
383	750	LVI	"	"	"	"	"	o' ' "				
		LVII	.20	+ .29		+ .040	+ .330	62 23 39.740	4.7459622,8	55713.74	10.552	
		LIX	.19	- .11		- .175	- .285	51 57 2.165	4.6946904,3	49509.72	9.377	
			.20	+ .11		+ .135	+ .245	65 39 18.095	4.7580075,7	57280.60	10.849	
			.59				+ .290	180 0 0.000				
		LVIII	.20	- .15	- .047		- .197	60 34 35.723	4.7373664,5	54621.86	10.345	
	LIX	.20	+ .25	- .065		+ .185	66 11 42.835	4.7587277,9	57375.67	10.867		
	LX	.19	+ .38	+ .112		+ .492	53 13 41.442	4.7009883,1	50232.91	9.514		
		.59				+ .480	180 0 0.000					
	384	751	LIX	.21	- .61	- .113		- .723	55 47 24.067	4.7310318,0	53830.92	10.195
			LX	.22	+ .22	+ .060		+ .280	67 9 40.520	4.7780782,8	59989.92	11.362
			LXII	.21	+ .48	+ .053		+ .533	57 2 55.413	4.7373664,5	54621.86	10.345
			.64				+ .090	180 0 0.000				
LXII			.25	- .14	- .085		- .225	78 8 38.835	4.8543872,2	71513.37	13.544	
LX			.25	+ .17	+ .030		+ .200	54 24 23.010	4.7739311,1	59419.79	11.254	
LXV	.24	- .44	+ .055		- .385	47 26 58.155	4.7310318,0	53830.92	10.195			
	.74				- .410	180 0 0.000						
385	752	LX	.23	+ .28	- .047		+ .233	51 7 58.703	4.7503060,1	56273.77	10.658	
		LXV	.23	- .22	- .029		- .1249	47 11 35.591	4.7244776,9	53024.64	10.043	
		LXIII	.24	- .42	+ .076		- .344	81 40 25.706	4.8543872,2	71513.37	13.544	
			.70				- .1360	180 0 0.000				
		LVIII	.19	+ .24		- .307	+ .203	52 11 53.093	4.6901964,3	49000.04	9.280	
		LX	.19	+ .01		- .067	- .057	60 6 15.893	4.7304819,5	53762.81	10.182	
LXI	.20	- .27		+ .104	- .166	67 41 51.014	4.7587277,9	57375.67	10.867			
	.58				- .020	180 0 0.000						
387	752	LX	.20	+ .34		- .088	+ .252	73 57 59.152	4.7885943,4	61460.25	11.640	
		LXI	.20	+ .76		- .044	+ .716	56 0 54.746	4.7244776,9	53024.64	10.043	
		LXIII	.19	+ .00		+ .132	+ .132	50 1 6.102	4.6901964,3	49000.04	9.280	
			.59				+ .1100	180 0 0.000				
		LXIII	.22	- .16	- .024		- .184	74 12 52.606	4.8117173,3	64821.24	12.277	
		LXV	.21	- .38	- .073		- .453	49 7 41.077	4.7070344,2	50937.12	9.647	
LXVI	.22	+ .28	+ .097		+ .377	56 39 26.317	4.7503060,1	56273.77	10.658			
	.65				- .260	180 0 0.000						
388	752	LXV	.19	- .73	- .133		- .863	42 10 58.387	4.6447843,3	44135.12	8.359	
		LXVI	.19	+ .99	+ .100		+ .1090	57 20 10.180	4.7429743,3	55331.74	10.479	
		LXVIII	.19	- 2.01	+ .033		- 1.977	80 28 51.433	4.8117173,3	64821.24	12.277	
			.57				- 1.750	180 0 0.000				
		LXVIII	.17	- .23	- .094		- .324	72 40 15.866	4.7426296,0	55287.84	10.471	
		LXVI	.16	- .09	+ .036		- .054	57 41 2.606	4.6897182,3	48946.12	9.270	
LXX	.16	- .05	+ .058		+ .008	49 38 41.528	4.6447843,3	44135.12	8.359			
	.49				- .370	180 0 0.000						
389	752	LXVI	.17	+ .23	- .037		+ .193	60 51 17.513	4.7100314,6	51280.85	9.714	
		LXX	.16	- .14	- .049		- .189	48 50 43.781	4.6455828,5	44216.35	8.374	
		LXIX	.17	- .00	+ .086		+ .086	70 17 58.706	4.7426296,0	55287.84	10.471	
			.50				+ .090	180 0 0.000				

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles	
391	753	LXIII	.16	+ .09		-.056	+ .034	54 36 43'244	4'6599799,7	45706'71	8'657	
		LXVI	.16	+ .10		-.093	+ .007	60 5 0'237	4'6865845,8	48594'22	9'203	
		LXVII	.16	- .26		+ .149	- .111	65 18 16'519	4'7070344,2	50937'12	9'647	
				.48				- .070	180 0 0'000			
		754	LXVI	.15	+ .44		-.103	+ .337	67 23 2'097	4'6080849,9	49898'21	9'450
			LXVII	.14	+ .07		-.063	+ .007	54 53 2'497	4'6455828,5	44216'35	8'374
			LXIX	.15	- .29		+ .166	- .124	57 43 55'406	4'6599799,7	45706'71	8'657
				.44				- .220	180 0 0'000			
		392	LXIX	.20	- .50	-.093		- .593	53 38 59'077	4'7133659,6	51685'17	9'789
			LXX	.20	- .04	-.080		- .120	73 17 30'710	4'7886161,7	61463'34	11'641
			LXXI	.20	- .24	+ .173		- .067	53 3 30'213	4'7100314,6	51289'85	9'714
				.60				- .780	180 0 0'000			
	393	LXX	.21	- .20	-.146		- .346	63 2 59'804	4'7540441,1	56760'23	10'750	
		LXXI	.21	+ .06	+ .069		+ .129	62 41 15'779	4'7526371,9	56576'64	10'715	
		LXXIII	.20	+ .57	+ .077		+ .647	54 15 44'417	4'7133659,6	51685'17	9'789	
			.62				+ .430	180 0 0'000				
	394	LXXI	.23	- .01	-.049		- .059	68 39 16'551	4'8003422,7	63145'48	11'959	
		LXXIII	.23	- .31	-.094		- .404	54 29 51'746	4'7418782,5	55192'27	10'453	
		LXXV	.23	+ .14	+ .143		+ .283	56 50 51'703	4'7540441,1	56760'23	10'750	
			.69				- .180	180 0 0'000				
	494	LXXIII	.25	+ .62	-.158		+ .462	54 59 41'722	4'7613546,8	57723'77	10'933	
		LXXV	.25	- .30	+ .093		- .207	61 21 48'033	4'7913515,4	61851'69	11'714	
		LXXXI	.26	+ .12	+ .065		+ .185	63 38 30'245	4'8003422,7	63145'48	11'959	
			.76				+ .440	180 0 0'000				
	495	LXXXI	.26	+ .33	-.156		+ .174	63 50 17'484	4'8018983,1	63372'13	12'002	
		LXXV	.25	+ .46	+ .070		+ .530	61 19 16'230	4'7919982,6	61943'86	11'732	
		LXXVIII	.25	+ .02	+ .086		+ .106	54 50 26'286	4'7613546,8	57723'77	10'933	
			.76				+ .810	180 0 0'000				
	496	LXXV	.21	- .15	-.070		- .220	57 42 31'400	4'7462121,0	55745'79	10'558	
		LXXVIII	.20	+ .09	-.048		+ .042	48 20 50'992	4'6926097,6	49273'09	9'332	
		LXXVI	.21	+ .15	+ .118		+ .268	73 56 37'608	4'8018983,1	63372'13	12'002	
			.62				+ .090	180 0 0'000				
	497	LXXVIII	.24	+ .04	-.150		- .110	63 10 47'490	4'7826143,5	60619'78	11'481	
		LXXVI	.23	+ .08	+ .054		+ .134	61 40 4'234	4'7766283,7	59789'97	11'324	
		LXXX	.23	+ .25	+ .096		+ .346	55 9 8'276	4'7462121,0	55745'79	10'558	
			.70				+ .370	180 0 0'000				
	499	LXXVI	.22	+ .07	-.088		- .018	55 14 35'622	4'7404168,1	55006'85	10'418	
		LXXX	.23	- .04	-.055		- .095	59 52 39'635	4'7627611,4	57911'01	10'968	
		LXXIX	.23	+ .01	+ .143		+ .153	64 52 44'743	4'7826143,5	60619'78	11'481	
			.68				+ .040	180 0 0'000				
	493	LXXVIII	.22	+ .46	+ .015		+ .475	57 21 21'635	4'7442578,3	55495'51	10'511	
		LXXXI	.21	- .37	-.007		- .377	52 36 45'293	4'7190460,7	52365'60	9'918	
		LXXXIII	.22	- .29	-.008		- .298	70 1 53'072	4'7919982,6	61943'86	11'732	
			.65				- .200	180 0 0'000				

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles	
492	755	LXXXI	"	"	"	"	"	o' ' "				
		LXXXIII	.23	-.09	+.007		-.083	58 57 32.637	4.7651200,3	58226.41	11.028	
		LXXXIV	.24	+.59	+.003		+.593	66 17 37.213	4.7939553,9	62223.64	11.785	
				.23	-.51	-.010		-.520	54 44 50.150	4.7442578,3	55495.51	10.511
				.70				-.010	180 0 0.000			
		755	LXIX	.18	+.25		-.159	+.091	52 8 35.481	4.6956900,3	49623.80	9.398
			LXXI	.18	-.19		+.007	-.183	49 55 8.107	4.6820496,0	48089.43	9.108
			LXXII	.19	-.19		+.152	-.038	77 56 16.412	4.7886161,7	61463.34	11.641
				.55				-.130	180 0 0.000			
		756	LXXI	.17	+.08		-.038	+.042	66 25 35.642	4.7223612,1	52766.85	9.994
			LXXII	.16	+.26		-.189	+.071	54 2 12.191	4.6683655,4	46597.81	8.825
			LXXIV	.17	-.07		+.227	+.157	59 32 12.167	4.6956900,3	49923.80	9.398
				.50				+.270	180 0 0.000			
		757	LXXI	.17	+.21		-.162	+.048	59 15 12.548	4.7064724,8	50871.26	9.635
			LXXIV	.18	+.25		+.166	+.416	68 49 5.346	4.7418782,5	55192.27	10.453
			LXXV	.17	-.38		-.004	-.384	51 55 42.106	4.6683655,4	46597.81	8.825
				.52				+.080	180 0 0.000			
		758	LXXIV	.18	-.34		+.004	-.336	53 17 56.854	4.6926097,6	49273.09	9.332
			LXXV	.19	-.25		-.232	-.482	70 49 49.228	4.7637869,5	58047.96	10.994
			LXXVI	.19	-.15		+.228	+.078	55 52 13.918	4.7064724,8	50871.26	9.635
				.56				-.740	180 0 0.000			
		759	LXXIV	.17	+.02		-.001	+.019	48 18 42.119	4.6547798,6	45162.70	8.554
			LXXVI	.18	+.02		-.133	-.113	57 58 56.547	4.7099276,6	51277.60	9.712
			LXXVII	.18	-.03		+.134	+.104	73 42 21.334	4.7637869,5	58047.96	10.994
			.53				+.010	180 0 0.000				
	760	LXXVI	.17	+.03		-.179	-.149	55 17 30.871	4.6914531,3	49142.03	9.307	
		LXXVII	.17	-.05		+.025	-.025	75 38 21.715	4.7627611,4	57911.01	10.968	
		LXXIX	.17	-.06		+.154	+.094	49 4 7.414	4.6547798,6	45162.70	8.554	
			.51				-.080	180 0 0.000				
	761	LXXXIII	.24	-.12		-.101	-.221	55 1 49.569	4.7552682,6	56920.44	10.780	
		LXXXI	.25	+.22		+.049	+.269	62 2 23.219	4.7878374,5	61353.23	11.620	
		LXXXII	.25	+.32		+.052	+.372	62 55 47.212	4.7913515,4	61851.69	11.714	
			.74				+.420	180 0 0.000				
	762	LXXXI	.24	-.24		+.032	-.208	58 54 29.672	4.7691408,9	58768.00	11.130	
		LXXXII	.24	-.55		-.088	-.638	65 3 9.342	4.7939553,9	62223.64	11.785	
		LXXXIV	.24	+.64		+.056	+.696	56 2 20.986	4.7552682,6	56920.44	10.780	
			.72				-.150	180 0 0.000				
498		LXXXIX	.20	+.50	-.059		+.441	60 4 23.241	4.7366906,7	54536.93	10.329	
		LXXX	.20	+.46	-.051		+.409	58 59 4.669	4.7318360,7	53930.70	10.214	
		LXXXV	.21	+.45	+.110		+.560	60 56 32.090	4.7404168,1	55906.85	10.418	
			.61				+.1410	180 0 0.000				
499		LXXX	.23	+.18	-.123		+.057	57 33 18.177	4.7583618,2	57327.34	10.857	
		LXXXV	.23	-.16	+.045		-.115	69 2 37.505	4.8023459,9	63437.49	12.015	
		LXXXVII	.23	-.07	+.078		+.008	53 24 4.318	4.7366906,7	54536.93	10.329	
			.69				-.050	180 0 0.000				

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No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
500		LXXXVII	"	"	"	"	"	o' ' "			
		LXXXV	.23	— .05	— .107		— .157	61 1 31.263	4.7642078,6	58104.24	11.005
		LXXXIX	.22	— .46	+ .048		— .412	59 18 14.418	4.7567239,8	57111.55	10.817
501		LXXXV	.23	— .17	+ .059		— .111	59 40 14.319	4.7583618,2	57327.34	10.857
		LXXXIX	.68				— .680	180 0 0.000			
		LXXXVIII	.18	+ .20	— .080		+ .120	46 26 17.270	4.6484574,5	44509.99	8.430
789		LXXXIX	.18	+ .46	— .022		+ .438	62 29 10.298	4.7362151,4	54477.25	10.318
		LXXXVI	.18	+ .19	+ .102		+ .292	71 4 32.432	4.7642078,6	58104.24	11.005
		LXXXV	.54				+ .850	180 0 0.000			
790		LXXXVI	.20	+ .09		— .105	— .015	50 43 40.825	4.6943820,7	49474.57	9.370
		LXXXVIII	.20	— .00		— .049	— .049	71 43 12.751	4.7830686,1	60683.22	11.493
		LXXXIX	.20	+ .29		+ .154	+ .444	57 33 6.424	4.7318360,7	53930.70	10.214
502		LXXXV	.60				+ .380	180 0 0.000			
		LXXXVI	.17	+ .06		— .074	— .014	52 33 4.756	4.6649857,4	46236.58	8.757
		LXXXVIII	.17	+ .18		— .052	+ .128	69 17 30.518	4.7362151,4	54477.25	10.318
503		XC	.17	+ .21		+ .126	+ .336	58 9 24.726	4.6943820,7	49474.57	9.370
		LXXXVIII	.51				+ .450	180 0 0.000			
		LXXXIX	.15	— .00	— .072		— .072	55 13 27.018	4.6630283,9	46028.67	8.718
504		XC	.16	+ .20	— .055		+ .145	70 16 54.865	4.7170704,7	52127.93	9.873
		XCII	.15	+ .05	+ .127		+ .177	53 29 38.117	4.6484574,5	44509.99	8.430
		XCIII	.46				+ .250	180 0 0.000			
505		XCII	.13	— .18	— .108		— .288	56 7 6.062	4.6263883,6	42304.67	8.012
		XCIII	.13	— .22	+ .058		— .162	59 17 24.918	4.6415903,6	43811.73	8.298
		XCIV	.14	+ .03	+ .050		+ .080	64 35 29.020	4.6630283,9	46028.67	8.718
506		XCIV	.40				— .370	180 0 0.000			
		XC	.17	— .32	— .089		— .409	81 38 7.241	4.7927849,3	62056.16	11.753
		XCII	.17	— .33	+ .007		— .323	55 57 7.587	4.7157586,8	51970.71	9.843
791		XCIII	.17	+ .09	+ .082		+ .172	42 24 45.172	4.6263883,6	42304.67	8.012
		XCIV	.51				— .560	180 0 0.000			
		XC	.17	+ .02	— .034		— .014	59 22 48.826	4.7335732,2	54146.85	10.255
792		XCIII	.17	— .27	— .033		— .303	40 7 29.907	4.6079828,2	40549.25	7.680
		XC	.17	+ .16	+ .067		+ .227	80 29 41.267	4.7927849,3	62056.16	11.753
		XCII	.51				— .090	180 0 0.000			
506		LXXXVIII	.19	+ .73		— .021	+ .709	69 2 26.679	4.7556267,3	56967.44	10.780
		XC	.18	+ .44		— .102	+ .338	52 15 15.568	4.6833880,0	48237.86	9.136
		XCII	.19	+ .31		+ .123	+ .433	58 42 17.753	4.7170704,7	52127.93	9.873
506		XCIII	.56				+ 1.480	180 0 0.000			
		XCIV	.18	+ .01		— .056	— .046	79 37 44.004	4.8041469,1	63701.10	12.065
		XC	.18	+ .35		— .100	+ .250	38 46 1.310	4.6079828,2	40549.25	7.680
506		XCII	.18	— .01		+ .156	+ .146	61 36 14.686	4.7556267,3	56967.44	10.789
		XCIV	.54				+ .350	180 0 0.000			
		XC	.24	— .00	— .051		— .051	82 45 0.509	4.8596817,5	72390.53	13.710
506		XCIII	.23	+ .18	+ .009		+ .189	49 20 51.269	4.7432238,8	55363.54	10.486
		XCIV	.23	+ .05	+ .042		+ .092	47 54 8.222	4.7335732,2	54146.85	10.255
		XC	.70				+ .230	180 0 0.000			

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
507		XCIII XCV XCVI	"	"	"	"	"	0 1 "			
			'25	- '15	- '055		- '205	41 54 50'645	4'7009331,6	50226'53	9'513
			'26	+ '04	- '010		+ '030	63 45 48'740	4'8289281,9	67441'65	12'773
			'26	+ '12	+ '065		+ '185	74 19 20'615	4'8596817,5	72390'53	13'710
			'77				+ '010	180 0 0'000			
508		XCVI XCV XCVIII	'20	- '07	- '023		- '093	73 7 12'097	4'7812473,3	60429'27	11'445
			'19	+ '03	- '046		- '016	54 11 29'284	4'7093822,2	51213'24	9'699
			'19	+ '19	+ '069		+ '259	52 41 18'619	4'7009331,6	50226'53	9'513
			'58				+ '150	180 0 0'000			
509		XCV XCVIII XCIX	'21	- '00	- '070		- '070	53 28 50'890	4'7229812,6	52842'24	10'008
			'22	- '19	+ '041		- '149	59 43 56'011	4'7542626,5	56788'79	10'755
			'22	+ '08	+ '029		+ '109	66 47 13'099	4'7812473,3	60429'27	11'445
			'65				- '110	180 0 0'000			
793		XCIV XCV XCVII	'20	- '08		- '063	- '143	53 32 13'027	4'7082691,7	51082'15	9'675
			'21	- '30		+ '046	- '254	65 48 44'926	4'7629778,6	57939'92	10'973
			'20	- '19		+ '017	- '173	60 39 2'047	4'7432238,8	55363'54	10'486
			'61				- '570	180 0 0'000			
794		XCV XCVII XCIX	'22	+ '13		+ '038	+ '168	74 50 56'618	4'8176404,0	65711'35	12'445
			'22	+ '10		- '066	+ '034	56 31 48'584	4'7542626,5	56788'79	10'755
			'22	- '23		+ '028	- '202	48 37 14'798	4'7082691,7	51082'15	9'675
			'66				- '000	180 0 0'000			
510		XCIX XCVIII C	'19	+ '25	- '098		+ '152	59 57 19'392	4'7275184,8	53397'20	10'113
			'20	+ '37	+ '047		+ '417	61 6 11'867	4'7324356,1	54005'20	10'228
			'19	+ '38	+ '051		+ '431	58 56 28'741	4'7229812,6	52842'24	10'008
			'58				+ 1'000	180 0 0'000			
511		XCVIII C CI	'17	- '47	- '042		- '512	59 0 30'968	4'7017220,5	50317'85	9'530
			'17	- '50	- '044		- '544	55 31 35'746	4'6847495,1	48389'32	9'165
			'18	- '36	+ '086		- '274	65 27 53'286	4'7275184,8	53397'20	10'113
			'52				- 1'330	180 0 0'000			
512		CI C CIII	'20	+ '16	- '043		+ '117	65 18 33'937	4'7553274,7	56928'20	10'782
			'20	+ '50	- '060		+ '440	61 15 56'800	4'7398955,9	54940'88	10'405
			'19	+ '63	+ '103		+ '733	53 25 29'263	4'7017220,5	50317'85	9'530
			'59				+ 1'290	180 0 0'000			
513		C CIII CIV	'26	- '38	- '091		- '471	64 49 16'769	4'8141415,0	65184'07	12'345
			'26	- '26	+ '035		- '225	62 57 32'645	4'8072225,8	64153'83	12'150
			'26	+ '04	+ '056		+ '096	52 13 10'586	4'7553274,7	56928'20	10'782
			'78				- '600	180 0 0'000			
795		XCIX C CII	'20	+ '64		- '175	+ '465	51 30 49'325	4'6975314,2	49834'65	9'438
			'20	+ '14		+ '097	+ '237	70 27 46'567	4'7781514,2	60000'02	11'364
			'20	+ '10		+ '078	+ '178	58 1 24'108	4'7324356,1	54005'20	10'228
			'60				+ '880	180 0 0'000			
796		C CII CIV	'19	+ '12		+ '047	+ '167	48 58 54'167	4'6903510,8	49017'49	9'284
			'19	+ '20		- '112	+ '088	80 55 33'798	4'8072225,8	64153'83	12'150
			'19	- '03		+ '065	+ '035	50 5 32'035	4'6975314,2	49834'65	9'438
			'57				+ '290	180 0 0'000			



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No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
514		CIV CIII CV	"	"	"	"	"	o' "			
			'23	- '37	- '050		- '420	64 12 54'490	4'7937882,3	62199'69	11'780
			'22	- '03	+ '035		+ '005	45 6 47'565	4'6896779,3	48941'57	9'269
515		CIII CV CVI	'23	- '40	+ '015		- '385	70 40 17'945	4'8141415,0	65184'07	12'345
			'68				- '800	180 0 0'000			
			'25	- '15	- '020		- '170	65 56 0'060	4'8092384,8	64452'31	12'207
516		CV CVI CIX	'25	- '28	- '034		- '314	52 17 2'656	4'7469394,7	55839'24	10'576
			'25	- '09	+ '054		- '036	61 46 57'284	4'7937882,3	62199'69	11'780
			'75				- '520	180 0 0'000			
517		CVI CIX CX	'24	+ '33	- '051		+ '279	62 43 48'399	4'7901549,5	61681'50	11'682
			'23	+ '19	+ '033		+ '223	49 1 24'393	4'7192567,6	52391'01	9'923
			'24	+ '42	+ '018		+ '438	68 14 47'208	4'8092384,8	64452'31	12'207
518		CX CIX CXI	'71				+ '940	180 0 0'000			
			'19	+ '13	- '015		+ '115	64 23 44'095	4'7625477,3	57882'56	10'963
			'18	+ '14	- '026		+ '114	41 39 41'704	4'6300828,5	42666'09	8'081
519		CIX CXI CXII	'19	- '01	+ '041		+ '031	73 56 34'201	4'7901549,5	61681'50	11'682
			'56				+ '260	180 0 0'000			
			'22	+ '03	- '014		+ '016	72 38 26'766	4'8090648,7	64426'55	12'202
797		CIV CV CVII	'22	+ '23	- '039		+ '191	48 19 17'381	4'7c25657,3	50415'69	9'548
			'22	- '10	+ '053		- '047	59 2 15'853	4'7625477,3	57882'56	10'963
			'66				+ '160	180 0 0'000			
798		CV CVII CVIII	'22	+ '16	- '055		+ '105	55 23 32'965	4'7440015,1	55462'76	10'504
			'22	+ '07	+ '039		+ '109	51 39 2'859	4'7230200,3	52846'96	10'009
			'22	- '00	+ '016		+ '016	72 57 24'176	4'8090648,7	64426'55	12'202
799		CV CVIII CIX	'66				+ '230	180 0 0'000			
			'15	+ '41		- '047	+ '363	56 22 29'683	4'6582119,7	45521'02	8'621
			'15	+ '20		+ '050	+ '250	60 5 5'100	4'6756353,3	47384'39	8'974
800		CVIII CIX CXII	'16	+ '44		- '003	+ '437	63 32 25'217	4'6896779,3	48941'57	9'269
			'46				+ 1'050	180 0 0'000			
			'18	+ '40		+ '038	+ '438	56 4 36'648	4'7133729,2	51686'00	9'789
520		CXII CXI CXIII	'18	+ '50		- '040	+ '460	76 58 7'170	4'7830753,9	60684'17	11'493
			'18	+ '71		+ '002	+ '712	46 57 16'182	4'6582119,7	45521'02	8'621
			'54				+ 1'610	180 0 0'000			
520		CV CVIII CIX	'21	- '52		- '018	- '538	58 9 7'992	4'7437229,0	55427'19	10'498
			'21	- '12		- '029	- '149	53 24 36'031	4'7192567,6	52391'01	9'923
			'22	- '19		+ '047	- '143	68 26 15'977	4'7830753,9	60684'17	11'493
520		CVIII CIX CXII	'64				- '830	180 0 0'000			
			'22	- '37		- '084	- '454	49 20 33'486	4'7230200,3	52846'96	10'009
			'23	- '18		+ '055	- '125	77 56 23'455	4'8333033,4	68124'50	12'902
520		CXII CXI CXIII	'23	- '05		+ '029	- '021	52 43 3'059	4'7437229,0	55427'19	10'498
			'68				- '600	180 0 0'000			
			'24	- '12	- '087		- '207	61 39 18'093	4'7855343,6	61028'73	11'558
520		CXII CXI CXIII	'25	- '06	+ '036		- '024	65 13 49'436	4'7990856,5	62,63 03	11'925
			'24	- '05	+ '051		+ '001	53 6 52'471	4'7440015,1	55462'76	10'504
			'73				- '230	180 0 0'000			

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
521		CXI CXIII CXIV	"	"	"	"	"	° ' "			
			.25	-.36	-.023		-.383	69 48 20.017	4.8212835,0	66264.89	12.550
			.24	-.24	-.051		-.291	50 23 2.839	4.7355175,2	54389.81	10.301
			.25	-.24	+0.074		-.166	59 48 37.144	4.7855343,6	61028.73	11.558
			.74				-.840	180 0 0.000			
522		CXIV CXIII CXVI	.28	+0.17	-.035		+0.135	59 34 25.775	4.8059787,3	63970.35	12.116
			.28	+0.23	-.041		+0.189	57 8 47.589	4.7946399,7	62321.80	11.803
			.28	+0.26	+0.076		+0.336	63 16 46.636	4.8212835,0	66264.89	12.550
			.84				+0.660	180 0 0.000			
523		CXIII CXVI CXVII	.22	-.28	-.054		-.334	73 43 18.826	4.8260647,1	66998.44	12.689
			.21	-.37	+0.036		-.334	39 51 16.156	4.6505827,2	44728.33	8.471
			.22	-.27	+0.018		-.252	66 25 25.018	4.8059787,3	63970.35	12.116
			.65				-.920	180 0 0.000			
801		CXII CXIII CXV	.20	+0.13		-.067	+0.063	52 0 11.053	4.7131307,1	51657.18	9.784
			.21	+0.24		+0.050	+0.290	54 9 3.400	4.7253670,2	53133.33	10.063
			.21	+0.07		+0.017	+0.087	73 50 45.547	4.7990856,5	62963.03	11.925
			.62				+0.440	180 0 0.000			
802		CXIII CXV CXVII	.18	+0.10		+0.045	+0.145	71 28 53.505	4.7526690,1	56580.79	10.716
			.17	+0.05		-.081	-.031	48 33 17.369	4.6505827,2	44728.33	8.471
			.17	+0.06		+0.036	+0.096	59 57 49.126	4.7131307,1	51657.18	9.784
			.52				+0.210	180 0 0.000			
524		CXVII CXVI CXVIII	.25	+0.14	-.089		+0.051	49 31 24.531	4.7340101,8	54201.36	10.265
			.25	-.14	+0.057		-.083	60 22 47.237	4.7919927,0	61943.07	11.732
			.25	-.10	+0.032		-.068	70 5 48.232	4.8260647,1	66998.44	12.689
			.75				-.100	180 0 0.000			
525		CXVI CXVIII CXIX	.19	+0.39	-.036		+0.354	57 44 6.254	4.7154778,8	51937.12	9.837
			.19	+0.26	-.039		+0.221	60 19 30.901	4.7272633,3	53365.84	10.107
			.20	+0.13	+0.075		+0.205	61 56 22.845	4.7340101,8	54201.36	10.265
			.58				+0.780	180 0 0.000			
526		CXIX CXVIII CXXI	.20	+0.28	-.023		+0.257	70 58 18.077	4.7745790,0	59508.50	11.271
			.19	+0.08	-.052		+0.028	53 25 54.838	4.7037791,1	59556.75	9.575
			.20	+0.04	+0.075		+0.115	55 35 47.085	4.7154778,8	51937.12	9.837
			.59				+0.400	180 0 0.000			
527		CXVIII CXXI CXXII	.25	-.19	-.063		-.253	68 47 12.227	4.8166054,1	65554.94	12.416
			.24	+0.15	+0.032		+0.182	53 24 23.722	4.7517315,1	56458.78	10.693
			.25	-.24	+0.031		-.209	57 48 24.051	4.7745790,0	59508.50	11.271
			.74				-.280	180 0 0.000			
803		CXVII CXVIII CXX	.17	-.12		-.129	-.249	45 12 1.441	4.6465690,3	44316.86	8.393
			.17	-.04		+0.097	+0.057	52 8 37.567	4.6929516,6	49311.89	9.339
			.17	+0.08		+0.032	+0.112	82 39 20.992	4.7919927,0	61943.07	11.732
			.51				-.080	180 0 0.000			
804		CXVIII CXX CXXII	.16	-.05		+0.025	-.025	55 12 55.025	4.6805556,2	47924.28	9.077
			.17	-.00		-.094	-.094	75 21 59.056	4.7517315,1	56458.78	10.693
			.16	+0.24		+0.069	+0.309	49 25 5.919	4.6465690,3	44316.86	8.393
			.49				+0.190	180 0 0.000			

GREAT INDUS SERIES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle			Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit		Total	Log. feet	Feet	Miles
528		CXXI	"	"	"	"	"	0 1 "			
		CXXII	.27	- .11	- .020		- .130	67 14 2'960	4.8304442,0	67677.48	12.818
		CXXIII	.26	+ .50	- .044		+ .456	49 29 27.336	4.7466558,4	55802.78	10.569
			.27	- .04	+ .064		+ .024	63 16 29.704	4.8166054,1	65554.94	12.416
			.80				+ .350	180 0 0.000			
529		CXXII	.22	- .27	- .065		- .335	56 18 14.675	4.7615256,2	57746.49	10.937
		CXXIII	.22	+ .09	+ .052		+ .142	46 30 53.492	4.7020747,6	50358.73	9.538
		CXXV	.23	+ .27	+ .013		+ .283	77 10 51.833	4.8304442,0	67677.48	12.818
			.67				+ .090	180 0 0.000			
530		CXXV	.22	- .08	- .054		- .134	73 57 31.096	4.8091157,4	64434.10	12.203
		CXXIII	.21	- .05	+ .030		- .020	46 34 36.870	4.6874787,2	48694.37	9.222
		CXXVII	.21	+ .42	+ .024		+ .444	59 27 52.034	4.7615256,2	57746.49	10.937
			.64				+ .290	180 0 0.000			
531		CXXIII	.29	+ .35	- .017		+ .333	70 15 57.023	4.8572366,7	71984.12	13.633
		CXXVII	.29	- .04	- .049		- .089	52 19 27.601	4.7819644,1	60529.13	11.464
		CXXVI	.29	+ .52	+ .066		+ .586	57 24 35.376	4.8091157,4	64434.10	12.203
			.87				+ .830	180 0 0.000			
805		CXXI	.18	+ .41		- .010	+ .400	49 44 44.310	4.6690032,2	46666.28	8.838
		CXXIII	.18	- .18		- .055	- .235	64 23 12.825	4.7414526,8	55138.21	10.443
		CXXIV	.19	- .34		+ .065	- .275	65 52 2.865	4.7466558,4	55802.78	10.569
			.55				- .110	180 0 0.000			
806		CXXIII	.21	+ .25		- .074	+ .176	68 58 48.706	4.7907559,4	61766.92	11.698
		CXXIV	.21	+ .28		- .005	+ .275	66 10 13.035	4.7819644,1	60529.13	11.464
		CXXVI	.20	+ .01		+ .079	+ .089	44 50 58.259	4.6690032,2	46666.28	8.838
			.62				+ .540	180 0 0.000			
532		CXXVII	.29	- .05	- .074		- .124	51 27 38.706	4.7804109,5	60313.00	11.423
		CXXVI	.29	- .44	+ .048		- .392	59 32 44.048	4.8226270,1	66470.20	12.589
		CXXVIII	.30	- .36	+ .026		- .334	68 59 37.246	4.8572366,7	71984.12	13.633
			.88				- .850	180 0 0.000			
533		CXXVI	.19	+ 1.05	- .033		+ 1.017	51 18 48.647	4.6949491,9	49539.22	9.382
		CXXVIII	.20	+ .81	- .025		+ .785	56 49 9.405	4.7252317,6	53116.78	10.060
		CXXIX	.20	+ .69	+ .058		+ .748	71 52 1.948	4.7804109,5	60313.00	11.423
			.59				+ 2.550	180 0 0.000			
534		CXXIX	.19	+ .04	- .018		+ .022	71 58 36.772	4.7703254,9	58928.51	11.161
		CXXVIII	.19	+ .03	- .050		- .020	54 56 55.390	4.7052682,4	50730.39	9.608
		CXXXI	.18	- .30	+ .068		- .232	53 4 27.838	4.6949491,9	49539.22	9.382
			.56				- .230	180 0 0.000			
535		CXXVIII	.26	+ .15	- .054		+ .096	69 41 51.136	4.8243709,2	66737.65	12.640
		CXXXI	.25	+ .32	+ .028		+ .348	54 23 42.808	4.7023448,2	57855.52	10.957
		CXXXII	.25	+ .13	+ .026		+ .156	55 54 26.056	4.7703254,9	58928.51	11.161
			.76				+ .600	180 0 0.000			
807		CXXVII	.17	+ .01		- .096	- .086	49 47 24.314	4.7055454,8	50762.79	9.614
		CXXVIII	.17	+ .24		+ .077	+ .317	40 28 22.677	4.6349360,0	43145.55	8.172
		CXXX	.18	+ .08		+ .019	+ .099	89 44 13.009	4.8226270,1	66470.20	12.589
			.52				+ .330	180 0 0.000			

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance			
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles	
536	808	CXXXVIII	.22	— .38		+ .026	— .354	69 4 2'806	4'7913493,3	61851'37	11'714	
		CXXX	.22	— .27		— .107	— .377	60 53 13'023	4'7623448,2	57855'52	10'957	
		CXXXII	.21	— .27		+ .081	— .189	50 2 44'171	4'7055454,8	50762'79	9'614	
	537	809		.65				— .920	180 0 0'000			
			CXXXII	.25	+ .46	— .035		+ .425	91 34 3'655	4'9155735,5	82332'93	15'593
			CXXXI	.24	+ .28	+ .017		+ .297	34 18 32'677	4'6667509,5	46424'90	8'793
		CXXXIV	.24	+ .25	+ .018		+ .268	54 7 23'668	4'8243709,2	66737'65	12'640	
			.73				+ .990	180 0 0'000				
		CXXXI	.23	— .22	— .019		— .239	49 27 20'551	4'7983947,2	62862'94	11'906	
	CXXXIV	.23	+ .50	— .016		+ .484	34 57 52'564	4'6758440,2	47407'17	8'979		
	CXXXIII	.24	+ .08	+ .035		+ .115	95 34 46'885	4'9155735,5	82332'93	15'593		
	538	809		.70				+ .360	180 0 0'000			
CXXXI			.25	+ .06		— .002	+ .058	83 45 53'448	4'8895855,9	77550'68	14'688	
CXXXII			.24	— .07		— .018	— .088	37 25 21'452	4'6758440,2	47407'17	8'979	
CXXXIII		.25	— .01		+ .020	+ .010	58 48 45'100	4'8243709,2	66737'65	12'640		
		.74				— .020	180 0 0'000					
CXXXIII		.26	— .03	— .003		— .033	84 35 56'137	4'8935650,6	78264'54	14'823		
CXXXIV		.26	+ .11	— .055		+ .055	42 18 17'495	4'7235611,7	52912'85	10'021		
CXXXV		.26	— .05	+ .058		+ .008	53 5 46'368	4'7983947,2	62862'94	11'906		
539		810		.78				+ .030	180 0 0'000			
			CXXXIV	.19	+ .07	— .063		+ .007	41 55 35'047	4'7281755,7	53478'05	10'128
			CXXXV	.19	— .19	+ .065		— .125	35 59 47'955	4'6724688,3	47040'16	8'909
		CXXXVI	.20	— .02	— .002		— .022	102 4 36'998	4'8935650,6	78264'54	14'823	
		.58				— .140	180 0 0'000					
	CXXXIII	.23	+ .10		+ .075	+ .175	38 50 9'985	4'6724688,3	47040'16	8'909		
CXXXIV	.23	+ .18		— .118	+ .062	84 13 52'762	4'8729307,2	74652'97	14'135			
CXXXVI	.23	+ .05		+ .043	+ .093	56 55 57'253	4'7983947,2	62862'94	11'906			
540	810		.69				+ .330	180 0 0'000				
		CXXXV	.22	— .12	— .031		— .151	45 22 15'809	4'7151321,4	51895'79	9'829	
		CXXXVI	.22	+ .28	— .025		+ .255	87 27 33'565	4'8624255,8	72849'33	13'797	
	CXXXVII	.22	+ .22	+ .056		+ .276	47 10 10'626	4'7281755,7	53478'05	10'128		
		.66				+ .380	180 0 0'000					
	CXXXVI	.21	— .23	— .037		— .267	63 6 56'383	4'7520600,2	56501'51	10'701		
CXXXVII	.20	— .08	+ .023		— .057	61 52 40'483	4'7471751,7	55869'55	10'581			
CXXXIX	.20	+ .15	+ .014		+ .164	55 0 23'134	4'7151321,4	51895'79	9'829			
541	811		.61				— .160	180 0 0'000				
		CXXXIX	.27	— .32	— .033		— .353	74 23 3'427	4'8609174,3	72596'79	13'749	
		CXXXVII	.27	— .42	+ .017		— .403	57 3 46'987	4'8011524,5	63263'39	11'982	
	CXL	.27	+ .01	+ .016		+ .026	48 33 9'586	4'7520600,2	56501'51	10'701		
		.81				— .730	180 0 0'000					
	CXXXVII	.82	+ .04	— .020		+ .020	71 18 10'690	5'1636871,0	145776'36	27'609		
CXL	.83	— .03	— .048		— .078	80 33 3'692	5'1813003,3	151809'98	28'752			
CXLI	.82	+ .37	+ .068		+ .438	28 8 45'618	4'8609174,3	72596'79	13'749			
543	811		.47				+ .380	180 0 0'000				

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
544		CXL	"	"	"	"	"	o' "			
		CXLI	2'44	+ '09	- '040		+ '050	60 53 57'210	5'3304689,5	214027'19	40'535
		CXLIV	2'44	- '15	+ '015		- '135	82 34 43'505	5'3854207,5	242896'22	46'003
			2'43	- '05	+ '025		- '025	36 31 19'285	5'1636871,0	145776'36	27'609
			7'31				- '110	180 0 0'000			
545		CXLI	2'65	+ '30	- '007		+ '293	44 48 22'783	5'2228149,1	167'037'86	31'636
		CXLIV	2'66	+ '49	- '026		+ '464	70 38 39'934	5'3495355,2	223632'81	42'355
		CXLIII	2'66	+ '20	+ '033		+ '233	64 32 57'283	5'3304689,5	214027'19	40'535
			7'97				+ '990	180 0 0'000			
811		CXXXV	'81	+ '20		- '041	+ '159	86 31 6'589	5'1899859,1	154876'64	29'333
		CXXXVII	'81	+ '49		- '066	+ '424	65 28 46'304	5'1497403,2	141169'32	26'737
		CXXXVIII	'81	- '40		+ '107	- '293	28 0 7'107	4'8624255,8	72849'33	13'797
			2'43				+ '290	180 0 0'000			
812		CXXXVII	1'55	+ '06		- '010	+ '050	57 6 21'040	5'1661690,7	146611'85	27'767
		CXXXVIII	1'55	+ '29		- '001	+ '289	60 23 39'599	5'1813003,3	151809'98	28'752
		CXLI	1'56	- '19		+ '011	- '179	62 29 59'361	5'1899859,1	154876'64	29'333
			4'66				+ '160	180 0 0'000			
813		CXXXVIII	1'83	- '23		- '001	- '231	44 33 8'999	5'2023332,1	159343'08	30'179
		CXLI	1'84	- '28		- '041	- '321	95 14 37'179	5'3544454,7	226175'45	42'836
		CXLII	1'83	- '05		+ '042	- '008	40 12 13'822	5'1661690,7	146611'85	27'767
			5'50				- '560	180 0 0'000			
814		CXLI	2'04	+ '08		- '046	+ '034	46 43 20'204	5'2119885,1	162925'29	30'857
		CXLII	2'05	+ '21		+ '013	+ '223	87 52 38'003	5'3495355,2	223632'81	42'355
		CXLIII	2'04	+ '35		+ '033	+ '383	45 24 1'793	5'2023332,1	159343'08	30'179
			6'13				+ '640	180 0 0'000			
546		CXLIV	1'57	+ '15	- '028		+ '122	49 21 12'842	5'1328379,7	135780'68	25'716
		CXLIII	1'57	- '29	+ '028		- '262	61 40 25'708	5'1973541,0	157526'67	29'835
		CXLV	1'58	+ '03	- '000		+ '030	68 58 21'450	5'2228149,1	167037'86	31'636
			4'72				- '110	180 0 0'000			
547		CXLIII	1'21	+ '27	+ '000		+ '270	50 18 15'650	5'0826162,5	120952'89	22'908
		CXLV	1'22	+ '07	- '027		+ '043	69 57 8'823	5'1692914,4	147669'72	27'968
		CXLVI	1'21	- '28	+ '027		- '253	59 44 35'527	5'1328379,7	135780'68	25'716
			3'64				+ '060	180 0 0'000			
548		CXLV	'74	- '25	- '020		- '270	56 35 21'720	5'0180918,0	104253'78	19'745
		CXLVI	'73	- '18	+ '027		- '153	47 50 25'957	4'9665197,1	92580'54	17'534
		CXLVIII	'74	- '43	- '007		- '437	75 34 12'323	5'0826162,5	120952'89	22'908
			2'21				- '860	180 0 0'000			
549		CXLVI	1'41	+ '28	+ '005		+ '285	73 6 37'955	5'2550102,5	179891'34	34'070
		CXLVIII (XVII)	1'42	+ '43	- '035		+ '395	73 12 37'445	5'2552393,9	179986'28	34'088
			1'41	+ '23	+ '030		+ '260	33 40 44'600	5'0180918,0	104253'78	19'745
			4'24				+ '940	180 0 0'000			
550		CXLVIII (XVII)	1'43	- '32	- '016		- '336	48 55 50'684	5'1352438,7	136534'06	25'859
		(XIX)	1'43	- '16	+ '028		- '132	47 41 42'898	5'1269032,8	133937'84	25'367
			1'43	- '24	- '012		- '252	83 22 26'418	5'2550102,5	179891'34	34'070
			4'29				- '720	180 0 0'000			

NOTE.—(XVII) and (XIX) appertain to base-line figures.

PRINCIPAL TRIANGULATION—TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Observed Angle				Corrected plane angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
451	815	CXLIV	1'21	-'36		-'026	- '386	35 58 54'344	5'0013228,7	100305'07	18'997
		CXLV	1'21	+'13		+'039	+ '169	76 41 40'069	5'2204772,0	166141'15	31'466
		CXLVII	1'21	+'16		-'013	+ '147	67 19 25'587	5'1973541,0	157526'67	29'835
				3'63			- '070	180 0 0'000			
	816	CXLV	'73	+'32		+'008	+ '328	87 47 22'458	5'1266196,2	133850'38	25'350
		CXLVII	'73	-'17		-'011	- '181	43 43 18'429	4'9665197,1	92580'54	17'534
		CXLVIII	'73	+'35		+'003	+ '353	48 29 19'113	5'0013228,7	100305'07	18'997
				2'19			+ '500	180 0 0'000			
	817	CXLVII	1'04	+'08		-'032	+ '048	64 47 34'688	5'1193507,1	131628'74	24'930
		CXLVIII	1'03	+'18		+'028	+ '208	48 16 27'308	5'0357464,7	108579'16	20'564
		CXLIX	1'04	+'21		+'004	+ '214	66 55 58'004	5'1266196,2	133850'38	25'350
				3'11			+ '470	180 0 0'000			
818	CXLVIII	1'27	+'04		+'027	+ '067	65 31 26'507	5'1575313,6	143724'68	27'221	
	CXLIX	1'26	+'03		-'040	- '010	58 0 43'560	5'1269032,8	133937'84	25'367	
	(XIX)	1'26	+'30		+'013	+ '313	56 27 49'933	5'1193507,1	131628'74	24'930	
			3'79			+ '370	180 0 0'000				
452	(XIX)	1'02	+'08	-'128		- '048	42 3 11'032	5'0001307,0	100030'10	18'945	
	(XVII)	1'03	-'16	+'081		- '079	71 50 45'221	5'1519985,7	141905'28	26'876	
	(XV)	1'02	-'04	+'047		+ '007	66 6 3'747	5'1352438,7	136534'96	25'859	
			3'07			- '120	180 0 0'000				
453	(XVII)	'50	+'37	-'078		+ '292	47 37 8'782	4'8832213,4	76422'52	14'474	
	(XV)	'51	+'16	+'024		+ '184	57 10 17'684	4'9391981,4	86935'70	16'465	
	(XIII)	'51	+'05	+'054		+ '104	75 12 33'534	5'0001307,0	100030'10	18'945	
			1'52			+ '580	180 0 0'000				
454	(XV)	'22	+'01	-'124		- '114	32 20 56'636	4'6164274,0	41345'42	7'831	
	(XIII)	'23	+'08	+'054		+ '134	66 8 43'564	4'8492312,1	70660'37	13'384	
	(XIV)	'23	-'09	+'070		- '020	81 30 19'800	4'8832213,4	76422'52	14'474	
			'68			- '000	180 0 0'000				
455	(XIX)	1'22	-'17	-'016		- '186	41 52 51'294	5'0467509,0	111365'56	21'092	
	(XV)	1'23	-'16	+'050		- '110	79 50 9'570	5'2153750,2	164200'71	31'099	
	(XVIII)	1'22	-'07	-'034		- '104	58 16 59'136	5'1519985,7	141905'28	26'876	
			3'67			- '400	180 0 0'000				
787	(XVIII)	'58	-'20		-'110	- '310	38 51 20'590	4'8597420,5	72400'58	13'712	
	(XV)	'58	-'14		+'021	- '119	66 20 53'441	5'0241198,2	105710'91	20'021	
	(XVI)	'58	-'15		+'089	- '061	74 47 45'969	5'0467509,0	111365'56	21'092	
			1'74			- '490	180 0 0'000				
788	(XV)	'34	+'22		-'018	+ '202	58 11 35'022	4'8425397,4	69588'86	13'180	
	(XVI)	'34	-'03		-'063	- '093	59 39 28'307	4'8492312,1	70669'37	13'384	
	(XIV)	'35	+'28		+'081	+ '361	62 8 56'671	4'8597420,5	72400'58	13'712	
			1'03			+ '470	180 0 0'000				

NOTE.—(XIII) to (XIX) appertain to base-line figures.

J. B. N. HENNESSEY.

PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

GREAT INDUS SERIES.

The initial elements of this Series are those of the stations (XXIII) and (XXV) and are obtained from the Karachi Longitudinal Series page 51—b, being as follows:—

	Lat. N.	Long. E. of Gh.	Azimuth
At (XXIII) 24°	54' 36".57	67° 23' 10".44	182° 33' 24".25 of (XXV)
„ (XXV) 25	8 56 .17	67 23 52 .61	2 53 42 .09 of (XXIII)
	Distance (XXIII) to (XXV) in Log. feet = 4.9388101,8		

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		o ' "				o ' "	o ' "	o ' "
165	(XXV)	38 54 8.12	4.8987555,7	166	(XXI)	24 58 45.27	67 14 51.97	218 50 19.08
„	„	97 50 24.71	4.9508025,6		(XXIV)	25 10 55.96	67 7 49.59	277 43 35.20
„	„	149 36 36.84	4.9015891,5		I	25 20 17.24	67 16 32.97	329 33 29.34
„	„	207 26 13.26	5.0262718,8		III	25 24 29.92	67 32 46.53	27 30 1.26
	(XXIII)	81 8 11.05	4.8008991,1		(XX)	24 52 59.63	67 11 51.95	261 3 25.42
	„	118 43 9.26	4.7184473,0		(XXI)			298 39 39.03
	(XXI)	25 24 47.50	4.5868608,9		(XX)			205 23 31.61
	„	92 59 35.59	4.7816296,5		(XXII)	24 59 16.15	67 3 55.43	272 54 58.29
	„	152 15 40.64	4.9209328,2		(XXIV)			332 12 41.59
	(XX)	130 56 27.03	4.7636877,4		(XXII)			310 53 6.12
	(XXII)	196 55 57.06	4.8683394,0	(XXIV)			16 57 36.34	
166	I	40 19 34.00	4.8709063,2	(XXIV)			220 15 50.66	
„	„	122 29 28.90	4.9347021,2	II	25 27 54.49	67 3 21.02	302 23 49.19	
„	„	201 0 7.02	4.8768213,6	IV	25 31 53.57	67 21 27.64	21 2 13.58	
„	„	253 59 52.84	4.9678094,3	III			74 6 50.03	

Note.—(XX) to (XXV) appertain to base-line figures.

Fixed Station A				Deduced Station B					
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A	
		° ' "				° ' "	° ' "	° ' "	
167	(XXIV)	166 32 22.18	5.0241965,8	168	II			346 30 27.31	
	IV	76 26 13.37	5.0104401,9		II				256 18 25.60
	"	148 11 5.77	5.0302657,8		V	25 46 55.69	67 11 9.21		328 6 38.00
	"	223 57 57.59	4.9731983,5		VI	25 43 3.38	67 33 21.38		44 3 6.26
"	"	305 42 37.61	4.8845354,2	III				125 47 29.56	
168	II	200 22 23.75	5.0896115,3	V				20 25 46.22	
	VI	1 37 40.82	5.0509610,5	III				181 37 25.79	
	"	100 58 49.61	5.0935133,9	V				280 49 10.86	
	"	137 17 36.83	5.1792869,7	VII	26 1 22.07	67 14 37.76		317 9 26.55	
"	"	176 42 25.59	5.0829591,0	VIII	26 3 0.42	67 32 5.13		356 41 52.30	
169	VIII	49 43 49.42	5.1773625,3	V				229 34 40.51	
	"	84 7 44.87	4.9824357,0	VII				264 0 5.13	
	"	148 48 12.80	5.2495438,4	IX	26 28 4.51	67 15 12.50		328 40 44.77	
	"	170 10 50.75	5.0472945,6	X	26 21 8.65	67 28 36.06		350 9 18.44	
"	V	192 16 7.92	4.9518901,7	VII				12 17 39.01	
170	X	32 33 50.35	5.1524772,3	VII				212 27 40.39	
	"	119 56 15.80	4.9256135,3	IX				299 50 18.38	
	"	155 32 28.71	5.1353536,2	XI	26 41 39.54	67 18 12.54		335 27 50.27	
	"	188 28 33.56	4.9690098,8	XII	26 36 20.80	67 31 7.28		8 29 40.98	
"	VII	181 7 4.05	5.2090178,7	IX				1 7 19.42	
171	XII	60 2 7.83	5.0006159,0	IX				239 55 1.25	
	"	114 39 0.49	4.8881948,5	XI				294 33 12.99	
	"	148 6 34.15	5.1252805,5	XIII	26 55 2.32	67 18 8.41		328 0 43.45	
	"	178 5 9.42	4.9108866,7	XIV	26 49 47.04	67 30 37.25		358 4 55.92	
"	IX	191 13 20.81	4.9237430,1	XI				11 14 41.38	
172	XIV	53 56 40.38	4.9218746,0	XI				233 51 5.05	
	"	115 11 49.88	4.8745036,5	XIII				295 6 11.39	
	"	153 34 39.94	4.9967694,2	XV	27 4 27.16	67 22 28.57		333 30 58.45	
	"	189 0 26.08	4.7996564,4	XVI	27 0 3.73	67 32 26.38		9 1 15.49	
"	XI	179 44 8.55	4.9087856,1	XIII				359 44 6.69	
173	XVI	68 38 45.73	4.9210527,0	XIII				248 32 16.77	
	"	116 14 26.47	4.7798885,4	XV				296 9 54.71	
	"	170 53 12.85	4.9781616,3	XVII	27 15 33.61	67 29 39.47		350 51 56.73	
	"	204 31 14.57	4.7587938,6	XVIII	27 8 40.72	67 36 50.04		24 33 14.57	
"	XIII	202 24 12.72	4.7902597,7	XV				22 26 10.81	

NOTE.—(XXIV) appertains to base-line figures.



Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
174	XVIII	71 50 50.90	4.9135024,9		XV			251 44 18.33
"	"	137 1 49.72	4.7558893,7		XVII			316 58 32.90
"	"	168 44 5.74	5.0041492,4		XIX	27 25 1.26	67 33 11.17	348 42 25.42
"	"	200 13 19.67	4.8109660,4	175	XX	27 18 42.01	67 40 58.04	20 15 13.13
	XV	210 0 44.21	4.8906153,2		XVII			30 4 0.96
175	XX	72 46 48.22	4.8068873,0		XVII			252 41 37.15
"	"	132 19 42.36	4.7551384,1		XIX			312 16 7.76
"	"	194 48 8.92	4.8659246,5		XXI	27 30 25.11	67 44 26.43	14 49 44.86
"	"	250 18 30.34	4.7505682,6	176	XXIII	27 21 49.56	67 50 46.11	70 23 0.40
	XVII	198 24 21.62	4.7811412,4		XIX			18 25 58.84
	XIX	192 10 48.53	4.8024022,9		XXII	27 35 15.41	67 35 39.95	12 11 57.23
	"	241 41 30.12	4.8391978,8		XXI			61 46 41.53
176	XXIII	146 42 59.76	4.7944231,0		XXI			326 40 4.82
"	"	214 59 40.24	4.7404614,1	177	XXV	27 29 15.75	67 56 36.47	35 2 21.61
177	XXV	96 7 44.08	4.8202392,6		XXI			276 2 7.01
"	"	146 48 58.63	4.7926730,5		XXIV	27 37 49.80	67 50 18.90	326 46 3.94
"	"	207 52 25.56	4.7377879,8		XXVI	27 37 14.30	68 1 20.68	27 54 37.03
"	"	269 52 47.96	4.6087328,5	178	XXVIII	27 29 16.39	68 4 7.55	89 56 16.16
	XXI	121 46 36.43	4.7459979,6		XXII			301 42 32.93
	"	215 12 39.94	4.7401679,8		XXIV			35 15 23.07
	XXII	258 47 18.14	4.9062494,4		XXIV			78 54 5.48
	XXIV	216 31 26.75	4.7344134,8		XXVII	27 45 1.40	67 56 18.32	36 34 13.77
	"	273 24 15.38	4.7754374,2		XXVI			93 29 22.24
178	XXVIII	162 43 30.53	4.7036478,1		XXVI			342 42 13.34
"	"	230 56 18.96	4.6160931,0	179	XXX	27 33 34.08	68 10 4.01	50 59 3.69
179	XXX	115 18 56.11	4.7165881,4		XXVI			295 14 53.74
"	"	167 56 29.82	4.7317179,6		XXIX	27 42 16.21	68 7 58.68	347 55 31.70
"	"	231 54 6.44	4.7389297,9	180	XXXI	27 39 8.80	68 18 3.80	51 57 48.76
"	"	288 57 20.15	4.7045536,1		XXXIII	27 30 50.87	68 18 56.07	109 1 26.13
	XXVI	150 4 9.49	4.7359073,7		XXVII			330 1 49.01
	"	229 32 38.52	4.6721908,9		XXIX			49 35 43.30
	XXVII	284 48 4.88	4.8136085,8		XXIX			104 53 30.74
180	XXXI	109 13 18.14	4.7603749,3		XXIX			289 8 37.06
"	"	171 44 14.34	4.7849669,6		XXXII	27 49 6.09	68 16 26.23	351 43 28.93
"	"	226 54 3.04	4.7456045,2	181	XXXV	27 45 25.26	68 25 36.29	46 57 33.41

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
180	XXXI	276 45 45.55	4.6943103,0		XXXIV	27 38 10.82	68 27 10.03	96 49 59.00
"	"	354 39 9.33	4.7032966,2		XXXIII			174 39 33.53
	XXIX	227 43 53.38	4.7894212,9		XXXII			47 47 49.80
	XXXIII	224 58 51.74	4.7982482,0		XXXIV			45 2 40.40
181	XXXV	114 19 56.45	4.7339810,8		XXXII			294 15 40.01
"	"	205 39 19.57	4.5852649,5		XXXVI	27 51 8.74	68 28 41.93	25 40 46.17
"	"	275 42 53.98	4.6952916,9	182	XXXVII	27 44 36.07	68 34 45.39	95 47 9.66
"	"	349 7 19.37	4.6500359,8		XXXIV			169 8 2.94
	XXXII	259 19 49.89	4.8273106,6		XXXVI			79 25 33.41
182	XXXVII	46 29 1.99	4.7518037,5		XXXIV			226 25 30.40
"	"	140 33 58.82	4.7106015,1		XXXVI			320 31 9.32
"	"	196 6 7.75	4.8219006,5		XXXVIII	27 55 7.38	68 38 10.58	16 7 43.54
"	"	232 39 21.70	4.8150472,4	183	XL	27 51 8.11	68 44 23.99	52 43 51.53
	XXXVI	195 51 18.48	4.6814564,8		XXXIX	27 58 46.18	68 31 8.28	15 52 27.00
	"	244 40 50.68	4.7514835,0		XXXVIII			64 45 16.63
183	XL	125 49 21.58	4.6160310,5		XXXVIII			305 46 26.93
"	"	198 30 48.74	4.7031898,5		XLII	27 59 2.16	68 47 22.83	18 32 12.48
"	"	260 45 13.58	4.7843902,0	184	XLIV	27 52 44.51	68 55 33.53	80 50 26.53
	XXXVIII	120 17 28.12	4.6418998,0		XXXIX			300 14 10.21
	"	184 34 6.09	4.7396679,7		XLI	28 4 9.41	68 38 59.41	4 34 29.01
	"	244 22 45.32	4.7395979,6		XLII			64 27 4.17
	XXXIX	232 15 31.46	4.7272500,1		XLI			52 19 12.80
184	XLIV	130 56 36.62	4.7651815,5		XLII			310 52 46.77
"	"	190 16 56.82	4.7660623,0		XLV	28 2 13.05	68 57 29.78	10 17 51.32
"	"	251 7 2.10	4.7965165,3	185	XLVI	27 56 4.66	69 6 33.89	71 12 11.17
	XLII	124 33 13.75	4.7383888,9		XLI			304 29 17.20
	"	192 25 29.02	4.7685986,0		XLIII	28 8 29.74	68 49 43.91	12 26 35.39
	"	250 26 49.38	4.7612538,8		XLV			70 31 34.42
	XLI	245 27 56.55	4.8022003,3		XLIII			65 33 0.17
185	XLVI	127 22 10.47	4.7877625,5		XLV			307 17 55.15
"	"	188 25 59.26	4.7937299,2	186	XLVIII	28 6 13.83	69 8 15.74	8 26 47.11
186	XLVIII	67 14 50.57	4.7976930,1		XLV			247 9 46.62
"	"	127 51 59.90	4.7065090,1		XLVII	28 11 22.86	69 0 46.85	307 48 28.14
"	"	207 7 50.77	4.7618731,2	187	XLIX	28 14 43.05	69 13 10.46	27 10 9.92
"	"	255 2 45.28	4.8011215,5		LI	28 8 55.00	69 19 38.56	75 8 7.17

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
187	XLV	132 23 19'35	4'7517456,6	188	XLIII			312 19 39'99
	"	197 37 0'43	4'7653720,0		XLVII			17 38 33'29
	XLIII	253 32 14'58	4'7913427,4		XLVII			73 37 27'50
	XLIX	73 8 33'01	4'8421033,3		XLVII			253 2 41'42
	"	135 23 43'39	4'7262876,5		L	28 20 58'25	69 6 11'94	315 20 24'99
"	"	196 49 37'27	4'7459265,2		LII	28 23 31'03	69 16 11'04	16 51 2'94
"	"	254 50 16'06	4'7176972,1		LIII	28 16 57'93	69 22 34'09	74 54 42'96
"	"	315 19 27'08	4'6937913,9		LI			135 22 30'46
"	XLVII	206 33 5'91	4'8127233,6		L			26 35 39'87
"	L	253 52 37'16	4'7457959,8		LII			73 57 21'84
188	LIII	17 51 25'61	4'7095688,6	LI			197 50 2'62	
"	"	139 15 36'86	4'7194600,9	LII			319 12 35'04	
"	"	202 16 4'96	4'7278288,6	LIV	28 25 7'53	69 26 20'89	22 17 52'66	
"	"	260 30 16'59	4'7394627,1	LVI	28 18 27'21	69 32 39'80	80 35 3'70	
"	"	322 29 35'97	4'8139692,6	LV	28 8 25'90	69 29 57'29	142 33 5'48	
189	LII	259 48 46'60	4'7428812,7	LIV			79 53 36'71	
	LI	272 59 49'56	4'7439783,0	LV			93 4 41'42	
	LVI	13 28 18'44	4'7954712,9	LV			193 27 1'59	
	"	140 5 19'58	4'7220246,3	LIV			320 2 19'57	
	"	202 23 22'52	4'7209167,1	LVIII	28 26 28'66	69 36 24'22	22 25 9'17	
"	"	261 14 24'50	4'6946904,3	LIX	28 19 41'57	69 41 47'41	81 18 44'26	
"	"	323 38 4'44	4'7580075,7	LVII	28 10 50'33	69 38 59'37	143 41 4'06	
"	LIV	261 18 36'03	4'7362327,7	LVIII			81 23 23'27	
"	LV	253 13 51'72	4'7046570,0	LVII			73 18 7'54	
190	LIX	15 39 25'97	4'7459622,8	LVII			195 38 6'42	
"	"	144 57 1'20	4'7009883,1	LVIII			324 54 27'56	
"	"	211 8 44'23	4'7373664,5	LX	28 27 24'36	69 47 3'96	31 11 14'76	
"	"	266 56 8'51	4'7780782,8	LXII	28 20 12'87	69 52 57'86	87 1 26'70	
"	LVIII	212 7 58'35	4'7304819,5	LXI	28 33 59'35	69 41 44'96	32 10 31'41	
"	"	264 19 51'63	4'7587277,9	LX			84 24 56'39	
191	LXII	144 4 22'32	4'7310318,0	LX			324 1 34'02	
"	"	222 13 1'41	4'7739311,1	LXV	28 27 28'41	70 0 25'23	42 16 34'17	
192	LXV	89 43 32'57	4'8543872,2	LX			269 37 10'76	
"	"	136 55 8'39	4'7503060,1	LXIII	28 34 15'20	69 53 14'09	316 51 42'57	
"	"	186 2 49'67	4'8117173,3	LXVI	28 38 6'67	70 1 41'87	6 3 26'30	

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
192	LXV	228 13 48.25	4.7429743,3	193	LXVIII	28 33 33.15	70 8 8.07	48 17 29.16
	LX	144 31 12.47	4.6901964,3		LXI			324 28 40.20
	"	218 29 11.82	4.7244776,9		LXIII			38 32 8.52
	LXI	268 27 45.25	4.7885943,4		LXIII			88 33 14.81
	LXIII	188 2 6.34	4.6865845,8		LXVII	28 42 11.62	69 54 30.38	8 2 42.90
	"	242 38 49.75	4.7070344,2		LXVI			62 42 52.84
193	LXVIII	128 46 20.78	4.6447843,3		LXVI			308 43 15.93
"	"	201 26 36.82	4.6897182,3	194	LXX	28 41 4.21	70 11 29.00	21 28 13.07
194	LXX	71 6 54.76	4.7426296,0		LXVI			251 2 13.16
"	"	119 57 38.70	4.7100314,6		LXIX	28 45 17.57	70 3 9.70	299 53 38.77
"	"	193 15 9.61	4.7133659,6		LXXI	28 49 22.31	70 13 42.22	13 16 13.69
"	"	256 18 9.62	4.7526371,9	195	LXXIII	28 43 16.46	70 21 46.43	76 23 6.16
	LXVI	122 47 53.23	4.6599799,7		LXVII			302 44 26.22
	"	190 10 55.48	4.6455828,5		LXIX			10 11 37.65
	LXVII	247 51 23.59	4.6980849,9		LXIX			67 55 33.21
	LXIX	194 6 3.84	4.6820496,0		LXXII	28 52 59.35	70 5 21.51	14 7 7.37
	"	246 14 39.50	4.7886161,7		LXXI			66 19 44.11
195	LXXIII	130 38 50.77	4.7540441,1		LXXI			310 34 57.70
"	"	185 8 42.75	4.8003422,7		LXXV	28 53 39.16	70 22 50.15	5 9 13.45
"	"	240 8 24.72	4.7913515,4	243	LXXXI	28 48 21.00	70 31 49.45	60 13 14.89
"	"	295 10 14.53	4.7878374,5		LXXXII	28 38 57.69	70 32 9.73	115 15 13.71
	LXXI	116 14 52.39	4.6956900,3		LXXII			296 10 50.77
	"	182 40 28.21	4.6683655,4		LXXIV	28 57 3.18	70 14 6.70	2 40 40.03
	"	241 55 40.92	4.7418782,5		LXXV			62 0 5.39
	LXXII	242 8 38.42	4.7223612,1		LXXIV			62 12 52.37
243	LXXXI	123 51 45.40	4.7613546,8		LXXV			303 47 25.17
"	"	187 42 3.14	4.7919982,6	244	LXXVIII	28 58 28.77	70 33 22.92	7 42 48.30
"	"	240 18 48.64	4.7442578,3	242	LXXXIII	28 52 52.82	70 40 51.83	60 23 10.30
"	"	299 16 21.51	4.7939553,9		LXXXIV	28 43 19.37	70 41 59.14	119 21 14.90
"	"	358 10 51.42	4.7552682,6		LXXXII			178 11 1.18
	LXXXII	243 14 10.76	4.7691408,9		LXXXIV			63 18 53.67
242	LXXXIII	130 25 3.59	4.7190460,7	244	LXXVIII			310 21 26.44
"	"	354 5 32.84	4.7651200,3		LXXXIV			174 6 5.28
244	LXXVIII	62 33 14.83	4.8018983,1		LXXV			242 28 8.69
"	"	110 54 6.02	4.7462121,0		LXXVI	29 1 45.33	70 23 36.21	290 49 21.57

Fixed Station A				Deduced Station B					
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A	
		° ' "				° ' "	° ' "	° ' "	
244	LXXVIII	174 4 53.75	4.7766283,7	245	LXXX	29 8 17.59	70 32 13.39	354 4 19.99	
	LXXV	113 55 47.66	4.7064724,8		LXXIV				293 51 34.50
	"	184 45 37.08	4.6926097,6		LXXVI				4 45 59.39
	LXXIV	192 14 55.18	4.7099276,6		LXXVII				12 15 54.68
	"	240 33 37.47	4.7637869,5	LXXVI				60 38 13.50	
245	LXXX	49 13 28.49	4.7826143,5	LXXVI				229 9 17.11	
"	"	109 6 8.36	4.7404168,1	LXXIX	29 11 15.46	70 22 26.91		289 1 22.57	
"	"	168 5 13.23	4.7366906,7	LXXXV	29 17 5.89	70 30 6.24		348 4 11.18	
"	"	225 38 31.63	4.8023459,9	246	LXXXVII	29 15 36.42	70 40 45.52	45 42 41.48	
	LXXVI	118 37 10.22	4.6547798,6		LXXVII	29 5 19.30	70 16 9.32		298 33 33.16
	"	173 54 41.26	4.7627611,4	LXXIX				353 54 7.54	
	LXXVII	222 55 11.28	4.6914531,3	LXXIX				42 58 15.13	
	LXXIX	178 13 18.10	4.7830686,1	LXXXVI	29 21 15.97	70 22 5.63		358 13 7.70	
	"	228 56 59.13	4.7318360,7	LXXXV				49 0 43.48	
246	LXXXVII	99 6 46.02	4.7583618,2	LXXXV				279 1 33.44	
"	"	160 8 17.52	4.7567239,8	247	LXXXIX	29 24 28.17	70 37 6.11	340 6 30.03	
247	LXXXIX	39 46 44.58	4.7642078,6		LXXXV				219 43 18.80
"	"	102 15 55.06	4.6484574,5	LXXXVIII	29 26 1.53	70 28 54.18		282 11 53.41	
"	"	172 32 50.08	4.6630283,9	XC	29 32 0.01	70 35 58.52		352 32 16.83	
"	"	228 39 56.27	4.6415903,6	248	XCII	29 29 14.50	70 43 18.38	48 42 59.29	
	LXXXV	120 43 56.43	4.6943820,7		LXXXVI				300 40 1.08
	"	173 17 1.35	4.7362151,4	LXXXVIII				353 16 26.02	
	LXXXVI	231 22 30.39	4.6649857,4	LXXXVIII				51 25 50.92	
	LXXXVIII	156 55 59.37	4.6833880,0	XCI	29 33 20.87	70 25 20.16		336 54 14.00	
	"	225 58 26.24	4.7170704,7	XC				46 1 55.10	
248	XCII	113 18 28.45	4.6263883,6	XC				293 14 51.78	
"	"	194 56 35.86	4.7157586,8	249	XCIV	29 37 31.59	70 45 50.24	14 57 50.77	
249	XCIV	57 22 36.11	4.7927849,3		XC				237 17 44.02
"	"	97 30 6.19	4.7335732,2	XCIII	29 38 41.19	70 35 41.80		277 25 5.33	
"	"	180 15 6.94	4.7432238,8	250	XCIV	29 46 39.68	70 45 53.00	0 15 8.31	
	"	233 47 20.17	4.7629778,6		XCVII	29 43 10.16	70 54 40.47		53 51 42.65
	XC	98 17 10.84	4.7556267,3	XCI				278 11 56.06	
	"	177 54 55.03	4.6079828,2	XCIII				357 54 46.77	
	XCI	239 25 54.57	4.8041469,1	XCIII				59 31 1.64	
250	XCV	48 9 16.76	4.8596817,5	XCIII				228 4 13.83	

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
250	XCV	111 55 5.76	4.7009331,6		XCVI	29 49 45.00	70 37 3.92	291 50 42.79
"	"	166 6 35.23	4.7812473,3		XCVIII	29 56 20.39	70 43 8.10	346 5 13.14
"	"	219 35 26.33	4.7542626,5	251	XCIX	29 53 52.74	70 52 44.22	39 38 50.93
"	"	294 26 23.17	4.7082691,7		XCVII			114 30 44.90
	XCVIII	186 9 22.94	4.8289281,9		XCVI			6 10 3.67
	XCVI	218 43 30.50	4.7093822,2		XCVIII			38 46 31.95
251	XCIX	106 26 4.25	4.7229812,6		XCVIII			286 21 16.91
"	"	166 23 23.84	4.7324356,1	252	C	30 2 32.33	70 50 19.62	346 22 11.60
"	"	217 54 13.36	4.7781514,2		CII	30 1 41.23	70 59 43.58	37 57 42.81
"	"	351 1 35.92	4.8176404,0		XCVII			171 2 33.70
252	C	45 18 40.53	4.7275184,8		XCVIII			225 15 4.84
"	"	100 50 16.45	4.7017220,5		CI	30 4 5.66	70 40 57.13	280 45 34.73
"	"	162 6 13.45	4.7553274,7		CIII	30 11 28.57	70 47 0.26	342 4 33.42
"	"	226 55 30.48	4.8072225,8	253	CIV	30 9 45.76	70 59 13.50	46 59 58.24
"	"	275 54 24.83	4.6975314,2		CII			95 59 7.12
	XCVIII	166 14 33.70	4.6847495,1		CI			346 13 28.20
	CI	215 27 0.59	4.7398955,9		CIII			35 30 2.87
253	CIV	99 13 9.09	4.8141415,0		CIII			279 7 0.51
"	"	163 26 3.81	4.6896779,3	254	CV	30 17 30.11	70.56 34.32	343 24 43.67
"	"	219 48 33.64	4.6756353,3		CVII	30 15 45.96	71 4 59.46	39 51 27.74
"	"	356 54 26.02	4.6903510,8		CII			176 54 41.10
254	CV	54 5 1.85	4.7937882,3		CIII			234 0 12.73
"	"	106 22 4.75	4.8092384,8		CVI	30 20 29.38	70 44 48.52	286 16 8.48
"	"	169 5 53.39	4.7192567,6	255	CIX	30 25 59.35	70 54 41.12	349 4 56.18
"	"	227 15 1.59	4.7830753,9		CVIII	30 24 17.59	71 5 3.24	47 19 18.73
"	"	283 19 38.42	4.6582119,7		CVII			103 23 53.11
	CIII	168 4 12.42	4.7469394,7		CVI			348 3 6.02
	CVII	180 22 0.46	4.7133729,2		CVIII			0 22 2.37
255	CIX	57 19 43.62	4.7901549,5		CVI			237 14 43.86
"	"	98 59 25.51	4.7625477,3		CX	30 27 28.43	70 43 47.84	278 53 54.48
"	"	147 18 43.11	4.8090648,7		CXI	30 34 55.92	70 48 3.03	327 15 21.02
"	"	202 42 16.29	4.7230200,3	256	CXII	30 34 1.87	70 58 34.47	22 44 14.73
"	"	280 38 39.98	4.7437229,0		CVIII			100 43 54.97
	CVI	172 50 59.58	4.6300828,5		CX			352 50 28.87
	CX	206 15 27.49	4.7025657,3		CXI			26 17 37.09

Fixed Station A				Deduced Station B				
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "				° ' "	° ' "	° ' "
256	CXII	95 41 39.12	4.7440015,1	257	CXI			275 36 17.94
"	"	157 20 57.45	4.7990856,5		CXIII	30 43 36.96	70 53 56.62	337 18 35.83
"	"	209 21 8.71	4.7253670,2		CXV	30 41 40.20	71 3 32.80	29 23 40.71
"	"	330 1 11.44	4.8333033,4		CVIII			150 4 28.68
257	CXIII	30 25 28.54	4.7855343,6		CXI			210 22 28.25
"	"	80 48 31.62	4.8212835,0	258	CXIV	30 41 51.59	70 41 27.31	260 42 8.92
"	"	137 57 19.48	4.8059787,3		CXVI	30 51 26.93	70 45 45.07	317 53 7.84
"	"	211 40 38.53	4.6505827,2		CXVII	30 49 53.66	70 58 26.06	31 42 56.41
"	"	283 9 32.22	4.7131307,1		CXV			103 14 26.47
"	CXI	140 34 7.98	4.7355175,2		CXIV			320 30 46.31
258	CXIV	201 7 42.87	4.7946399,7		CXVI			21 9 54.76
	CXVII	98 8 21.64	4.8260647,1	259	CXVI			278 1 51.48
	"	147 39 46.43	4.7919927,0		CXVIII	30 58 31.54	70 52 5.42	327 36 30.93
	"	192 51 48.04	4.6929516,6		CXX	30 57 49.49	71 0 32.16	12 52 52.79
"	"	331 45 7.11	4.7526690,1		CXV			151 47 44.01
259	CXVIII	37 42 19.42	4.7340101,8		CXVI			217 39 3.99
"	"	98 1 50.51	4.7154778,8	260	CXIX	30 59 42.98	70 42 14.50	277 56 46.29
"	"	151 27 45.54	4.7745790,0		CXXI	31 7 8.87	70 46 38.34	331 24 56.84
"	"	220 14 58.01	4.7517315,1		CXXII	31 5 37.87	70 59 5.01	40 18 34.33
"	"	275 27 53.20	4.6465690,3		CXX			95 32 13.95
260	CXVI	159 54 57.55	4.7272633,3			CXIX		
	CXIX	206 58 28.01	4.7037791,1		CXXI			27 0 44.13
	CXXII	98 6 58.63	4.8166054,1		CXXI			278 0 32.88
	"	147 36 26.23	4.8304442,0	261	CXXIII	31 15 3.30	70 52 7.30	327 32 50.02
"	203 54 41.13	4.7020747,6	CXXV		31 13 13.47	71 3 0.10	23 56 42.76	
"	"	350 53 28.25	4.6805556,2		CXX			170 54 13.18
261	CXXI	161 1 45.16	4.7414526,8		CXXIV	31 15 44.93	70 43 11.80	340 59 58.20
	"	210 46 29.65	4.7466558,4		CXXIII			30 49 19.99
	CXXV	101 7 34.82	4.7615256,2	262	CXXIII			281 1 56.30
"	175 5 6.14	4.6874787,2	CXXVII		31 21 13.65	71 2 11.98	355 4 41.15	
262	CXXVII	54 32 33.39	4.8091157,4		CXXIII			234 27 19.22
"	"	106 52 1.28	4.8572366,7	263	CXXVI	31 24 39.68	70 48 56.97	286 45 7.28
"	"	158 19 40.28	4.8226270,1		CXXVIII	31 31 24.93	70 57 28.35	338 17 12.34
"	"	208 7 4.76	4.6349360,0		CXXX	31 27 30.22	71 6 6.77	28 9 7.11
"	CXXIII	95 12 33.00	4.6690032,2		CXXIV			275 7 55.14

## PRINCIPAL TRIANGULATION—LATITUDES, LONGITUDES AND AZIMUTHS.

Fixed Station A				Deduced Station B					
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A	
		° ' "				° ' "	° ' "	° ' "	
263	CXXIII	164 11 21.91	4.7819644,1	264	CXXVI			344 9 42.95	
	CXXIV	208 57 41.90	4.7907559,4		CXXVI				29 0 41.41
	CXXVIII	47 16 49.89	4.7804109,5		CXXVI				227 12 22.95
	"	104 5 59.49	4.6949491,9		CXXIX	31 33 24.04	70 48 13.00		284 1 8.99
	"	159 2 55.07	4.7703254,9		CXXXI	31 40 29.53	70 53 24.49		339 0 47.29
"	"	228 44 46.47	4.7623448,2	CXXXII	31 37 42.23	71 5 51.48		48 49 9.92	
"	"	297 48 49.50	4.7055454,8	CXXX				117 53 20.30	
264	CXXVI	175 53 34.11	4.7252317,6	CXXIX				355 53 11.14	
	CXXIX	212 2 32.03	4.7052682,4	CXXXI				32 5 15.31	
	CXXXII	104 43 36.23	4.8243709,2	CXXXI				284 37 4.24	
	"	142 8 57.92	4.8895855,9	CXXXIII	31 47 47.94	70 56 40.05		322 4 8.05	
	"	196 17 40.14	4.6667509,5	CXXXIV	31 45 3.21	71 8 22.35		16 18 59.39	
265	"	358 46 25.54	4.7913493,3	CXXX				178 46 33.54	
	CXXXIV	70 26 23.30	4.9155735,5	CXXXI				250 18 31.32	
	"	105 24 16.09	4.7983947,2	CXXXIII				285 18 6.28	
	"	147 42 33.85	4.8935650,6	CXXXV	31 55 57.73	71 0 17.13		327 38 17.86	
	"	189 38 9.08	4.6724688,3	CXXXVI	31 52 42.18	71 9 53.68		9 38 57.23	
266	CXXXI	200 51 10.54	4.6758440,2	CXXXIII				20 52 53.40	
	CXXXVI	66 34 54.71	4.8729307,2	CXXXIII				246 27 56.06	
	"	111 43 34.43	4.7281755,7	CXXXV				291 38 29.71	
	"	199 11 8.21	4.7151321,4	CXXXVII	32 0 47.20	71 13 11.78		19 12 53.03	
	"	262 18 4.80	4.7471751,7	CXXXIX	31 53 55.80	71 20 35.99		82 23 44.12	
267	CXXXIII	200 42 9.88	4.7235611,7	CXXXV				20 44 4.48	
	CXXXV	159 45 6.28	5.1497403,2	CXXXVIII	32 17 48.09	70 50 47.88		339 40 3.66	
	"	246 16 13.68	4.8624255,8	CXXXVII				66 23 3.87	
	CXXXIX	137 24 7.45	4.7520600,2	CXXXVII				317 20 12.34	
	"	211 47 11.15	4.8011524,5	CXL	32 2 47.82	71 27 3.21		31 50 36.19	
268	CXL	80 23 46.04	4.8609174,3	CXXXVII				260 16 25.09	
	"	160 56 50.56	5.1636871,0	CXLI	32 25 31.07	71 17 47.97		340 51 54.39	
	"	221 50 50.21	5.3854207,5	CXLIV	32 32 34.47	71 58 36.43		42 7 41.73	
	CXXXVII	131 51 50.99	5.1899859,1	CXXXVIII				311 39 55.74	
	"	188 58 13.58	5.1813003,3	CXLI				9 0 40.83	
269	CXLIV	78 39 3.45	5.3304689,5	CXLI				258 17 8.45	
	"	149 17 46.04	5.2228149,1	CXLIII	32 56 14.55	71 41 55.58		329 8 44.75	
	"	198 39 0.45	5.1973541,0	CXLV	32 57 11.01	72 8 27.68		18 44 20.29	



Fixed Station A				Deduced Station B					
Circuit No.	Series No.	Azimuth of B	A to B in Log. feet	Circuit No.	Series No.	Latitude North	Longitude East of Greenwich	Azimuth of A	
		° ' "				° ' "	° ' "	° ' "	
269	CXLIV	234 37 56.01	5.2204772,0	271	CXLVII	32 48 23.30	72 25 3.94	54 52 13.06	
	CXLI	71 30 41.75	5.1661690,7		CXXXVIII				251 16 14.59
	"	166 45 20.77	5.2023332,1		CXLII	32 51 5.70	71 10 40.00		346 41 29.95
	"	213 28 43.02	5.3495355,2		CXLIII				33 41 44.69
	CXXXVIII	206 43 3.76	5.3544454,7		CXLII				26 53 45.60
	CXLII	258 48 49.90	5.2119885,1		CXLIII				79 5 48.52
270	CXLV	87 42 43.32	5.1328379,7		CXLIII				267 28 17.47
"	"	157 39 53.36	5.0826162,5		CXLVI	33 15 37.69	71 59 26.31		337 34 57.66
"	"	214 15 15.82	4.9665197,1		CXLVIII	33 9 47.76	72 18 40.75		34 20 50.24
"	"	302 2 39.01	5.0013228,7		CXLVII				122 11 39.85
271	CXLIII	217 10 0.61	5.1692914,4	CXLVI				37 19 34.40	
	CXLVIII	109 55 3.31	5.0180918,0	CXLVI				289 44 30.98	
	"	183 7 42.17	5.2550102,5	(XVII)	33 39 24.98	72 20 36.90		3 8 46.13	
	"	232 3 34.29	5.1269032,8	(XIX)	33 23 20.85	72 39 26.67		52 14 57.90	
	"	297 35 2.06	5.1193507,1	CXLIX	32 59 42.58	72 41 30.71		117 47 29.79	
272	"	345 51 30.40	5.1266196,2	CXLVII				165 54 59.01	
	CXLVI	216 37 51.61	5.2552393,9	(XVII)				36 49 32.14	
	CXLVII	230 42 34.74	5.0357464,7	CXLIX				50 51 30.74	
	(XIX)	135 37 25.74	5.1352438,7	(XVII)				315 27 1.80	
	"	177 40 37.80	5.1519985,7	(XV)	33 46 43.69	72 38 18.53		357 40 0.10	
	"	219 33 30.31	5.2153750,2	(XVIII)	33 44 11.66	73 0 5.08		39 44 54.97	
	"	355 47 6.70	5.1575313,6	CXLIX				175 48 14.61	
	(XVII)	195 59 6.27	4.9391981,4	(XIII)	33 53 11.75	72 25 20.92		16 1 44.15	
	"	243 36 15.55	5.0001307,0	(XV)				63 46 4.87	
	(XV)	120 56 23.06	4.8832213,4	(XIII)				300 49 10.10	
272	"	153 17 19.91	4.8492312,1	(XIV)	33 57 8.09	72 32 1.40		333 13 49.76	
	"	211 28 55.28	4.8597420,5	(XVI)	33 56 54.33	72 45 47.40		31 33 5.40	
	"	277 49 49.30	5.0467509,0	(XVIII)				98 1 55.32	
	(XIII)	234 40 26.31	4.6164274,0	(XIV)				54 44 9.79	
	(XIV)	271 4 52.74	4.8425397,4	(XVI)				91 12 34.04	
	(XVI)	316 45 18.85	5.0241198,2	(XVIII)				136 53 16.49	

NOTE.—(XIII) to (XIX) appertain to base-line figures.

J. B. N. HENNESSEY.

PRINCIPAL TRIANGULATION. DIFFERENCES OF HEIGHT.

GREAT INDUS SERIES.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1855	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference	Angle in seconds				
Oct.	17	<i>h</i> 3 <i>m</i> 4	Manora Point	E 0 27 38.8	4							0' 0" 0"		
"	24	3 2	A: H.S.	D 0 34 12.0	4	2	451	2.75	4.72	1.97	+ 8.9	38 .084	0 30 54.8	+ 410.6
"	17	3 16	Manora Point	E 0 14 13.1	4									
"	19	3 6	Mutrani H.S.	D 0 21 27.8	4	2	469	2.75	4.72	1.97	+ 8.6	26 .055	0 17 50.4	+ 246.3
May	19	2 47	A: H.S.	D 0 19 25.5	4									
"	5	2 49	Mutrani H.S.	E 0 13 57.1	4	87	333	2.75	5.25	2.50	- 15.3	18 .054	0 16 41.2	- 163.6
"	5	2 39	Mutrani H.S.	D 0 29 35.9	4									
"	16	2 38	Karachi Obsy.	E 0 24 43.4	4	53	270	2.71	5.25	2.54	+ 19.1	- 2 .007	0 27 19.2	- 217.5
"	19	2 19	A: H.S.	D 0 39 18.6	4									
"	16	2 21	Karachi Obsy.	E 0 33 36.3	4	87	355	2.79	5.25	2.46	+ 14.1	13 .037	0 36 34.6	- 381.7
"	19	3 2	A: H.S.	E 0 19 26.5	4									
"	18	3 3	(XXII)	D 0 24 5.1	4	87	263	2.83	5.25	2.42	+ 18.8	11 .042	0 21 45.7	+ 168.5
				D 0 24 5.1	4			2.79	5.25	2.46	- 19.1			

NOTE.— (XXII) appertains to base-line figures.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1855	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
May 5	3 0	Mutrani H.S. (XXII)	E o 24 24.8	4	53	407	2.83	5.25	2.42	+12.1	19	.047	o 27 41.8	+ 332.1
" 18	2 55		D o 30 59.1	4			2.75	5.25	2.50	-12.5				
" 18	2 48	(XXII)	D o 25 11.2	4	122	598	2.50	5.25	2.75	- 9.4	28	.047	o 20 30.6	- 360.9
" 3	2 52	(XXI)	E o 15 59.2	4			5.19	5.25	0.06	+ 0.2				
" 5	3 14	Mutrani H.S. (XXI)	D o 6 20.9	4	53	528	2.58	5.25	2.67	-10.3	4	.008	o 1 50.3	- 28.6
" 3	3 11		D o 2 29.5	4			5.38	5.25	0.13	+ 0.5				
" 8	5 29	(XXI)	D o 18 0.7	4	46	382	1.24	5.00	3.76	-20.1	-42	.110	o 13 47.7	- †155.0
" 8	5 28	(XX)	E o 9 33.4	4			1.24	5.25	4.01	+21.4				
Mar. 18	3 21	(XXII)	D o 35 10.4	4	122	573	1.24	5.25	4.01	-14.3	25	.044	o 30 34.2	- 516.1
" 15	3 23	(XX)	E o 25 58.0	4			1.24	5.25	4.01	+14.3				
" 17	3 37	(XXII)	E o 3 29.2	4	122	730	1.24	5.25	4.01	+11.2	39	.053	o 9 6.1	+ 195.5
April 21	3 43	(XXIV)	D o 14 42.9	4			1.24	5.25	4.01	-11.2				
Feb. 28	3 53	(XXI)	E o 16 35.0	4	46	824	1.24	5.25	4.01	+ 9.9	37	.045	o 23 0.1	+ 557.7
April 21	3 50	(XXIV)	D o 29 25.1	4			1.24	5.25	4.01	- 9.9				
Feb. 28	3 27	(XXI)	E o 13 34.1	4	46	517	1.24	5.25	4.01	+15.8	26	.050	o 17 42.1	+ 269.3
" 26	3 26	(XXIII)	D o 21 50.0	4			1.24	5.25	4.01	-15.8				
Mar. 6	3 31	(XX)	E o 17 54.6	4	14	625	1.24	5.25	4.01	+13.1	25	.040	o 22 55.4	+ 421.6
Feb. 27	3 32	(XXIII)	D o 27 56.1	4			1.24	5.25	4.01	-13.1				
" 28	3 45	(XXI)	E o 31 35.2	4	46	783	1.24	5.25	4.01	+10.4	35	.045	o 37 42.1	+ 868.7
April 19	4 10	(XXV)	D o 43 49.0	4			1.24	5.25	4.01	-10.4				
Feb. 26	3 33	(XXIII)	E o 17 13.6	4	102	858	1.24	5.25	4.01	+ 9.5	51	.059	o 23 40.7	+ 598.3
April 19	3 36	(XXV)	D o 30 7.7	4			1.24	5.25	4.01	- 9.5				
" 21	4 0	(XXIV)	E o 5 15.9	4	162	882	1.24	5.25	4.01	+ 9.3	47	.053	o 11 59.2	+ 311.3
" 19	3 59	(XXV)	D o 18 42.5	4			1.24	5.25	4.01	- 9.3				
Nov. 19	2 38	(XXIV)	E o 30 9.9	4	162	734	1.24	5.25	4.01	+11.1	47	.064	o 35 40.7	+ 771.0
Dec. 8, 9	2 39	I	D o 41 11.4	8			1.24	5.25	4.01	-11.1				
Nov. 14, 16	2 52	(XXV)	E o 13 54.8	8	227	788	1.24	5.25	4.01	+10.4	46	.058	o 19 53.5	+ 461.3
Dec. 8	2 51	I	D o 25 52.2	4			1.24	5.25	4.01	-10.4				

NOTE.—(XX) to (XXV) appertain to base-line figures.

† Superseded by Spirit Leveled value.

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Sta. - 1st. Sta. in feet
1853	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Nov. 19	h 29	(XXIV)	E 0 53 55.0	4	+		1'24	5'25	4'01	+ 7.8				
" 26	2 30	II	D 1 9 12.1	4	162	1045	1'24	5'25	4'01	- 7.8	72	.069	1 1 33.6	+ 1893.7
Dec. 8,9	2 48	I	E 0 38 39.7	8			1'24	5'25	4'01	+ 9.6				
Nov. 26	2 44	II	D 0 51 12.4	4	323	850	1'24	5'25	4'01	- 9.6	58	.068	0 44 56.1	+ 1124.8
" 25,26	2 59	II	D 0 44 55.9	8			1'24	5'25	4'01	- 8.1				
Dec. 2,3	2 38	IV	E 0 30 2.5	8	556	1012	1'24	5'25	4'01	+ 8.1	67	.066	0 37 29.2	- 1117.2
" 8	3 4	I	D 0 5 16.1	4			1'24	5'25	4'01	- 11.0				
" 1,2	3 32	IV	D 0 6 1.2	8	323	744	1'24	5'25	4'01	- 11.0	44	.059	0 0 22.6	+ 8.2
" 8	3 9	I	D 0 6 14.6	4			1'24	5'25	4'01	- 8.9				
" 13	3 10	III	D 0 7 35.1	4	323	917	1'24	5'25	4'01	- 8.9	53	.058	0 0 40.3	+ 18.1
Nov. 14,16	3 2	(XXV)	E 0 7 43.0	8			1'24	5'25	4'01	+ 7.8				
Dec. 12	2 55	III	D 0 23 20.6	4	227	1050	1'24	5'25	4'01	- 7.8	64	.061	0 15 31.8	+ 480.0
" 1,2,3	3 13	IV	D 0 5 23.3	12			1'24	5'25	4'01	- 10.8				
" 12	3 1	III	D 0 6 13.8	4	325	757	1'24	5'25	4'01	- 10.8	41	.054	0 0 25.3	+ 9.4
Nov. 26	2 51	II	E 0 7 37.8	4			1'24	5'25	4'01	+ 6.7				
Dec. 24	3 2	V	D 0 25 35.7	4	556	1214	1'24	5'25	4'01	- 6.7	75	.062	0 16 36.8	+ 594.1
" 2,5	2 56	IV	E 0 47 7.3	8			1'24	5'25	4'01	+ 7.7				
" 24	2 55	V	D 1 2 40.9	4	325	1059	1'24	5'25	4'01	- 7.7	70	.066	0 54 54.1	+ 1712.6
" 2,3,5	2 50	IV	E 0 16 32.7	12			1'24	5'25	4'01	+ 8.8				
" 19	2 53	VI	D 0 30 27.4	4	325	929	1'24	5'25	4'01	- 8.8	56	.060	0 23 30.1	+ 642.8
" 12,13	3 0	III	E 0 11 3.2	8			1'24	5'25	4'01	+ 7.4				
" 19	2 43	VI	D 0 27 36.1	4	327	1111	1'24	5'25	4'01	- 7.4	66	.059	0 19 19.7	+ 632.3
" 24	3 9	V	D 0 38 33.6	4			1'24	5'25	4'01	- 6.7				
" 17	3 1	VI	E 0 20 37.7	4	680	1225	1'24	5'25	4'01	+ 6.7	81	.066	0 29 35.7	- 1067.9
" 24	3 24	V	E 0 22 59.1	4			1'24	5'25	4'01	+ 9.2				
" 30	3 30	VII	D 0 36 18.1	4	680	884	1'24	5'25	4'01	- 9.2	52	.059	0 29 38.6	+ 772.0
" 17	3 9	VI	E 0 30 53.3	4			1'24	5'25	4'01	+ 5.5				
" 30	3 6	VII	D 0 52 45.8	4	458	1493	1'24	5'25	4'01	- 5.5	96	.064	0 41 49.6	+ 1838.9

NOTE.—(XXIV) and (XXV) appertain to base-line figures.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1853-54	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
1855-56							Signal	Instrument	Difference					
Dec. 24	h 3 m 17	V	0 1 58.9	4	+							0 1 58.9		
Jan. 9	2 10	VIII	D 0 19 55.9	4	680	1486	1.24	5.25	4.01	- 5.5	91	.061	0 8 58.5	+ 392.8
Dec. 19	3 8	VI	E 0 32 30.8	4			1.24	5.25	4.01	+ 6.8				
Jan. 9	2 18	VIII	D 0 50 18.2	4	458	1196	1.24	5.25	4.01	- 6.8	71	.059	0 41 24.5	+ 1458.3
Dec. 30	2 50	VII	D 0 20 42.2	4			1.24	5.25	4.01	- 8.6				
Jan. 9	2 51	VIII	E 0 6 29.6	4	841	949	1.24	5.25	4.01	+ 8.6	57	.060	0 13 35.9	- 380.0
Dec. 30	3 5	VII	D 0 23 57.9	12			1.24	5.25	4.01	- 5.1				
Jan. 25	3 3	IX	E 0 0 24.9	4	841	1599	1.24	5.25	4.01	+ 5.1	98	.061	0 12 11.4	- 573.9
Jan. 9	2 42	VIII	D 0 16 17.6	4			1.24	5.25	4.01	- 4.7				
" 25	2 42	IX	D 0 8 44.4	4	762	1755	1.24	5.25	4.01	- 4.7	131	.075	0 3 46.6	- 195.2
Dec. 30	3 15	VII	D 0 40 36.1	4			2.62	5.25	2.63	- 3.8				
Jan. 17	3 24	X	E 0 19 54.5	4	841	1403	1.24	5.25	4.01	+ 5.8	86	.061	0 30 16.3	- 1251.2
" 9	2 31	VIII	D 0 34 50.4	4			1.24	5.25	4.01	- 7.4				
" 17	2 41	X	E 0 18 41.6	4	762	1102	1.24	5.25	4.01	+ 7.4	74	.067	0 26 46.0	- 868.3
Jan. 25	2 52	IX	D 0 34 32.5	4			1.24	5.25	4.01	- 9.8				
" 17,18	3 12	X	E 0 21 46.7	8	722	832	1.24	5.25	4.01	+ 9.8	43	.052	0 28 9.6	- 690.3
Dec. 10	2 54	IX	D 1 26 37.5	4			2.79	5.25	2.46	- 6.1				
" 20	2 50	XI	E 1 14 21.8	4	722	829	2.75	5.25	2.50	+ 6.2	53	.064	1 20 29.7	- 1965.0
" 3	2 55	X	D 0 42 2.3	4			2.79	5.25	2.46	- 3.7				
" 21	2 59	XI	E 0 22 30.2	4	580	1349	2.68	5.25	2.57	+ 3.9	92	.068	0 32 16.4	- 1282.2
" 10	2 40	IX	D 2 0 4.5	4			2.92	5.25	2.33	- 4.8				
" 15	2 40	XII	E 1 45 41.9	4	722	989	2.75	5.25	2.50	+ 5.2	68	.069	1 52 53.4	- 3290.0
" 3	3 6	X	D 1 42 53.5	4			2.08	5.25	3.17	- 7.0				
" 18	2 59	XII	E 1 29 28.7	4	580	920	2.67	5.25	2.58	+ 5.7	64	.070	1 36 10.5	- 2605.8
" 20	2 26	XI	D 1 4 26.6	4			2.92	5.25	2.33	- 6.2				
" 15,17	2 54	XII	E 0 53 23.5	8	314	764	2.83	5.25	2.42	+ 6.5	57	.075	0 58 55.2	- 1325.1
" 20	2 33	XI	E 0 10 39.2	4			2.81	5.25	2.44	+ 6.2				
Jan. 3	2 31	XIII	D 0 22 28.2	4	314	801	2.79	5.25	2.46	- 6.3	52	.065	0 16 33.7	+ 390.5

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet
1855-56	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
Dec. 17	h 2 m 7	XII	E o 34 41.7	4			2.81	5.25	2.44	+ 3.8				
Jan. 4	2 5	XIII	D o 53 38.6	4	38	1318	2.88	5.25	2.37	- 3.7	94	.071	o 44 10.2	+ 1714.7
Dec. 20	2 13	XI	D o 58 35.7	4			2.75	5.25	2.50	- 6.2				
" 24	2 14	XIV	E o 46 30.4	4	314	825	2.78	5.25	2.47	+ 6.1	56	.068	o 52 33.0	- 1277.1
" 27	4 25	XII	D o 3 39.8	4			2.85	4.88	2.03	- 5.1				
" 27	4 8	XIV	D o 8 4.4	8	38	805	2.86	5.25	2.39	- 6.1	56	.070	o 2 11.8	+ 52.1†
Jan. 4	2 32	XIII	D I 21 52.8	4			2.73	5.25	2.52	- 6.9				
Dec. 24	2 34	XIV	E I 11 9.3	4	395	740	2.81	5.25	2.44	+ 6.7	55	.074	I 16 31.0	- 1667.6
Jan. 3	2 22	XIII	D o 44 2.3	4			2.79	5.25	2.46	- 8.2				
" 14	2 23	XV	E o 34 50.6	4	395	610	2.71	5.25	2.54	+ 8.5	38	.062	o 39 26.6	- 708.0
Dec. 27	2 15	XIV	E o 26 2.4	4			2.79	5.25	2.46	+ 5.1				
Jan. 14	2 14	XV	D o 40 21.7	4	42	980	2.72	5.25	2.53	- 5.3	66	.067	o 33 12.0	+ 958.7
" 3	2 0	XIII	D I 15 16.9	4			2.76	5.25	2.49	- 6.2				
" 11	2 0	XVI	E I 3 23.3	4	395	824	2.71	5.25	2.54	+ 6.3	61	.074	I 9 20.2	- 1682.0
Dec. 26	2 18	XIV	D o 5 50.1	4			2.73	5.25	2.52	- 8.2				
Jan. 5	2 17	XVI	D o 4 17.6	4	42	623	2.72	5.25	2.53	- 8.3	16	.026	o 0 46.3	- 14.1†
Jan. 14	2 31	XV	D o 59 52.3	4			2.67	5.25	2.58	- 8.8				
" 11	2 30	XVI	E o 51 10.2	4	248	595	2.79	5.25	2.46	+ 8.4	45	.076	o 55 31.1	- 973.0
" 14	2 6	XV	D o 34 8.1	4			2.78	5.25	2.47	- 6.6				
" 29	2 2	XVII	E o 22 49.1	4	248	768	2.83	5.25	2.42	+ 6.4	51	.066	o 28 28.5	- 643.9
" 11	2 10	XVI	E o 4 54.3	4			2.78	5.25	2.47	+ 5.4				
" 29	2 11	XVII	D o 18 48.9	4	46	939	2.73	5.25	2.52	- 5.5	58	.062	o 11 51.6	+ 328.1
" 14	I 59	XV	D o 49 12.6	4			2.68	5.25	2.57	- 6.5				
" 17	2 0	XVIII	E o 37 23.8	4	248	809	2.83	5.25	2.42	+ 6.1	56	.069	o 43 18.0	- 1032.2
" 11	2 21	XVI	D o 8 14.8	4			2.68	5.25	2.57	- 9.2				
" 17	2 23	XVIII	D o 1 23.2	4	46	567	2.73	5.25	2.52	- 9.1	4	.007	o 3 25.8	- 57.2†
Jan. 29	2 21	XVII	D o 27 42.9	4			2.68	5.25	2.57	- 9.3				
" 17	2 12	XVIII	E o 19 1.8	4	114	563	2.78	5.25	2.47	+ 8.9	30	.053	o 23 22.2	- 387.5

† Superseded by Spirit Levelled values.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1856	Mean of Times of observation						Height in feet			Angle in Seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
	<i>h m</i>		<i>° ' "</i>		<i>+</i>							<i>° ' "</i>		
Jan. 29	2 42	XVII	E 0 5 36.9	4			2.88	5.25	2.37	+ 8.1				
Feb. 9	2 41	XIX	D 0 14 35.6	4	114	597	2.67	5.25	2.58	- 8.8	38	.064	0 10 5.9	+ 177.5
Jan. 21	2 2	XVIII	E 0 11 50.3	4			2.88	5.25	2.37	+ 4.8				
Feb. 9	1 58	XIX	D 0 26 36.0	4	33	997	2.68	5.25	2.57	- 5.3	61	.061	0 19 12.9	+ 564.3
Jan. 29	2 33	XVII	D 0 24 48.7	4			2.79	5.25	2.46	- 7.9				
Feb. 1	2 34	XX	E 0 15 11.5	4	114	633	2.67	5.25	2.58	+ 8.3	36	.057	0 20 0.3	- 373.0
"	3 4 39	XVIII	D 0 4 21.0	4			2.69	4.75	2.06	- 6.6				
"	3 4 44	XX	D 0 5 53.7	6	33	639	2.68	5.25	2.57	- 8.2	20	.031	0 0 45.6	+ 14.3†
"	9 2 8	XIX	D 0 37 22.6	4			2.83	5.25	2.42	- 8.8				
"	1 2 8	XX	E 0 28 54.8	4	151	562	2.88	5.25	2.37	+ 8.6	36	.064	0 33 8.6	- 548.6
"	9 2 27	XIX	D 0 31 58.0	4			2.73	5.25	2.52	- 7.5				
"	14 2 29	XXI	E 0 21 53.0	4	151	682	2.90	5.25	2.35	+ 7.0	46	.067	0 26 55.3	- 540.8
"	1 2 42	XX	D 0 5 56.9	4			2.73	5.25	2.52	- 7.1				
"	18 2 44	XXI	D 0 7 23.0	4	36	725	2.82	5.25	2.43	- 6.8	-31	.043	0 0 43.2	+ 15.4†
"	9 2 17	XIX	D 0 8 59.4	4			2.63	5.25	2.62	- 8.5				
"	10 2 17	XXII	D 0 0 42.1	4	151	627	2.90	5.25	2.35	- 7.6	31	.049	0 4 8.2	- 76.4
"	14 2 42	XXI	E 0 24 33.6	4			2.63	5.25	2.62	+ 9.7				
"	10 2 41	XXII	D 0 32 46.5	4	38	550	2.73	5.25	2.52	- 9.3	38	.069	0 28 40.3	+ 464.7
Feb. 10	2 26	XXII	D 0 26 2.3	4			2.90	5.25	2.35	- 6.0				
Mar. 31	2 20	XXIV	E 0 14 17.2	4	135	796	2.71	5.25	2.54	+ 6.5	52	.065	0 20 10.0	- 472.7
Mar. 25 } Feb. 15, 24 }	2 34	XXI	D 0 5 19.0	12			2.90	5.25	2.35	- 8.8				
Mar. 29	2 33	XXIV	D 0 4 12.9	4	38	543	2.88	5.25	2.37	- 8.9	- 6	.011	0 0 33.1	- 8.8†
Fb. 16, 24	2 49	XXI	D 0 7 2.9	8			2.46	5.25	2.79	- 9.2				
"	28 2 50	XXIII	D 0 4 53.5	4	38	615	2.74	5.25	2.51	- 8.3	-42	.068	0 1 4.3	- 19.4
"	1, 7 2 22	XX	D 0 5 51.2	8			2.46	5.25	2.79	- 10.2				
"	28 2 21	XXIII	D 0 4 22.5	4	36	556	2.82	5.25	2.43	- 8.9	-19	.034	0 0 43.7	- 11.9
"	19 4 32	XXI	D 0 6 1.8	11			2.79	5.25	2.46	- 7.7				
"	19 4 32	XXV	D 0 4 10.8	6	38	653	2.81	4.75	1.94	- 6.1	27	.041	0 0 54.7	- 17.5

† Superseded by Spirit Levelled values.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet
1856	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Feb. 29	<i>h m</i> 2 26	XXIII	D ° 4 26.9	4	+		3.50	5.25	1.75	- 6.6		0 ' "		
Mr. 24,25	2 33	XXV	D ° 6 8.8	8	33	543	10.92	5.25	5.67	+ 21.3	-54	.099	0 1 4.9	+ 17.3
Mar. 31	2 49	XXIV	D ° 5 52.5	4			11.46	5.25	6.21	+ 20.7				
" 21	2 50	XXV	D ° 5 44.8	4	36	613	2.87	5.25	2.38	- 7.9	-49	.080	0 0 18.2	- 5.5
" 29	2 41	XXIV	D ° 5 13.9	4			2.73	5.25	2.52	- 8.7				
" 17,19	3 11	XXVI	D ° 6 34.0	8	36	589	2.88	5.25	2.37	- 8.2	-51	.087	0 0 40.3	+ 11.7†
" 20	2 28	XXV	D ° 4 57.5	4			2.73	5.25	2.52	- 9.5				
" 17	2 21	XXVI	D ° 6 11.2	4	36	540	2.67	5.25	2.58	- 9.7	-55	.102	0 0 36.8	+ 9.8
" 29	2 49	XXIV	D ° 4 0.7	4			2.82	5.25	2.43	- 9.2				
Apl. 2	2 52	XXVII	D ° 5 40.3	4	36	536	0.00	5.25	5.25	- 20.0	- 8	.015	0 0 44.4	+ 11.7
Mar. 10	2 47	XXVI	D ° 4 38.1	4			2.82	5.25	2.43	- 9.2				
April 2	2 45	XXVII	D ° 5 12.5	4	32	538	2.73	5.25	2.52	- 9.6	-17	.032	0 0 17.0	+ 4.5
April 4	2 41	XXVII	D ° 6 4.7	4			10.50	5.25	5.25	+ 16.6				
" 7	2 44	XXIX	D ° 6 2.1	4	39	643	11.94	5.25	6.69	+ 21.2	-61	.095	0 0 1.0	+ 0.3
Mr. 10,17	2 20	XXVI	D ° 4 35.6	8			2.69	5.25	2.56	- 11.2				
April 6	2 11	XXIX	D ° 4 51.3	4	32	464	2.73	5.25	2.52	- 11.1	-40	.086	0 0 7.9	+ 1.8†
Mar. 17	2 42	XXVI	D ° 4 37.9	4			2.85	5.25	2.40	- 9.8				
" 4	2 37	XXVIII	D ° 4 29.9	4	32	499	2.68	5.25	2.57	- 10.5	-14	.028	0 0 4.4	- 1.1
" 24	2 51	XXV	D ° 2 32.8	4			2.85	5.25	2.40	- 12.2				
" 4	2 51	XXVIII	D ° 4 50.4	4	36	401	3.50	5.25	1.75	- 8.9	-11	.027	0 1 10.5	+ 13.9
" 10	2 37	XXVI	D ° 1 50.1	4			2.73	5.25	2.52	- 10.0				
" 8	2 36	XXX	D ° 6 47.8	4	32	514	2.68	5.25	2.57	- 10.2	8	.016	0 2 28.8	+ 37.6
" 4	2 44	XXVIII	D ° 0 24.2	4			2.72	5.25	2.53	- 12.6				
" 8	2 45	XXX	D ° 6 28.8	4	38	408	2.85	5.25	2.40	- 12.0	10	.025	0 3 2.6	+ 36.6
April 6	2 25	XXIX	D ° 2 37.8	4			2.87	5.25	2.38	- 9.1				
Mar. 8	2 26	XXX	D ° 6 54.2	4	32	533	2.69	5.25	2.56	- 9.8	-10	.019	0 2 7.9	+ 33.4
Nov. 16	2 33	XXIX	D ° 4 11.0	4			2.88	5.35	2.47	- 8.9				
" 26	3 5	XXXI	D ° 5 57.5	4	32	569	2.83	5.34	2.51	- 9.0	-11	.019	0 0 53.2	+ 14.9

† Superseded by Spirit Leveled values.



Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1858	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Nov. 18	2 33	XXX	D o 5 28.2	4			2.88	5.38	2.50	- 9.4				
" 25	2 44	XXXI	D o 3 6.3	4	46	541	2.94	5.34	2.40	- 9.0	22	.041	o 1 10.8	- 18.8
" 15	2 50	XXIX	D o 4 22.6	4			2.88	5.35	2.47	- 8.3				
Dec. 1	2 58	XXXII	D o 6 19.8	4	32	608	2.83	5.38	2.55	- 8.5	- 9	.015	o o 58.5	+ 17.5†
Nov. 25	2 24	XXXI	D o 4 27.0	4			13.25	5.34	7.91	+ 26.8				
Dec. 2	2 19	XXXII	D o 4 8.9	4	42	602	18.25	5.38	12.87	+ 43.6	8	.013	o o o 7	- 0.2
Nov. 30	2 36	XXXII	D o 4 32.6	4			2.83	5.38	2.55	- 9.7				
Dec. 6	2 28	XXXV	D o 4 37.5	4	35	535	2.83	5.35	2.52	- 9.6	2	.004	o o o 2.5	+ 0.7
Nov. 25	2 16	XXXI	D o 4 46.1	4			2.83	5.34	2.51	- 9.3				
Dec. 6	2 19	XXXV	D o 5 27.3	4	42	550	2.88	5.35	2.47	- 9.2	- 22	.040	o o o 20.7	+ 5.6
Nov. 25	2 8	XXXI	D o 4 38.5	4			2.83	5.34	2.51	- 10.3				
" 22	2 17	XXXIII	D o 4 3.9	4	42	499	2.88	5.35	2.47	- 10.1	- 2	.004	o o o 17.2	- 4.2
" 18	2 42	XXX	D o 5 33.1	4			2.90	5.38	2.48	- 10.1				
" 22	2 34	XXXIII	D o 2 33.3	4	46	500	2.94	5.35	2.41	- 9.8	17	.034	o 1 29.8	- 22.1
" 25	2 33	XXXI	D o 4 13.2	4			2.90	5.34	2.44	- 10.2				
Dec. 10	2 32	XXXIV	D o 4 23.1	4	42	489	2.88	5.33	2.45	- 10.2	- 3	.006	o o o 5.0	+ 1.2
Nov. 23	2 17	XXXIII	D o 5 9.9	4			2.90	5.35	2.45	- 8.0				
Dec. 11	2 34	XXXIV	D o 5 22.2	4	41	621	14.00	5.33	8.67	+ 28.5	- 16	.026	o o o 24.4	+ 7.4
" 6	2 37	XXXV	D o 4 11.6	4			2.90	5.35	2.45	- 11.3				
" 10	2 39	XXXIV	D o 3 51.5	4	43	441	2.90	5.33	2.43	- 11.2	- 10	.023	o o o 10.0	- 2.2*
" 2	2 41	XXXII	D o 5 12.3	4			2.83	5.38	2.55	- 7.8				
" 28	2 40	XXXVI	D o 6 40.1	4	35	664	2.88	5.36	2.48	- 7.6	- 17	.026	o o o 44.0	+ 14.3†
" 6	2 57	XXXV	D o 2 23.4	4			2.83	5.35	2.52	- 13.5				
" 28	2 57	XXXVI	D o 4 20.2	4	43	380	2.90	5.36	2.46	- 13.2	2	.005	o o o 58.6	+ 10.9
" 6	2 51	XXXV	D o 3 12.3	4			2.92	5.35	2.43	- 10.1				
" 15	2 48	XXXVII	D o 5 30.5	4	43	490	2.90	5.38	2.48	- 10.3	- 6	.012	o 1 9.0	+ 16.6
" 10	2 24	XXXIV	D o 4 5.0	4			2.92	5.33	2.41	- 8.8				
" 12	2 27	XXXVII	D o 6 1.2	4	43	558	2.90	5.38	2.48	- 9.1	- 15	.027	o o o 58.0	+ 15.9

† Superseded by Spirit Levelled values. \* Rejected.

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st. Stn. in feet
1858-59	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
Dec. 28	<i>h</i> 2 <i>m</i> 26	XXXVI	D o 4 18.6	4	+		2.83	5.36	2.53	-10.2		o o 14.1	+ 3.5	
" 13	2 33	XXXVII	D o 4 46.6	4	45	507	2.88	5.38	2.50	-10.0	-9	.018	o o 14.1	+ 3.5
" 28	2 49	XXXVI	D o 4 28.3	4			2.88	5.36	2.48	-9.1				
Jan. 5	2 46	XXXVIII	D o 5 30.9	4	45	557	2.88	5.25	2.37	-8.7	-12	.022	o o 31.5	+ 8.6†
Dec. 15	2 5	XXXVII	D o 6 9.1	4			2.88	5.38	2.50	-7.8				
Jan. 2	2 4	XXXVIII	D o 6 47.7	4	46	655	2.91	5.25	2.34	-7.3	-53	.081	o o 19.6	+ 6.3
Dec. 28	2 15	XXXVI	D o 5 13.9	4			2.83	5.36	2.53	-10.9				
" 19	2 21	XXXIX	D o 3 24.9	4	45	474	2.88	5.37	2.49	-10.7	-12	.025	o o 54.4	- 12.7
Jan. 4	2 22	XXXVIII	D o 5 25.3	4			2.83	5.25	2.42	-11.4				
Dec. 19	2 16	XXXIX	D o 2 14.9	4	47	433	2.88	5.37	2.49	-11.7	-2	.005	o I 35.4	- 20.3
" 20	2 43	XXXIX	D o 5 3.9	4			2.83	5.37	2.54	-9.8				
Jan. 22	2 40	XLI	D o 5 56.3	4	43	527	2.88	5.37	2.49	-9.6	-57	.108	o o 26.3	+ 6.8
" 4	2 29	XXXVIII	D o 6 3.3	4			2.88	5.25	2.37	-8.9				
" 20	2 31	XLI	D o 4 44.1	4	47	542	2.90	5.37	2.47	-9.3	-44	.081	o o 39.8	- 10.6
" 20	2 23	XLI	D o 3 59.0	4			2.88	5.37	2.49	-9.4				
" 16	2 20	XLII	D o 6 43.5	4	44	541	2.88	5.33	2.45	-9.2	-41	.076	o I 22.4	+ 21.8
" 1	2 55	XXXVIII	D o 4 7.7	4			2.90	5.25	2.35	-8.8				
" 14	2 57	XLII	D o 5 33.2	4	47	542	2.90	5.33	2.43	-9.1	-11	.020	o o 42.6	+ 11.3†
" 5	3 1	XXXVIII	D o 2 36.4	4			2.90	5.25	2.35	-11.7				
" 8	2 59	XL	D o 4 16.7	4	47	408	2.90	5.35	2.45	-12.2	9	.022	o o 49.9	+ 10.0
Dec. 15	2 38	XXXVII	D o 5 9.2	4			2.90	5.38	2.48	-7.8				
Jan. 9	2 38	XL	D o 6 38.2	6	46	645	2.91	5.35	2.44	-7.7	-23	.036	o o 44.6	+ 14.1
" 11,12,14	2 16	XLII	D o 4 17.7	12			2.91	5.33	2.42	-9.9				
" 8,9	2 14	XL	D o 4 18.8	8	49	499	2.90	5.35	2.45	-10.0	I	.002	o o 0.5	+ 0.1*
" 22	3 0	XLI	D o 4 36.6	8			19.54	5.37	14.17	+46.1				
Mar. 9	2 53	XLIII	D o 6 7.4	4	44	626	22.00	5.38	16.62	+54.1	-59	.094	o o 49.4	+ 15.2
Jan. 14	2 3	XLII	D o 6 22.6	4			2.93	5.33	2.40	-8.4				
Mar. 4	2 3	XLIII	D o 5 44.9	4	49	580	2.88	5.38	2.50	-8.8	-65	.112	o o 19.1	- 5.4

† Superseded by Spirit Leveled values. \* Rejected.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stan. - 1st Stan. in feet	
1859	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc			
							Signal	Instru- ment	Difference						
Mar. 4	2 27	XLIII	D o 5 6.4	6	+	558	14.63	5.38	9.25	+33.8	-62	.111	o o o.8	+	o.2
„ 2	2 29	XLV	D o 5 13.2	6	48		13.17	5.35	7.82	+28.6					
Jan. 14	2 48	XLII	D o 4 44.1	4	49	570	20.50	5.33	15.17	+54.2	-56	.098	o o 2.2	+	o.6†
Feb. 26	2 44	XLV	D o 5 0.3	4			17.21	5.35	11.86	+42.4					
Jan. 16	2 30	XLII	D o 5 56.4	4	49	575	2.97	5.33	2.36	- 8.4	-56	.097	o o 4.4	-	1.3
Feb. 4	2 28	XLIV	D o 5 47.9	4			2.88	5.32	2.44	- 8.6					
Jan. 9	2 1	XL	D o 5 24.6	4	49	601	2.97	5.35	2.38	- 8.1	-18	.030	o o 1.6	+	o.5
Feb. 4	2 4	XLIV	D o 5 27.8	4			2.91	5.32	2.41	- 8.2					
Fy. 25, 26, 28 } Mar. 1 }	2 13	XLV	D o 5 22.3	16	42	576	16.92	5.35	11.57	+40.9	-84	.146	o o 9.1	+	2.6*
Jan. 30 } Feb. 1, 4, 7, 8 }	2 11	XLIV	D o 5 40.4	20			16.90	5.32	11.58	+40.9					
Mar. 5	3 7	XLIII	D o 4 44.0	4	48	611	11.17	5.38	5.79	+19.3	-59	.097	o 1 0.9	+	18.3
„ 17	3 3	XLVII	D o 6 30.5	4			15.71	5.35	10.36	+34.6					
Feb. 23	3 0	XLV	D o 4 28.7	4	42	576	10.93	5.35	5.58	+19.8	-61	.106	o 1 0.7	+	17.1†
Mar. 14	2 54	XLVII	D o 6 16.5	4			14.75	5.35	9.40	+33.3					
Mar. 2	1 57	XLV	D o 4 44.6	6	42	606	25.17	5.35	19.82	+66.6	-64	.106	o o 16.2	+	4.8
Feb. 14	2 5	XLVI	D o 5 17.6	4			25.00	5.38	19.62	+66.0					
Feb. 6	2 46	XLIV	D o 6 3.7	4	49	618	2.88	5.32	2.44	- 8.0	-52	.084	o o 5.1	+	1.5
„ 12	2 44	XLVI	D o 6 14.1	4			2.85	5.38	2.53	- 8.3					
Feb. 25	2 31	XLV	D o 4 24.7	4	42	620	31.00	5.35	25.65	+84.3	-73	.118	o o 33.7	+	10.2
Mar. 27	2 36	XLVIII	D o 5 35.8	4			29.83	5.33	24.50	+80.5					
Feb. 15	2 27	XLVI	D o 5 30.4	4	49	614	17.63	5.38	12.25	+40.6	-70	.114	o o 6.2	+	1.9
Mar. 26	2 22	XLVIII	D o 5 40.8	4			18.15	5.33	12.82	+42.5					
Mar. 14	2 42	XLVII	D o 5 35.2	4	44	503	11.08	5.35	5.73	+23.2	-81	.161	o o 25.7	-	6.3
„ 27	2 43	XLVIII	D o 5 16.6	4			3.00	5.33	2.33	- 9.5					
Mar. 24	2 34	XLVII	D o 4 59.2	8	44	687	15.33	5.35	9.98	+29.6	-50	.073	o 1 5.0	+	21.9†
April 15	2 28	XLIX	D o 6 53.9	6			20.42	5.33	15.09	+44.8					
Mar. 27	2 52	XLVIII	D o 4 36.8	4	50	571	2.92	5.33	2.41	- 8.6	-68	.119	o 1 25.0	+	23.8
April 9	2 54	XLIX	D o 7 26.7	4			2.94	5.33	2.39	- 8.5					

† Superseded by Spirit Leveled values. \* Rejected.

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet
1859	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Mar. 24	h 2 m 49	XLVII	D o 5 34'3	4	+		6'58	5'35	1'23	+ 3'9		o o "		
April 16	2 47	L	D o 5 58'7	4	44	642	9'00	5'36	3'64	+ 11'6	-33	'051	o o 16'1	+ 5'1
" 9	3 11	XLIX	D o 5 56'6	4			2'92	5'33	2'41	- 9'3				
" 17	3 10	L	D o 3 45'8	4	48	526	2'93	5'36	2'43	- 9'4	-19	'036	o 1 5'5	- 16'9
" 17	2 59	L	D o 4 57'7	4			2'92	5'36	2'44	- 9'0				
" 19	2 56	LII	D o 5 56'9	4	52	550	2'90	5'33	2'43	- 9'0	-43	'078	o o 29'6	+ 8'0
" 9	2 21	XLIX	D o 6 14'4	4			2'92	5'33	2'41	- 8'9				
" 18	2 20	LII	D o 5 13'9	4	48	550	2'93	5'33	2'40	- 8'9	-60	'109	o o 30'3	- 8'2
" 18,19	2 38	LII	D o 5 3'4	8			2'92	5'33	2'41	- 9'5				
" 25,26	2 37	LIII	D o 5 40'1	8	54	518	2'90	5'35	2'45	- 9'6	-53	'102	o o 18'3	+ 4'7
" 15	3 0	XLIX	D o 5 25'3	4			2'90	5'33	2'43	- 9'6				
" 26	2 58	LIII	D o 4 52'3	4	48	516	2'93	5'35	2'42	- 9'6	-41	'079	o o 16'5	- 4'2
" 9	2 38	XLIX	D o 4 58'8	4			2'83	5'33	2'50	- 10'4				
" 1	2 38	LI	D o 3 43'4	4	48	488	2'92	5'38	2'46	- 10'3	- 7	'014	o o 37'7	- 9'0
Mar. 28	3 7	XLVIII	D o 4 20'0	4			18'33	5'33	13'00	+ 42'4				
April 3	3 7	LI	D o 5 59'3	4	50	625	16'08	5'38	10'70	+ 34'9	-36	'058	o o 45'9	+ 14'1
" 25	2 26	LIII	D o 5 29'4	4			2'92	5'35	2'43	- 9'8				
" 4	2 26	LI	D o 4 37'2	4	55	506	2'90	5'38	2'48	- 10'0	-40	'079	o o 26'2	- 6'5
" 18	2 29	LII	D o 4 34'2	4			2'88	5'33	2'45	- 9'1				
" 22	2 31	LIV	D o 6 17'4	4	54	547	2'90	5'37	2'47	- 9'2	-43	'079	o o 51'6	+ 13'8
" 26	2 48	LIII	D o 5 38'5	4			2'83	5'35	2'52	- 9'7				
" 22	2 50	LIV	D o 6 38'4	4	55	528	2'92	5'37	2'45	- 9'5	-95	'180	o o 30'1	+ 7'8
" 22	2 41	LIV	D o 5 52'7	4			2'90	5'37	2'47	- 9'7				
May 9	2 41	LVI	D o 5 28'7	4	57	521	2'83	5'36	2'53	- 9'9	-70	'134	o o 12'1	- 3'1
April 26	3 17	LIII	D o 4 28'9	4			10'75	5'35	5'40	+ 20'3				
May 10	3 16	LVI	D o 5 11'6	4	55	542	16'33	5'36	10'97	+ 41'2	-50	'092	o o 31'8	+ 8'5
April 26	3 6	LIII	D o 5 45'0	4			2'88	5'35	2'47	- 7'8				
" 29	3 6	LV	D o 6 1'1	4	55	644	7'08	5'36	1'72	+ 5'4	-30	'047	o o 14'7	+ 4'6

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1859	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
April 3	h 2 m 46	LI	D ° 4 23'5	4			2'88	5'38	2'50	- 9'3				
" 29	2 46	LV	D ° 5 19'5	4	53	548	2'93	5'36	2'43	- 9'0	- 8	'015	0 0 28'2	+ 7'6
May 7,8	} 2 53	LVI	D ° 5 23'3	16			8'46	5'36	3'10	+ 10'2				
" 9,10		LV	D ° 5 30'3	8	57	617	9'00	5'36	3'64	+ 12'0	- 29	'047	0 0 4'4	+ 1'3*
Apl. 29,30	2 56													
April 21	3 1	LIV	D ° 5 23'2	4			2'90	5'37	2'47	- 9'4				
May 14	3 0	LVIII	D ° 5 51'6	8	57	538	2'83	5'38	2'55	- 9'7	- 59	'110	0 0 14'1	+ 3'7
" 9	2 29	LVI	D ° 4 55'4	4			2'90	5'36	2'46	- 9'7				
" 14	2 30	LVIII	D ° 5 0'2	4	57	519	2'85	5'38	2'53	- 9'9	- 29	'056	0 0 2'3	+ 0'6
" 8	3 4	LVI	D ° 4 31'2	4			2'93	5'36	2'43	- 8'8				
" 1	3 5	LVII	D ° 3 50'8	4	57	566	2'90	5'36	2'46	- 8'9	41	'072	0 0 20'3	- 5'6
April 29	3 16	LV	D ° 4 25'7	4			2'88	5'36	2'48	- 10'1				
May 1	3 15	LVII	D ° 4 36'1	4	55	500	2'90	5'36	2'46	- 10'0	- 11	'022	0 0 5'3	+ 1'3
" 8	3 25	LVI	D ° 3 32'3	4			2'90	5'36	2'46	- 10'3				
" 4	3 24	LIX	D ° 3 43'4	4	57	489	2'90	5'36	2'46	- 10'3	37	'076	0 0 5'6	+ 1'3
" 1	2 51	LVII	D ° 4 22'1	4			2'88	5'36	2'48	- 9'2				
" 4	2 52	LIX	D ° 4 57'1	4	56	550	2'93	5'36	2'43	- 9'0	5	'009	0 0 17'6	+ 4'8
" 14	3 9	LVIII	D ° 4 33'2	4			2'90	5'38	2'48	- 10'2				
" 4	3 9	LIX	D ° 4 17'5	4	51	496	2'90	5'36	2'46	- 10'1	- 7	'014	0 0 7'8	- 1'9
Dec. 3	2 13	LVIII	D ° 4 44'3	4			2'86	5'35	2'49	- 9'0				
" 11	2 13	LX	D ° 6 38'3	4	51	567	2'90	5'35	2'45	- 8'8	- 49	'086	0 0 57'1	+ 15'9
1859-60														
Jan. 2	2 22	LIX	D ° 3 45'7	4			2'86	5'35	2'49	- 9'4				
Dec. 6	2 25	LX	D ° 6 0'1	4	57	540	2'90	5'35	2'45	- 9'3	- 14	'026	0 1 7'3	+ 17'8
" 3	2 22	LVIII	E ° 3 31'4	4			2'90	5'35	2'45	+ 9'4				
" 14	2 25	LXI	D ° 12 8'4	4	51	531	2'90	5'33	2'43	- 9'3	16	'030	0 7 50'0	+ 122'5
" 9	2 2	LX	E ° 3 22'3	4			2'90	5'35	2'45	+ 10'3				
" 14	2 1	LXI	D ° 11 27'4	4	61	484	2'86	5'33	2'47	- 10'4	10	'021	0 7 24'8	+ 105'7
" 17	2 5	LXI	D ° 10 14'0	6			15'59	5'33	10'17	+ 34'1				
" 21	2 2	LXIII	E ° 0 40'5	4	83	607	15'58	5'36	10'22	- 34'3	- 17	'028	0 5 27'2	- 97'5

\* Rejected.

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st. Stn. in feet
1859-60	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
Dec. 11	h 2 m 44	LX	D o 4 23'9	4	+		2'90	5'35	2'45	- 9'5				
" 24	2 43	LXIII	D o 5 40'6	4	61	524	2'86	5'36	2'50	- 9'7	-31	0'059	o o 38'3	+ 9'8
" 11	2 34	LX	D o 6 32'0	2			2'91	5'35	2'44	- 9'4				
Jan. 9	2 32	LXII	D o 5 26'0	4	61	532	2'86	5'35	2'49	- 9'5	-84	0'158	o o 33'1	- 8'6
" 3	2 43	LIX	D o 4 38'1	4			17'58	5'35	12'23	+42'1				
" 9	2 43	LXII	D o 5 15'7	6	57	593	18'18	5'35	12'83	+44'1	-44	0'074	o o 19'8	+ 5'8
Dec. 11	2 52	LX	D o 5 15'2	4			9'83	5'35	4'48	+12'7				
Jan. 12	2 52	LXIV	D o 5 46'1	4	61	720	12'33	5'35	6'98	+19'7	13	0'018	o o 19'0	+ 6'7
" 7	2 26	LXII	D o 4 48'1	4			12'17	5'35	6'82	+22'6				
" 12	2 24	LXIV	D o 6 15'3	4	59	616	12'29	5'35	6'94	+22'9	-46	0'075	o o 43'8	+ 13'3
Dec. 21	2 16	LXIII	D o 5 27'7	6			2'92	5'36	2'44	- 9'1				
Jan. 11	2 13	LXIV	D o 4 51'0	4	63	546	2'90	5'35	2'45	- 9'2	-27	0'049	o o 18'4	- 4'9
Dec. 25	2 23	LXIII	D o 4 27'5	4			2'90	5'36	2'46	-10'0				
Jan. 22	2 23	LXVI	D o 5 0'5	4	63	503	2'90	5'38	2'48	-10'0	-23	0'046	o o 16'5	+ 4'1
1860														
Jan. 12	2 32	LXIV	D o 4 22'8	4			2'90	5'35	2'45	- 8'2				
" 23	2 32	LXVI	D o 5 32'2	4	62	611	2'90	5'38	2'48	- 8'3	16	0'026	o o 34'7	+ 10'4
Dec. 14,15, } 16,17 }	2 20	LXV	D o 4 33'9	30	62	640	5'01	5'21	0'20	- 0'6	31	0'048	o o 16'1	+ 5'1
" 20,21,23	2 25	LXVI	D o 5 6'2	26			5'00	5'21	0'21	- 0'7				
" 24,25, } 26,27 }	2 23	LXIII	D o 5 4'6	30			5'00	5'21	0'21	- 0'8	-18	0'032	o o 7'8	- 2'1
" 14,15, } 16,17 }	2 18	LXV	D o 4 49'0	30	63	556	5'00	5'21	0'21	- 0'8				
1859-60														
Dec. 25	2 33	LXIII	D o 5 5'4	4			2'87	5'36	2'49	-10'6				
Jan. 24	2 34	LXVII	D o 5 30'6	6	63	480	2'90	5'38	2'48	-10'5	-67	0'140	o o 12'7	+ 3'0
" 22	2 2	LXVI	D o 4 33'9	4			2'88	5'38	2'50	-11'3				
" 24	2 2	LXVII	D o 4 30'6	4	63	452	2'86	5'38	2'52	-11'4	-35	0'077	o o 1'7	- 0'4
" 24	2 12	LXVII	D o 5 25'2	4			2'90	5'38	2'48	-10'3				
" 28	2 13	LXIX,	D o 6 4'3	4	63	493	2'90	5'34	2'44	-10'1	-88	0'178	o o 19'7	+ 4'7
" 22	2 42	LXVI	D o 4 34'7	4			2'90	5'38	2'48	-11'6				
" 26	2 43	LXIX	D o 5 16'1	4	63	437	2'86	5'34	2'48	-11'6	-65	0'149	o o 20'7	+ 4'4

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1860	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Jan.	23	<i>h m</i>	° ' "		+							° ' "		
"	16	2 13	LXVI D o 4 8.1	6		436	2.87	5.38	2.51	-11.7	-16	.037	0 0 2.2	- 0.5
"	11	2 43	LXVIII D o 4 3.5	4	63		2.90	5.36	2.46	-11.5				
"	16	2 43	LXIV D o 4 38.4	4	62	518	2.91	5.35	2.44	- 9.6	-36	.069	0 0 26.1	+ 6.6
"	16	2 43	LXVIII D o 5 30.6	4			2.90	5.36	2.46	- 9.7				
"	22	2 52	LXVI D o 5 23.2	4	63	546	2.90	5.38	2.48	- 9.3	-52	.095	0 0 11.1	+ 3.0
"	31	2 52	LXX D o 5 45.4	4			2.86	5.38	2.52	- 9.4				
"	16	2 22	LXVIII D o 4 11.4	4	63	483	2.90	5.36	2.46	-10.4	-29	.060	0 0 29.2	+ 6.9
Feb.	1	2 23	LXX D o 5 10.0	4			2.87	5.38	2.51	-10.6				
Jan.	26	2 32	LXIX D o 6 2.0	4	64	507	2.91	5.34	2.43	- 9.8	-99	.195	0 0 0.7	+ 0.2
"	31	2 32	LXX D o 6 3.6	4			2.90	5.38	2.48	-10.0				
"	28	2 53	LXIX D o 4 49.6	4	64	607	21.00	5.34	15.66	+52.6	-87	.143	0 0 48.7	+ 14.5
Feb.	10	2 52	LXXI D o 6 27.1	4			21.00	5.36	15.64	+52.5				
Jan.	31	2 12	LXX D o 4 31.5	4	65	511	2.90	5.38	2.48	- 9.9	-60	.117	0 0 54.0	+ 13.5
Feb.	8	2 13	LXXI D o 6 19.6	6			2.85	5.36	2.51	-10.0				
Jan.	26	2 23	LXIX D o 2 43.3	4	64	475	2.88	5.34	2.46	-10.6	-58	.122	0 2 22.6	+ 33.2
Feb.	12	2 23	LXXII D o 7 28.5	6			2.85	5.33	2.48	-10.6				
"	8	2 42	LXXI D o 3 31.8	4	67	490	2.88	5.36	2.48	-10.3	-34	.069	0 1 17.2	+ 18.6
"	12	2 43	LXXII D o 6 6.2	6			2.83	5.33	2.50	-10.4				
"	12	2 52	LXXII D o 5 54.2	4	71	521	2.90	5.33	2.43	- 9.5	-40	.077	0 0 44.6	- 11.4
"	16	2 52	LXXIV D o 4 25.2	4			2.90	5.35	2.45	- 9.6				
Feb.	8	2 22	LXXI D o 4 2.6	4	67	460	2.90	5.36	2.46	-10.9	-47	.102	0 0 45.5	+ 10.3
"	14	2 24	LXXIV D o 5 33.9	6			2.83	5.35	2.52	-11.2				
"	14	2 42	LXXIV D o 4 35.6	4	69	503	2.89	5.35	2.46	-10.0	-19	.038	0 0 4.8	+ 1.2
"	18	2 42	LXXV D o 4 45.2	4			2.90	5.36	2.46	-10.0				
"	8	3 3	LXXI D o 4 55.2	4	67	545	2.89	5.36	2.47	- 9.2	-60	.110	0 0 46.3	+ 12.4
"	19	3 2	LXXV D o 6 12.2	4			7.08	5.36	1.72	+ 6.4				
"	8	2 32	LXXI D o 5 40.2	4	67	561	2.87	5.36	2.49	- 9.1	-44	.078	0 0 6.3	- 1.7
"	4	2 32	LXXIII D o 5 27.4	4			2.90	5.35	2.45	- 8.9				

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet
1860	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Jan. 31	2 42	LXX	D o 5 22.2	4	+		2.92	5.38	2.46	- 9.0				
Feb. 4	2 45	LXXIII	D o 6 33.2	6	65	559	2.85	5.35	2.50	- 9.1	-69	.123	o o 35.5	+ 9.7
" 19	2 22	LXXV	D o 6 1.0	4			2.87	5.36	2.49	- 8.1				
" 3	2 23	LXXIII	D o 5 4.2	4	61	624	2.89	5.35	2.46	- 8.0	-13	.021	o o 28.4	- 8.7†
" 14	2 33	LXXIV	D o 4 56.6	4			2.90	5.35	2.45	- 8.7				
" 24	2 32	LXXVI	D o 6 20.9	4	69	573	2.90	5.35	2.45	- 8.7	-44	.077	o o 42.2	+ 11.9
" 18	2 52	LXXV	D o 3 18.6	4			2.90	5.36	2.46	-10.3				
" 24	2 52	LXXVI	D o 5 26.7	4	61	487	2.83	5.35	2.52	-10.6	- 9	.018	o I 3.9	+ 15.3
1861														
Jan. 30,31	2 11	LXXV	D o 5 38.1	10			5.14	5.20	0.06	- 0.2				
Feb. 7	2 10	LXXXI	D o 4 24.6	4	61	570	5.03	5.26	0.23	- 0.8	-16	.028	o o 37.1	- 10.4†
" 19,20	3 45	LXXIII	D o 5 3.5	8			5.06	5.22	0.16	- 0.5				
" 13,14	3 46	LXXXI	D o 5 37.8	8	60	611	5.11	5.26	0.15	- 0.5	-15	.025	o o 17.2	+ 5.2†
" 11,13,14	3 28	LXXXI	D o 5 44.9	12			5.07	5.26	0.19	- 0.7				
" 22	3 53	LXXXII	D o 4 8.8	4	60	562	5.07	5.22	0.15	- 0.5	-15	.027	o o 48.0	- 13.2
" 20	3 41	LXXIII	D o 5 57.9	4			5.07	5.22	0.15	- 0.5				
" 22	3 44	LXXXII	D o 4 55.1	4	60	606	5.08	5.22	0.14	- 0.5	-23	.038	o o 31.4	- 9.3
" 9,10,11	3 10	LXXXI	D o 4 14.8	14			13.41	5.26	8.15	+27.0				
" 25,26	3 18	LXXXIV	D o 5 2.4	6	60	615	14.52	5.19	9.33	+30.9	o	.000	o o 25.8	+ 8.0†
" 22	3 25	LXXXII	D o 3 56.5	4			5.05	5.22	0.17	- 0.6				
" 25,26	3 30	LXXXIV	D o 6 7.4	6	65	580	5.03	5.19	0.16	- 0.6	-11	.019	o I 5.5	+ 18.6
" 25,26	3 8	LXXXIV	D o 5 13.2	8			5.00	5.19	0.19	- 0.7				
Mar. 2	3 4	LXXXIII	D o 4 54.0	4	62	575	5.06	5.18	0.12	- 0.4	-16	.028	o o 9.5	- 2.7†
Feb. 6	3 32	LXXXI	D o 4 37.5	4			5.03	5.26	0.23	- 0.8				
" 5	3 35	LXXVIII	D o 6 54.7	4	60	612	5.14	5.21	0.07	- 0.2	-40	.065	o I 8.9	+ 20.7
Mar. 2	2 31	LXXXIII	D o 4 15.0	4			5.03	5.18	0.15	- 0.6				
Feb. 4,5	2 1	LXXVIII	D o 5 3.0	14	63	517	5.02	5.21	0.19	- 0.8	-20	.039	o o 23.9	+ 6.1
1860														
" 24	2 22	LXXVI	D o 5 20.1	4			5.73	5.35	0.38	+ 1.4				
Mar. 9	2 22	LXXVIII	D o 4 23.6	4	72	551	2.88	5.37	2.49	- 9.2	-12	.022	o o 33.6	- 9.1

† Superseded by Spirit Leveled values.



Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1860	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Feb 18	2 32	LXXV	D o 4 50'4	4	61	626	5'67	5'36	0'31	+ 1'0	5	'008	o o 16'9	+ 5'2
Mar. 9	2 32	LXXVIII	D o 5 33'5	4			2'83	5'37	2'54	- 8'3				
Feb. 16	3 2	LXXIV	D o 4 3'9	4	69	506	2'90	5'35	2'45	- 9'9	-12	'024	o o 31'5	+ 7'8
" 28	3 2	LXXVII	D o 5 6'8	4			2'90	5'36	2'46	- 9'9				
" 24	2 42	LXXVI	D o 4 14'1	4	72	446	2'90	5'35	2'45	-11'2	7	'016	o o 27'1	- 5'9
" 28	2 42	LXXVII	D o 3 20'0	4			2'88	5'36	2'48	-11'3				
" 28	2 52	LXXVII	D o 3 32'7	4	71	485	2'88	5'36	2'48	-10'4	- 8	'016	o o 48'7	+ 11'6
Mar. 1	2 52	LXXIX	D o 5 10'1	4			2'87	5'36	2'49	-10'5				
Feb. 25	2 12	LXXVI	D o 5 12'2	4	72	572	2'88	5'35	2'47	- 8'8	-31	'054	o o 14'1	+ 4'0
Mar. 1	2 14	LXXIX	D o 5 40'3	4			2'88	5'36	2'48	- 8'8				
Feb. 24	3 2	LXXVI	D o 5 48'1	4	72	599	2'91	5'35	2'44	- 8'3	-34	'057	o o 5'9	- 1'7
Mar. 4	3 6	LXXX	D o 5 36'5	6			2'88	5'36	2'48	- 8'4				
" 9	2 52	LXXVIII	D o 4 29'8	4	70	590	2'88	5'37	2'49	- 8'6	o	'000	o o 33'8	+ 9'8
" 4	2 52	LXXX	D o 5 27'5	4			5'73	5'36	0'37	+ 1'3				
" 1,19,20	2 21	LXXIX	D o 5 39'7	12	73	543	3'95	5'28	1'33	- 5'0	-48	'088	o o 15'6	- 4'2
" 3,22	2 22	LXXX	D o 5 8'4	12			3'98	5'27	1'29	- 4'8				
" 19,20,21	1 56	LXXIX	D o 5 18'9	12	73	533	5'10	5'19	0'09	- 0'3	-42	'079	o o 10'1	- 2'6
" 16,17	1 52	LXXXV	D o 4 59'0	8			5'09	5'24	0'15	- 0'6				
" 22,26	1 20	LXXX	D o 4 42'6	10	72	539	5'10	5'18	0'08	- 0'3	-35	'065	o o 21'9	+ 5'8
" 17	2 14	LXXXV	D o 5 27'1	4			4'96	5'24	0'28	- 1'1				
" 20	1 59	LXXIX	D o 3 48'2	4	73	599	5'09	5'19	0'10	- 0'3	-33	'055	o 1 44'2	+ 30'7
" 12,13	1 55	LXXXVI	D o 7 16'8	8			5'09	5'25	0'16	- 0'5				
" 14,16,17	1 38	LXXXV	D o 2 9'5	12	73	489	5'07	5'24	0'17	- 0'7	-21	'043	o 2 16'3	+ 32'7
" 12,13	1 38	LXXXVI	D o 6 41'9	8			5'10	5'25	0'15	- 0'6				
" 12,13	1 27	LXXXVI	D o 5 11'8	8	79	457	5'06	5'25	0'19	- 0'9	-35	'077	o o 47'8	- 10'7
" 8,9	1 27	LXXXVIII	D o 3 36'2	8			5'06	5'23	0'17	- 0'8				
" 14,16,17	2 40	LXXXV	D o 3 43'0	12	73	538	5'06	5'24	0'18	- 0'7	-39	'072	o 1 25'7	+ 22'6*
" 8,9	2 55	LXXXVIII	D o 6 34'2	8			5'06	5'23	0'17	- 0'6				

\* Rejected.

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet
1860	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Mar. 15, 16, 17	1 22	LXXXV	D o 5 17.7	12			5.05	5.24	0.19	- 0.7				
" 28, 30	1 22	LXXXVII	D o 5 11.9	8	73	566	5.10	5.20	0.10	- 0.4	-31	.055	0 0 2.8	- 0.8
" 22, 26	1 55	LXXX	D o 4 45.0	8			5.07	5.18	0.11	- 0.4				
" 28, 30	1 59	LXXXVII	D o 6 13.8	8	72	627	5.02	5.20	0.18	- 0.6	-15	.024	0 0 44.3	+ 13.6*
" 16, 17	3 24	LXXXV	D o 4 58.1	8			5.07	5.24	0.17	- 0.6				
" 3, 5, 6	3 23	LXXXIX	D o 6 9.3	12	73	574	5.09	5.24	0.15	- 0.5	-46	.080	0 0 35.7	+ 10.1
" 28, 30	2 30	LXXXVII	D o 4 34.7	8			5.08	5.20	0.12	- 0.4				
" 2, 3, 5, 6	2 43	LXXXIX	D o 5 44.1	20	73	564	5.06	5.24	0.18	- 0.7	-27	.048	0 0 34.6	+ 9.6
" 7, 8, 9	2 10	LXXXVIII	D o 4 54.0	12			5.07	5.23	0.16	- 0.7				
" 2, 3, 5, 6	2 12	LXXXIX	D o 3 23.0	16	77	440	5.05	5.24	0.19	- 0.9	-28	.064	0 0 45.6	- 9.8
" 9	3 30	LXXXVIII	D o 5 14.2	4			4.97	5.23	0.26	- 1.0				
Feb. 24, 25	3 33	XC	D o 4 44.1	12	77	515	5.06	5.24	0.18	- 0.7	-41	.080	0 0 14.9	- 3.8
Mar. 2, 3, 6	1 58	LXXXIX	D o 4 27.2	12			4.97	5.24	0.27	- 1.2				
Feb. 22, 25	2 3	XC	D o 5 21.8	8	75	455	5.08	5.24	0.16	- 0.7	-66	.145	0 0 27.6	+ 6.2
Mar. 8, 9	1 55	LXXXVIII	D o 1 12.5	8			5.13	5.23	0.10	- 0.4				
Feb. 18, 20	1 53	XCI	D o 7 32.2	8	77	476	5.06	5.19	0.13	- 0.6	-24	.050	0 3 9.8	+ 44.4
" 21, 22, 25	1 39	XC	D o 2 30.7	12			5.13	5.24	0.11	- 0.4				
" 18, 20	1 35	XCI	D o 8 2.0	8	76	563	5.04	5.19	0.15	- 0.5	-34	.060	0 2 45.6	+ 45.7
" 18, 20	1 21	XCI	D o 5 51.4	8			5.10	5.19	0.09	- 0.3				
" 2, 4	1 23	XCIII	D o 4 26.4	8	86	629	5.10	5.23	0.13	- 0.4	6	.010	0 0 42.6	- 13.2
" 21, 22, 24, 25	2 23	XC	D o 0 36.2	16			5.11	5.24	0.13	- 0.7				
" 2, 4	2 22	XCIII	D o 6 31.0	8	76	401	5.03	5.23	0.20	- 1.0	-12	.030	0 2 57.3	+ 34.8
" 21, 22, 24, 25	1 25	XC	D o 4 12.0	16			5.11	5.24	0.13	- 0.6				
" 28, 29	1 19	XCII	D o 4 7.5	12	76	418	4.98	5.23	0.25	- 1.2	-40	.096	0 0 2.6	- 0.5
Mar. 1														
" 2, 3, 5, 6	1 34	LXXXIX	D o 3 13.0	16			5.09	5.24	0.15	- 0.7				
Feb. 28, 29	1 34	XCII	D o 3 56.3	12	75	433	5.13	5.23	0.10	- 0.5	2	.005	0 0 21.8	+ 4.6
Mar. 1														
Feb. 21, 24, 25	4 12	XC	D o 4 17.2	12			5.10	5.24	0.14	- 0.5				
" 7, 8	4 19	XCIV	D o 6 9.7	8	76	613	5.04	5.24	0.20	- 0.7	- 6	.010	0 0 56.2	+ 16.9

\* Rejected.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1860	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
F. 27, 28, 29 } Mar. 1 }	<i>h</i> <i>m</i> 3 9	XCII	D o 3 52.9	16			5.09	5.23	0.14	- 0.6				
Feb. 7, 8	3 7	XCIV	D o 6 0.5	8	76	513	5.09	5.24	0.15	- 0.6	-40	.078	0 1 3.8	+ 16.1
" 2, 4	1 34	XCIII	D o 5 44.9	8			5.10	5.23	0.13	- 0.5				
" 7, 8	1 36	XCIV	D o 3 24.2	8	83	535	5.10	5.24	0.14	- 0.5	- 7	.013	0 1 10.4	- 18.5
" 2	1 42	XCIII	D o 5 50.5	4			5.08	5.23	0.15	- 0.4				
Jan. 23, 24, } 26, 27 }	1 50	XCV	D o 6 47.0	16	83	715	5.04	5.23	0.19	- 0.5	-21	.029	0 0 28.2	+ 9.9
Feb. 7, 8	2 37	XCIV	D o 3 56.9	8			5.07	5.24	0.17	- 0.6				
Jan. 26, 27	2 34	XCV	D o 6 46.9	8	79	547	5.13	5.23	0.10	- 0.4	-48	.088	0 1 25.1	+ 22.8
Feb. 2, 4	2 15	XCIII	D o 5 38.1	8			5.08	5.23	0.15	- 0.5				
Jan. 31	2 14	XCVI	D o 6 5.6	4	83	666	5.03	5.23	0.20	- 0.6	-18	.027	0 0 13.7	+ 4.5
" 24, 26, } 27, 28 }	1 37	XCV	D o 4 9.7	16			5.08	5.23	0.15	- 0.6				
" 31	1 42	XCVI	D o 4 11.0	8	84	496	5.07	5.23	0.16	- 0.7	- 2	.004	0 0 0.6	+ 0.2
" 31	1 30	XCVI	D o 4 20.9	8			5.11	5.23	0.12	- 0.5				
" 12, 14, } 15, 16 }	2 0	XCVIII	D o 4 57.7	16	84	506	5.08	5.23	0.15	- 0.6	-26	.051	0 0 18.4	+ 4.6
" 24, 26, } 27, 28 }	1 22	XCV	D o 5 16.2	16			5.12	5.23	0.11	- 0.4				
" 16	1 18	XCVIII	D o 5 37.7	4	84	597	5.06	5.23	0.17	- 0.6	-28	.047	0 0 10.7	+ 3.1
" 23, 24, } 26, 27, 28 }	2 13	XCV	D o 4 57.7	20			5.10	5.23	0.13	- 0.5				
Feb. 14	2 8	XCVII	D o 3 56.3	4	84	505	5.07	5.24	0.17	- 0.7	-14	.028	0 0 30.8	- 7.6
" 7, 8, 10	2 23	XCIV	D o 4 3.7	12			5.10	5.24	0.14	- 0.5				
" 14	2 23	XCVII	D o 6 6.1	4	79	572	5.10	5.24	0.14	- 0.5	-18	.031	0 1 1.2	+ 17.2
Jan. 23, 24, } 26, 27 }	2 58	XCV	D o 5 1.7	16			5.08	5.23	0.15	- 0.5				
" 18, 22	2 55	XCIX	D o 5 38.4	8	84	561	5.07	5.23	0.16	- 0.6	-39	.070	0 0 18.3	+ 5.1
Feb. 14	3 56	XCVII	D o 4 37.8	4			5.10	5.24	0.14	- 0.4				
Jan. 18, 22	3 53	XCIX	D o 5 54.0	8	83	649	5.09	5.23	0.14	- 0.4	9	.014	0 0 38.1	+ 12.1
" 12, 15	2 3	XCVIII	D o 4 54.2	8			5.10	5.23	0.13	- 0.5				
" 22	2 18	XCIX	D o 5 4.8	4	85	522	5.12	5.23	0.11	- 0.4	-38	.073	0 0 5.4	+ 1.4
" 15	1 25	XCVIII	D o 4 8.7	4			5.06	5.23	0.17	- 0.7				
" 6, 7, 9	1 30	C	D o 6 11.5	12	85	527	5.06	5.23	0.17	- 0.7	-46	.087	0 1 1.4	+ 15.9

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st. Stn. in feet
1860	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
Jan. 22	<i>h m</i> 1 47	XCIX	o ' "		+									
" 6,7,9	1 49	C	D o 4 23.4	6	86	533	5.04	5.23	0.19	- 0.7	-51	.096	o o 55.1	+ 14.4
" 14,15	2 38	XCVIII	D o 2 34.1	12										
" 10,11	2 37	CI	D o 5 45.8	8	85	478	5.08	5.23	0.15	- 0.6	-10	.021	o I 35.9	+ 22.5
" 6,7,9	1 16	C	D o 3 52.1	12										
" 10,11	1 30	CI	D o 4 28.9	8	83	497	5.08	5.23	0.15	- 0.6	- 1	.002	o o 18.4	+ 4.5
1859-60														
Jan. 10,11	2 8	CI	D o 4 16.8	16										
D. 29,30,31	1 54	CIII	D o 5 18.7	20	89	543	5.13	5.23	0.10	- 0.4	-16	.029	o o 30.8	+ 8.2
Jan. 1,2														
" 6,7	2 16	C	D o 4 29.4	12										
Dec. 30	2 11	CIII	D o 6 9.1	12	83	562	5.11	5.23	0.12	- 0.4	-38	.068	o o 49.7	+ 13.7
Jan. 1,2														
" 6,7,9	2 36	C	D o 2 30.6	12										
Nov. 17,18,19	2 41	CII	D o 5 3.5	12	83	492	5.08	5.23	0.15	- 0.6	20	.041	o I 16.4	+ 18.5
			D o 5 3.5	12			5.03	5.20	0.17	- 0.7				
Jan. 22	2 4	XCIX	D o 3 24.8	6										
Nov. 18,19	2 3	CII	D o 7 4.4	8	86	592	5.05	5.23	0.18	- 0.6	-18	.030	o I 49.7	+ 31.9
			D o 7 4.4	8			4.94	5.20	0.26	- 0.9				
Jan. 6,7,9	3 13	C	D o 4 30.2	16										
Nov. 21,22,23,24	3 21	CIV	D o 5 55.5	32	83	634	5.07	5.23	0.16	- 0.5	5	.008	o o 42.6	+ 13.2†
									5.00	5.21	0.21	- 0.7		
" 17,18,19	2 27	CII	D o 4 23.5	12										
" 21,22,23,24	2 25	CIV	D o 3 31.4	16	92	484	5.07	5.20	0.13	- 0.6	5	.010	o o 26.1	- 6.2
									5.08	5.21	0.13	- 0.6		
Dec. 30,31	2 33	CIII	D o 5 25.7	12										
Jan. 2									5.08	5.25	0.17	- 0.5	- 6	.009
Nov. 22,24	2 29	CIV	D o 5 30.8	12	91	644	5.01	5.21	0.20	- 0.6				
			D o 5 30.8	12			5.01	5.21	0.20	- 0.6				
D. 29,30,31	3 9	CIII	D o 4 11.3	20										
Jan. 1,2									5.08	5.25	0.17	- 0.6	10	.016
Nov. 28,29	3 9	CV	D o 5 43.6	20										
Dec. 1,2,3									5.01	5.18	0.17	- 0.6		
Nov. 21,22,23,24	1 36	CIV	D o 3 42.2	24										
" 23,29									5.01	5.21	0.20	- 0.8	-27	.056
Dec. 1,2,3	1 34	CV	D o 5 16.8	20	85	483	5.08	5.18	0.10	- 0.4				
" 29,30,31	1 43	CIII	D o 4 20.5	20										
Jan. 1,2									5.10	5.25	0.15	- 0.6	-30	.054
Dec. 26,27	1 46	CVI	D o 5 53.0	16	91	552	5.11	5.23	0.12	- 0.4				
			D o 5 53.0	16			5.11	5.23	0.12	- 0.4				
Nov. 29	3 51	CV	D o 4 56.4	16										
Dec. 1,2,3									5.04	5.18	0.14	- 0.5	21	.033
" 25,26,27	3 44	CVI	D o 5 0.1	16	94	637	5.08	5.23	0.15	- 0.5				
			D o 5 0.1	16			5.08	5.23	0.15	- 0.5				

† Superseded by Spirit Leveled value.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1859	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
	<i>h m</i>		<i>o ' "</i>		<i>+</i>							<i>o ' "</i>		
D. 25,26,27	3 13	CVI	D o 4 58.4	12			5.09	5.23	0.14	- 0.5				
" 12,13, 14,15	3 3	CIX	D o 5 49.9	20	94	609	5.03	5.18	0.15	- 0.5	-19	.031	o o 25.8	+ 7.7
Nov. 28 } Dec. 1,2,3 }	2 16	CV	D o 4 3.1	16			5.06	5.18	0.12	- 0.5				
" 10,12, 13,15	2 17	CIX	D o 5 25.6	20	94	517	5.08	5.18	0.10	- 0.4	-25	.048	o o 41.3	+ 10.5
Nov. 28,29 } Dec. 1,2,3 }	2 36	CV	D o 3 16.9	20			5.10	5.18	0.08	- 0.4				
Nov. 25,26	2 33	CVII	D o 4 0.4	12	94	450	5.02	5.18	0.16	- 0.7	7	.016	o o 21.6	+ 4.8
" 21,22, 23,24 }	1 49	CIV	D o 2 44.9	20			5.03	5.21	0.18	- 0.8				
" 26,27	1 47	CVII	D o 5 1.4	16	85	468	5.08	5.18	0.10	- 0.4	1	.002	o 1 8.5	+ 15.7†
" 28,29 } Dec. 1,2,3 }	1 56	CV	D o 3 52.1	20			5.04	5.18	0.14	- 0.5				
" 5,7	1 49	CVIII	D o 6 26.4	12	94	599	5.08	5.18	0.10	- 0.3	- 9	.015	o 1 17.3	+ 22.7
Nov. 25,26	2 57	CVII	D o 2 38.6	8			5.04	5.18	0.14	- 0.6				
Dec. 5,6,7	2 54	CVIII	D o 5 20.4	12	89	511	5.10	5.18	0.08	- 0.3	16	.031	o 1 21.1	+ 20.3†
" 12,13,14	1 35	CIX	D o 3 38.6	12			5.07	5.18	0.11	- 0.4				
" 6,7	1 37	CVIII	D o 5 22.7	8	96	547	5.04	5.18	0.14	- 0.5	3	.005	o o 52.0	+ 14.0
" 25,26,27	2 57	CVI	E o 1 6.1	12			14.95	5.23	9.72	-47.0				
" 22	2 55	CX	D o 7 24.9	4	94	421	15.51	5.19	10.32	+49.9	-27	.064	o 4 17.0	+ 53.1
" 12,13, 14,15 }	1 14	CIX	D o 1 53.3	16			5.00	5.18	0.18	- 0.6				
" 21,23	1 18	CX	D o 7 15.5	12	96	572	5.08	5.19	0.11	- 0.4	12	.021	o 2 41.2	+ 45.2
" 23	2 2	CX	D o 5 35.6	8			5.03	5.19	0.16	- 0.7				
" 18,19,20	2 6	CXI	D o 2 45.3	20	105	498	5.00	5.17	0.17	- 0.7	- 1	.002	o 1 25.2	- 20.8
" 12,13,14	1 46	CIX	D o 4 21.8	12			4.99	5.18	0.19	- 0.6				
" 17,19,20	1 47	CXI	D o 6 24.8	12	96	636	5.08	5.17	0.09	- 0.3	- 5	.008	o 1 1.7	+ 19.3
" 12,13,14	1 27	CIX	D o 2 26.4	12			5.11	5.18	0.07	- 0.3				
" 8,9	1 26	CXII	D o 6 14.0	8	96	522	5.03	5.23	0.20	- 0.8	1	.002	o 1 53.6	+ 29.1
" 6,7	2 16	CVIII	D o 4 44.1	8			5.08	5.18	0.10	- 0.3				
" 8,9	2 20	CXII	D o 6 15.3	8	93	673	5.06	5.23	0.17	- 0.5	7	.010	o o 45.5	+ 15.0†
Mar. 19,21, 22,23 }	2 2	CXI	D o 3 48.5	24			5.12	4.93	0.19	+ 0.7				
April 4,6,7, 8,9,12 }	2 4	CXII	D o 4 50.4	28	100	548	5.10	4.94	0.16	+ 0.6	14	.026	o o 30.9	+ 8.3

† Superseded by Spirit Levelled values.

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Sta. — 1st Sta. in feet
1859	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instru-ment	Difference					
	<i>h m</i>		<i>° ' "</i>		<i>+</i>							<i>° ' "</i>		
Mar. 19, 21, } 22, 23 }	1 59	CXI	D 0 5 10.6	18			5.04	4.93	0.11	+ 0.4				
" 4, 7, 9	1 59	CXIII	D 0 5 16.6	26	100	603	5.06	4.96	0.10	+ 0.3	-12	.020	0 0 3.0	+ 0.9
April 6, 7, } 8, 10 }	2 29	CXII	D 0 5 44.2	22			5.04	4.94	0.10	+ 0.3				
Mar. 3, 4, 7, 8	2 32	CXIII	D 0 5 5.8	22	102	622	5.13	4.96	0.17	+ 0.6	-14	.023	0 0 19.1	- 5.8
" 19, 21, } 22, 23 }	2 29	CXI	E 0 1 46.9	24			5.08	4.93	0.15	- 0.6				
" 17, 18	2 29	CXIV	D 0 12 17.2	14	100	537	5.06	4.93	0.13	+ 0.5	-47	.088	0 7 2.0	+ 111.3
" 3, 4, 9	1 28	CXIII	E 0 0 15.8	18			5.05	4.96	0.09	- 0.3				
" 17, 18	1 17	CXIV	D 0 11 1.8	16	101	654	5.04	4.93	0.11	+ 0.3	4	.006	0 5 38.8	+ 108.9
" 18	1 52	CXIV	D 0 11 5.2	8			5.04	4.93	0.11	+ 0.4				
" 11, 12, } 14, 15 }	1 45	CXVI	D 0 0 38.0	24	123	615	5.05	4.90	0.15	+ 0.5	-45	.073	0 5 13.6	- 94.7
" 4, 9	4 8	CXIII	D 0 4 27.7	12			5.02	4.96	0.06	+ 0.2				
" 12, 14	4 16	CXVI	D 0 5 50.9	14	101	632	5.03	4.90	0.13	+ 0.4	6	.009	0 0 41.7	+ 12.9
" 3, 4, 7, 9	2 8	CXIII	D 0 3 24.2	24			5.08	4.96	0.12	+ 0.5				
" 1, 2	2 11	CXV	D 0 5 30.9	14	101	510	5.07	4.93	0.14	+ 0.6	-13	.025	0 1 3.4	+ 15.9
April 4, 5, 6, } 8, 10, 14 }	2 16	CXII	D 0 3 39.5	26			5.07	4.94	0.13	+ 0.5				
Mar. 1, 2	2 15	CXV	D 0 4 56.3	14	102	525	5.13	4.93	0.20	+ 0.8	4	.008	0 0 38.6	+ 9.9†
" 3, 4, 7, } 8, 9 }	1 46	CXIII	D 0 2 32.3	26			4.99	4.96	0.03	+ 0.1				
F. 24, 25, 28	1 45	CXVII	D 0 5 24.4	18	101	442	5.07	4.94	0.13	+ 0.6	-18	.041	0 1 26.3	+ 18.7
Mar. 1, 2	1 18	CXV	D 0 4 37.2	14			4.98	4.93	0.05	+ 0.2				
F. 25, 26, 28	1 18	CXVII	D 0 4 44.0	14	99	559	5.03	4.94	0.09	+ 0.3	- 1	.002	0 0 3.5	+ 1.0†
Mar. 12, 14	4 27	CXVI	D 0 5 24.1	10			5.06	4.90	0.16	+ 0.5				
Feb. 25, 28	4 0	CXVII	D 0 5 33.0	12	104	662	5.02	4.94	0.08	+ 0.3	2	.003	0 0 4.4	+ 1.4
Mr. 12, 14, 15	3 9	CXVI	D 0 4 39.7	12			4.98	4.90	0.08	+ 0.3				
Feb. 17, 18	3 7	CXVIII	D 0 5 13.6	12	104	535	5.02	4.95	0.07	+ 0.3	-29	.054	0 0 17.0	+ 4.5
" 24, 25, } 28 }	2 38	CXVII	D 0 5 20.8	22			4.99	4.94	0.05	+ 0.2				
" 16, 17, } 18, 19 }	2 35	CXVIII	D 0 5 54.1	24	98	612	5.04	4.95	0.09	+ 0.3	-32	.052	0 0 16.7	+ 5.0
Mr. 12, 14, 15	2 24	CXVI	D 0 2 8.9	18			5.02	4.90	0.12	+ 0.5				
Feb. 4, 7	2 27	CXIX	D 0 7 16.0	12	104	527	5.01	4.95	0.06	+ 0.2	-19	.036	0 2 33.4	+ 39.7

† Superseded by Spirit Levelled values.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn in feet
1850	Mean of Times of observation						Height in feet				In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference	Angle in seconds				
Feb. 15,16, } 17,18,19 )	<i>h m</i> 2 18	CXVIII	D o 1 40.6	30	+		5.09	4.95	0.14	+ 0.6				
" 4,7	2 23	CXIX	D o 6 17.5	16	106	513	4.98	4.95	0.03	+ 0.1	17	.033	0 2 18.2	+ 34.8
" 4,7	2 9	CXIX	D o 4 43.0	12			5.09	4.95	0.14	+ 0.6				
" 10,11,12	2 10	CXXI	D o 3 32.4	18	113	499	5.01	4.94	0.07	+ 0.3	1	.002	0 0 35.5	- 8.7
" 15,16, } 17,18,19 )	1 50	CXVIII	D o 3 49.3	24			5.09	4.95	0.14	+ 0.5				
" 8,10, } 11,12 )	1 40	CXXI	D o 6 51.3	22	106	588	4.99	4.94	0.05	+ 0.2	-27	.046	0 1 30.9	+ 26.2
" 15,16,19	2 22	CXVIII	D o 3 10.1	18			5.07	4.95	0.12	+ 0.6				
" 22	2 20	CXX	D o 4 2.0	10	106	438	4.98	4.94	0.04	+ 0.2	3	.007	0 0 25.8	+ 5.5
" 24,25,28	1 58	CXVII	D o 3 38.1	18			5.03	4.94	0.09	+ 0.4				
" 22	2 0	CXX	D o 5 11.8	6	98	487	5.06	4.94	0.12	+ 0.5	-22	.045	0 0 46.9	+ 11.2†
" 15,16, } 17,18,19 )	2 50	CXVIII	D o 2 53.2	30			5.08	4.95	0.13	+ 0.5				
Jan. 27,28 } Feb. 1,2 )	2 50	CXXII	D o 6 1.1	20	106	558	4.98	4.94	0.04	+ 0.2	12	.022	0 1 33.8	+ 25.7
" 22,23	1 17	CXX	D o 2 54.6	18			5.08	4.94	0.14	+ 0.6				
Jan. 27,28 } Feb. 1,2 )	1 22	CXXII	D o 5 39.3	24	102	473	5.07	4.94	0.13	+ 0.6	-21	.044	0 1 22.4	+ 19.1†
" 8,10, } 11,12 )	1 43	CXXI	D o 5 25.0	30			5.09	4.94	0.15	+ 0.5				
Jr. 27,28,31 } Feb. 1 )	1 46	CXXII	D o 5 28.9	22	111	647	5.09	4.94	0.15	+ 0.5	- 4	.006	0 0 2.0	+ 0.6
" 8,10, } 11,12 )	2 39	CXXI	D o 4 7.6	24			5.06	4.94	0.12	+ 0.4				
Jan. 18,20,21	2 39	CXXIII	D o 4 32.0	18	111	551	5.08	4.94	0.14	+ 0.5	15	.027	0 0 12.3	+ 3.3
" 27,28 } Feb. 1 )	2 33	CXXII	D o 5 41.6	18			5.04	4.94	0.10	+ 0.3				
Jan. 20,21	2 33	CXXIII	D o 6 9.6	12	105	668	5.03	4.94	0.09	+ 0.3	-22	.033	0 0 14.0	+ 4.6
" 18,20,21	2 5	CXXIII	D o 2 12.3	18			5.07	4.94	0.13	+ 0.6				
" 12,13, } 14,15 )	2 6	CXXIV	D o 5 10.2	24	111	461	5.03	4.94	0.09	+ 0.4	9	.020	0 1 28.9	+ 20.1
" 12,13, } 14,15 )	2 3	CXXIV	D o 6 11.2	28			5.00	4.94	0.06	+ 0.2				
" 5,6,7	2 13	CXXVI	D o 5 11.1	22	115	610	5.07	4.84	0.23	+ 0.8	-37	.061	0 0 29.8	- 8.9
" 20,21	1 23	CXXIII	D o 5 0.5	18			5.00	4.94	0.06	+ 0.2				
" 5,6,7	1 32	CXXVI	D o 5 48.7	18	111	598	5.03	4.84	0.19	+ 0.7	-26	.043	0 0 24.4	+ 7.1
" 20,21	3 26	CXXIII	D o 4 46.0	12			4.98	4.94	0.04	+ 0.1				
" 25,26	3 25	CXXV	D o 4 39.0	14	111	570	5.03	4.95	0.08	+ 0.3	2	.004	0 0 3.4	- 1.0

† Superseded by Spirit Levelled values.

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1859	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Jr. 27, 28, 31 } Feb. 1 }	<i>h m</i> 2 35	CXXII	D ° 4 22.5	26	+									
Jan. 25, 26	2 34	CXXV	D ° 4 43.3	20	105	497	5.10	4.94	0.16	+ 0.7	-25	.050	0 0 10.2	+ 2.5†
1858-59 ,, 20, 21	1 38	CXXIII	D ° 4 36.6	22			5.02	4.94	0.08	+ 0.3	-17	.027	0 0 58.5	+ 18.3
Dec. 24, 25, } 28, 29, 30 }	1 38	CXXVII	D ° 6 33.6	32	111	636	5.04	4.95	0.09	+ 0.3				
Jan. 25, 26	2 10	CXXV	D ° 2 59.7	18			5.00	4.95	0.05	+ 0.2	-26	.054	0 1 26.9	+ 20.5†
Dec. 24, 25, } 28, 30 }	2 19	CXXVII	D ° 5 53.6	30	107	481	4.98	4.95	0.03	+ 0.1				
Jan. 5, 6, 7	3 56	CXXVI	D ° 4 39.6	24			5.03	4.84	0.19	+ 0.5	40	.056	0 0 35.8	+ 12.5
D. 24, 25, 28, } 29, 30, 31 }	3 56	CXXVII	D ° 5 51.5	30	113	711	5.03	4.95	0.08	+ 0.2				
Jan. 5, 6, 7	3 0	CXXVI	D ° 4 17.2	22			5.08	4.84	0.24	+ 0.8	-6	.010	0 0 45.9	+ 13.4
Dec. 18, 21	3 2	CXXVIII	D ° 5 49.4	16	113	596	5.03	4.95	0.08	+ 0.3				
„ 24, 25, 28, } 29, 30, 31 }	3 27	CXXVII	D ° 5 3.0	32			5.08	4.95	0.13	+ 0.4	18	.027	0 0 6.3	+ 2.0
„ 17, 18, } 20, 21 }	3 22	CXXVIII	D ° 5 15.6	28	111	656	5.03	4.95	0.08	+ 0.3				
Jan. 6, 7	2 10	CXXVI	D ° 3 43.7	14			5.06	4.84	0.22	+ 0.9	-55	.105	0 1 32.5	+ 23.8
„ 8, 10	2 15	CXXIX	D ° 6 49.1	18	113	524	5.04	4.94	0.10	+ 0.4				
Nov. 15, 16 } D. 17, 18, 21 }	2 6	CXXVIII	D ° 3 20.6	28			5.04	4.95	0.09	+ 0.4	-1	.002	0 0 44.0	+ 10.6
N. 18, 19, 20 } Jan. 8, 10 }	2 2	CXXIX	D ° 4 48.4	34	116	489	5.08	4.94	0.14	+ 0.6				
N. 18, 19, 20	3 38	CXXIX	D ° 3 46.1	22			5.06	4.94	0.12	+ 0.5	-21	.042	0 0 44.9	+ 11.1
„ 22, 23, } 24, 25 }	3 45	CXXXI	D ° 5 16.0	24	118	501	5.03	4.95	0.08	+ 0.3				
1858 „ 15, 16	1 56	CXXVIII	D ° 3 28.6	18			5.07	4.95	0.12	+ 0.4	6	.010	0 1 16.5	+ 21.8
„ 22, 23, 24, } 25, 26 }	1 57	CXXXI	D ° 6 1.4	40	116	582	5.08	4.95	0.13	+ 0.5				
Dec. 17, 18, 21	1 57	CXXVIII	D ° 3 32.5	28			5.02	4.95	0.07	+ 0.3	-5	.010	0 0 42.5	+ 10.5
„ 13, 14, 15	1 59	CXXX	D ° 4 57.3	18	116	501	5.08	4.96	0.12	+ 0.5				
„ 24, 25, } 28, 29, 30 }	1 24	CXXVII	D ° 2 57.0	42			5.02	4.95	0.07	+ 0.3	-24	.056	0 0 59.4	+ 12.4†
„ 13, 14, 15	1 30	CXXX	D ° 4 55.8	20	111	426	5.01	4.96	0.05	+ 0.2				
„ 17, 18, 21	1 24	CXXVIII	D ° 1 59.9	18			5.08	4.95	0.13	+ 0.5	10	.018	0 2 34.8	+ 43.4
Nov. 8, 9, 10, } „ 11, 12 }	1 22	CXXXII	D ° 7 9.6	30	116	571	5.06	4.95	0.11	+ 0.4				
Dec. 14, 15	3 51	CXXX	D ° 2 48.2	30			5.04	4.96	0.08	+ 0.3	26	.043	0 1 50.6	+ 33.2†
Nov. 8, 9, 10	4 32	CXXXII	D ° 6 29.4	12	115	611	5.04	4.95	0.09	+ 0.3				

† Superseded by Spirit Leveled values.



Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. - 1st Stn. in feet
1858	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
	<i>h m</i>		<i>° ' "</i>		<i>+</i>							<i>° ' "</i>		
Nov. 23, 24, 26	2 1	CXXXI	D 0 3 55.8	18			5.07	4.95	0.12	+ 0.4				
" 9, 10, 11, 12	1 58	CXXXII	D 0 6 16.3	22	120	659	5.07	4.95	0.12	+ 0.4	23	.035	0 1 10.3	+ 22.7
" 22, 23, 24, } 25, 26 }	1 10	CXXXI	D 0 2 14.4	26			5.07	4.95	0.12	+ 0.5				
" 27, 29, 30 } Dec. 1, 2 }	1 15	CXXXIII	D 0 4 32.4	28	120	468	5.04	4.95	0.09	+ 0.4	30	.064	0 1 9.0	+ 15.8
Nov. 8, 9, 10, } 11, 12 }	2 24	CXXXII	D 0 6 30.3	30			5.10	4.95	0.15	+ 0.4				
" 30 } Dec. 2 }	2 28	CXXXIII	D 0 5 59.8	14	120	766	5.04	4.95	0.09	+ 0.2	8	.010	0 0 15.4	- 5.8
N. 22, 23, 24, } 25, 26 }	2 57	CXXXI	D 0 4 33.4	36			5.04	4.95	0.09	+ 0.2				
" 3, 4, 5	3 4	CXXXIV	D 0 8 5.4	16	120	813	5.06	4.95	0.11	+ 0.3	27	.033	0 1 46.1	+ 42.3
" 8, 9, 10	2 4	CXXXII	D 0 2 7.2	14			5.04	4.95	0.09	+ 0.4				
" 3, 4, 5	1 56	CXXXIV	D 0 5 5.7	18	120	458	5.14	4.95	0.19	+ 0.8	12	.026	0 1 29.5	+ 20.1†
" 27, 29, 30 } Dec. 1, 2 }	2 14	CXXXIII	D 0 3 10.7	36			5.04	4.95	0.09	+ 0.3				
Nov. 3, 4, 5	2 16	CXXXIV	D 0 6 10.2	16	124	621	5.08	4.95	0.13	+ 0.4	30	.048	0 1 29.8	+ 27.4
" 27, 29, 30 } Dec. 1, 2 }	1 48	CXXXIII	D 0 4 18.2	28			5.05	4.95	0.10	+ 0.4				
" 3, 6, 7	1 52	CXXXV	D 0 4 41.1	20	124	522	5.09	4.94	0.15	+ 0.6	- 9	.017	0 0 11.6	+ 3.0
Nov. 3, 4, 5	2 40	CXXXIV	D 0 6 51.2	16			5.00	4.95	0.05	+ 0.1				
Dec. 6, 7	2 40	CXXXV	D 0 4 52.9	16	126	773	5.04	4.94	0.10	+ 0.3	34	.044	0 0 59.1	- 22.4
Nov. 29, 30 } Dec. 1, 2 }	2 55	CXXXIII	D 0 3 10.3	24			5.01	4.95	0.06	+ 0.2				
Nov. 1, 2	2 55	CXXXVI	D 0 7 47.4	12	124	737	5.07	4.97	0.10	+ 0.3	39	.053	0 2 18.6	+ 50.2
" 3, 4, 5	2 15	CXXXIV	D 0 2 1.0	16			5.10	4.95	0.15	+ 0.7				
Oct. 30 } Nov. 1, 2 }	2 22	CXXXVI	D 0 5 31.4	16	126	464	5.03	4.97	0.06	+ 0.3	5	.011	0 1 45.0	+ 23.9†
1857 Mar. 27, 28, } 30, 31 }	2 13	CXXXV	D 0 1 5.4	24			5.05	4.95	0.10	+ 0.4				
April 2, 3, 14	2 10	CXXXVI	D 0 7 3.0	16	125	528	5.01	4.97	0.04	+ 0.2	20	.038	0 2 58.7	+ 46.3
Mar. 27, 28, } 30, 31 }	2 54	CXXXV	D 0 3 18.9	30			5.00	4.95	0.05	+ 0.1				
Ap. 17, 20, } 21, 22, 23 }	2 53	CXXXVII	D 0 8 12.4	32	125	719	5.10	4.94	0.16	+ 0.5	14	.019	0 2 27.0	+ 51.9
" 3, 13, 14,	1 38	CXXXVI	D 0 3 44.7	16			5.00	4.97	0.03	+ 0.1				
" 21, 22, 23	1 50	CXXXVII	D 0 4 40.2	14	129	512	5.07	4.94	0.13	+ 0.5	3	.006	0 0 28.0	+ 7.0†
Mar. 28, 30, 31	1 41	CXXXV	E 1 25 12.5	18			5.22	4.95	0.27	- 0.4				
Jan. 7, 8, 9	1 42	CXXXVIII	D 1 45 33.4	18	125	1394	2.21	5.10	2.89	- 4.2	88	.063	1 35 20.7	+ 3916.8

† Superseded by Spirit Leveled values.

PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st. Stn. in feet
1857	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Ap. 17,20, } 21,22,23 }	2 18	CXXXVII	E I 14 44'7	30			5'22	4'94	0'28	- 0'4				
Jan. 7,8,9	2 6	CXXXVIII	D I 36 51'0	18	131	1529	2'50	5'10	2'60	- 3'5	103	067	I 25 45'9	+3865'1
„ 7,8,9	2 37	CXXXVIII	D 0 45 12'6	16			5'16	5'10	0'06	+ 0'1				
Mar. 2,4, } 5,6 }	2 40	CXLI	E 0 24 11'8	16	939	1448	5'24	4'97	0'27	- 0'4	93	064	0 34 42'1	-1480'2
Ap. 20,21, } 22,23 }	3 15	CXXXVII	E 0 42 56'4	24			5'10	4'94	0'16	- 0'2				
Mar. 2,3,4, } 5,6 }	3 11	CXLI	D I 4 42'1	30	131	1499	16'16	4'97	11'19	+15'2	89	059	0 53 56'8	+2382'6
Ap. 17,18, } 20,21,23 }	2 2	CXXXVII	D 0 5 7'0	28			5'07	4'94	0'13	+ 0'5				
Mar. 20 } April 16 }	2 28	CXXXIX	D 0 4 25'4	18	131	558	5'01	4'97	0'04	+ 0'1	- 8	014	0 0 21'0	- 5'8†
„ 3,4,13, } 14 }	3 3	CXXXVI	D 0 3 50'4	28			5'04	4'97	0'07	+ 0'3				
Mar. 20,21 } April 15,16 }	3 1	CXXXIX	D 0 5 2'1	28	129	552	5'08	4'97	0'11	+ 0'4	9	016	0 0 35'9	+ 9'7†
Mar. 21 } April 15,16 }	3 16	CXXXIX	D 0 4 14'4	20			5'00	4'97	0'03	+ 0'1				
Mar. 12,13, } 17,18,19 }	3 25	CXL	D 0 5 57'5	26	136	625	5'03	5'00	0'03	+ 0'1	6	010	0 0 51'6	+ 15'8†
Mar. 2,3, } 4,5 }	1 52	CXLI	D I 6 14'4	24			5'02	4'97	0'05	+ 0'1				
April 7,8	1 56	CXL	E 0 45 8'6	20	631	1439	5'10	4'95	0'15	- 0'2	86	060	0 55 41'5	-2361'9
Jan. 8,9, } 10 }	2 21	CXXXVIII	D 0 19 55'6	16			5'08	5'10	0'02	- 0'0				
„ 21,22, } 27,28 }	2 12	CXLII	D 0 12 1'8	20	939	2233	5'24	5'01	0'23	+ 0'2	158	071	0 3 56'8	- 259'7
Mar. 2,3,4, } 5,6 }	2 26	CXLI	E 0 15 3'0	24			5'04	4'97	0'07	- 0'1				
Jr. 20,21,22, } 27,28 }	2 26	CXLII	D 0 37 31'3	32	631	1573	5'16	5'01	0'15	+ 0'2	112	071	0 26 17'2	+1218'7
„ 21,22,23, } 27,28 }	1 38	CXLII	D I 5 40'0	28			5'07	5'01	0'06	+ 0'1				
Feb. 7,8,10	1 58	CXLIII	E 0 43 2'9	24	885	1608	5'04	5'02	0'02	- 0'0	125	078	0 54 21'5	-2576'8
Mar. 2,4, } 5,6 }	2 25	CXLI	D 0 36 45'2	16			5'05	4'97	0'08	+ 0'1				
Feb. 7,8,10	2 21	CXLIII	E 0 5 3'1	14	631	2208	5'10	5'02	0'08	- 0'1	153	069	0 20 54'2	-1359'9
Mar. 2,4, } 5,6 }	2 39	CXLI	E 0 16 20'1	18			5'15	4'97	0'18	- 0'2				
Feb. 17,18,19	2 32	CXLIV	D 0 46 31'6	18	631	2113	5'16	5'02	0'14	+ 0'1	151	071	0 31 25'8	+1957'2
April 8,9	3 6	CXL	E 0 43 29'8	8			5'15	4'95	0'20	- 0'2				
Feb. 17,18,19	3 4	CXLIV	D I 18 32'1	18	139	2398	5'03	5'02	0'01	+ 0'0	148	062	I 1 0'9	+4312'2*
(1)	2 43	CXLIII	E 0 56 20'1	26			3'28	5'16	1'88	+ 2'3				
(2)	2 54	CXLIV	D I 19 58'0	26	350	1649	3'19	5'18	1'99	- 2'5	118	072	I 8 9'0	+3312'4

† Superseded by Spirit Leveled values. \* Rejected. (1) Mean of observations taken on 10 March 1852 and 7, 8, 10 February 1857. (2) Mean of observations taken on 24 March 1852 and 17, 18, 19 February 1857.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log. distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn. — 1st Stn. in feet
1853	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Mar. 10	h 3 m 6	CXLIII	0 17 14.7	4	+		1'35	5'30	3'95	- 6.0		0 0 0		
" 14,15	3 7	CXLV	0 2 18.9	8	35°	1340	1'30	5'33	4'03	- 6.1	89	.066	0 7 28.0	- 294.9
" 24	3 3	CXLIV	D 1 30 10.2	8			1'35	5'34	3'99	- 5.2				
" 14,15	3 7	CXLV	E 1 7 15.1	16	1038	1555	1'40	5'33	3'93	+ 5.2	95	.061	1 18 42.7	- 3608.0
" 10	2 52	CXLIII	D 0 8 12.9	12			1'33	5'30	3'97	- 5.5				
" 5,6	3 48	CXLVI	D 0 13 1.7	8	35°	1458	1'30	5'33	4'03	- 5.6	97	.067	0 2 24.4	+ 103.4
" 14,15	2 44	CXLV	E 0 2 35.1	8			1'33	5'33	4'00	+ 6.8				
" 5,6	3 24	CXLVI	D 0 20 8.2	8	288	1194	1'35	5'33	3'98	- 6.8	77	.064	0 11 21.7	+ 399.8
" 5,6	3 45	CXLVI	D 0 18 57.5	8			1'35	5'33	3'98	- 7.9				
Feb. 29 } Mar. 1,2 }	3 45	CXLVIII	E 0 3 57.1	12	371	1029	1'40	5'30	3'90	+ 7.7	72	.070	0 11 27.2	- 347.4
" 14,15	2 40	CXLV	D 0 4 53.5	8			1'35	5'33	3'98	- 8.9				
Feb. 29 } Mar. 1,2 }	3 23	CXLVIII	D 0 8 48.7	12	288	914	1'35	5'30	3'95	- 8.8	55	.060	0 1 57.7	+ 52.8†
" 14,15	3 12	CXLV	E 0 15 59.8	16			1'27	5'33	4'06	+ 8.4				
" 18	3 13	CXLVII	D 0 31 15.2	8	288	990	1'35	5'28	3'93	- 8.1	46	.046	0 23 37.7	+ 689.4
" 24	3 0	CXLIV	D 1 12 20.7	8			1'27	5'34	4'07	- 5.1				
" 18	3 3	CXLVII	E 0 48 24.4	8	1038	1640	1'40	5'28	3'88	+ 4.8	107	.065	1 0 22.4	- 2918.6
Feb. 29 } Mar. 1,2 }	3 58	CXLVIII	E 0 6 44.0	12			1'27	5'30	4'03	+ 6.2				
" 18	3 26	CXLVII	D 0 26 6.8	4	299	1321	1'35	5'28	3'93	- 6.1	85	.064	0 16 25.5	+ 639.5
" 5,6	3 9	CXLVI	D 0 5 38.2	12			1'33	5'33	4'00	- 4.6				
Feb. 10	3 2	(XVII)	D 0 20 4.6	8	371	1777	1'40	5'33	3'93	- 4.5	122	.069	0 7 13.3	+ 378.1
Mar. 1,2	3 37	CXLVIII	E 0 0 50.9	8			1'33	5'30	3'97	+ 4.6				
Feb. 8,10	3 40	(XVII)	D 0 26 46.8	8	299	1776	1'30	5'33	4'03	- 4.6	115	.065	0 13 48.9	+ 722.9
Mar. 1,2	3 13	CXLVIII	D 0 2 1.6	8			1'35	5'30	3'95	- 6.2				
Feb. 25	3 12	CXLIX	D 0 17 1.4	4	299	1300	1'30	5'35	4'05	- 6.3	85	.065	0 7 29.9	+ 287.1
Mar. 18	2 22	CXLVII	D 0 18 57.5	8			1'35	5'28	3'93	- 7.5				
Feb. 25,26	3 8	CXLIX	E 0 3 4.7	8	432	1072	1'27	5'35	4'08	+ 7.8	67	.063	0 11 1.3	- 348.1
" 29 } Mar. 1,2 }	3 6	CXLVIII	E 0 8 24.1	12			1'35	5'30	3'95	+ 6.1				
Feb. 16,17	3 8	(XIX)	D 0 27 45.3	8	299	1322	1'30	5'28	3'98	- 6.1	87	.066	0 18 4.7	+ 704.4

NOTE.—(XVII) and (XIX) appertain to base-line figures. † Superseded by Spirit Levelled value.

## PRINCIPAL TRIANGULATION—DIFFERENCES OF HEIGHT.

Astronomical Date		Station	Observed Vertical Angle	Number of observations	Correction to Log distance in 7th place	Contained Arc in seconds	Object and Eye Correction				Terrestrial Refraction		Subtended Angle	Height of 2nd Stn.—1st Stn. in feet
1852	Mean of Times of observation						Height in feet			Angle in seconds	In seconds	Decimals of Contained Arc		
							Signal	Instrument	Difference					
Feb. 25	<i>h m</i> 3 2	CXLIX	0 0 25.4	4	+		1'35	5'35	4'00	- 5.7		0 0 0		
„ 16,17	3 3	(XIX)	0 20 6.6	8	359	1419	1'35	5'28	3'93	- 5.6	99	070	0 9 50.7	+ 411.6
„ 9,10	2 46	(XVII)	0 10 15.4	12			1'35	5'33	3'98	- 6.0				
Jan. 10	2 49	(XIX)	0 9 16.8	4	449	1348	1'33	5'28	3'95	- 6.0	94	070	0 0 29.3	- 19.4
Feb. 9,10	3 15	(XVII)	0 0 38.7	8			1'35	5'33	3'98	+ 8.2				
Jan. 17,18,19	3 0	(XV)	0 15 0.1	12	449	987	1'33	5'30	3'97	- 8.2	71	072	0 7 49.4	+ 227.7
„ 10,11	2 55	(XIX)	0 4 7.5	8			1'28	5'28	4'00	- 5.8				
„ 18,19	2 55	(XV)	0 16 11.0	8	445	1401	1'35	5'30	3'95	- 5.7	97	069	0 6 1.8	+ 248.9
Feb. 8,10	3 22	(XVII)	0 51 48.6	8			1'27	5'33	4'06	- 9.6				
„ 1,2	3 22	(XIII)	0 38 37.8	8	449	858	1'33	5'25	3'92	+ 9.3	43	050	0 45 13.1	- 1143.6
Jan. 18,19	3 4	(XV)	0 1 7 26.2	8			1'40	5'30	3'90	- 10.5				
Feb. 1,2	3 6	(XIII)	0 56 12.7	8	497	754	1'35	5'25	3'90	+ 10.5	51	068	1 1 49.5	- 1374.6
1851-52														
Jan. 17,18,19	2 37	(XV)	0 40 4.6	12			1'27	5'30	4'03	+ 7.5				
Dec. 18,20, } 21,22 }	2 36	(XVIII)	0 55 46.5	16	497	1099	1'28	5'28	4'00	- 7.4	86	078	0 47 55.6	+ 1552.9
Jan. 10,11	3 2	(XIX)	0 26 10.3	8			1'27	5'28	4'01	+ 5.0				
Dec. 14,22	3 6	(XVIII)	0 48 56.0	8	445	1621	1'35	5'28	3'93	- 4.9	133	082	0 37 33.2	+ 1794.1
Jan. 17,18,19	2 58	(XV)	0 1 30 23.1	16			1'35	5'30	3'95	+ 11.3				
„ 23	2 59	(XVI)	0 1 40 42.4	8	497	715	1'35	5'38	4'03	- 11.5	59	083	1 35 32.7	+ 2013.1
Dec. 14,16	3 9	(XVIII)	0 7 24.7	8			1'35	5'28	3'93	+ 7.7				
Jan. 23	2 52	(XVI)	0 22 34.3	8	819	1043	1'27	5'38	4'11	- 8.0	75	072	0 14 59.4	+ 461.0
1852														
„ 18,19	3 9	(XV)	0 1 10 19.9	8			1'28	5'30	4'02	- 11.7				
„ 30,31	3 14	(XIV)	0 59 54.4	8	497	698.	1'35	5'25	3'90	+ 11.4	48	069	1 5 7.0	- 1338.9
„ 23	2 52	(XVI)	0 2 50 25.2	4			1'28	5'38	4'10	- 12.2				
„ 30,31	2 50	(XIV)	0 2 40 29.7	8	915	687	1'35	5'25	3'90	+ 11.6	58	084	2 45 27.2	- 3352.2
Feb. 1	3 17	(XIII)	0 0 1 1.4	4			6'00	5'25	0'75	+ 3.7				
Jan. 30,31	3 15	(XIV)	0 0 6 47.2	8	212	408	6'00	5'25	0'75	+ 3.7	-34	083	0 2 52.9	+ 34.7

NOTE.—(XIII) to (XIX) appertain to base-line figures.

J. B. N. HENNESSEY.

## PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.

## GREAT INDUS SERIES.

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	<b>S</b> Solid <b>P</b> Perforated <b>H</b> Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	<b>S</b> Solid <b>P</b> Perforated <b>H</b> Hollow
Manora Point	9'30	...	0	<b>S</b>	VI . . .	...	2203	3	<b>S</b>
Karachi Obsy.	35'44	...	0	<b>S</b>	VII . . .	...	4042	3	<b>S</b>
(XX) . . .	46'38	...	23	<b>P</b>	VIII. . .	...	3662	3	<b>S</b>
(XXI) . . .	204'40	...	18	<b>P</b>	IX . . .	...	3473	3	<b>S</b>
Mutrani H. S.	...	253	5	<b>S</b>	X . . .	...	2790	4	<b>S</b>
A : H. S.	...	418	3	<b>S</b>	XI . . .	...	1509	3	<b>S</b>
(XXII) . . .	...	585	3	<b>S</b>	XII . . .	183'95	...	31	<b>S</b>
(XXIII) . . .	...	491	3	<b>S</b>	XIII. . .	...	1900	3	<b>S</b>
(XXIV) . . .	...	780	3	<b>S</b>	XIV. . .	202'92	...	29	<b>P</b>
(XXV) . . .	...	1091	3	<b>S</b>	XV ; . . .	...	1191	2	<b>S</b>
I . . .	...	1552	3	<b>S</b>	XVI . . .	219'16	...	10	<b>S</b>
II . . .	...	2675	3	<b>S</b>	XVII . . .	...	547	3	<b>S</b>
III . . .	...	1570	3	<b>S</b>	XVIII . . .	158'40	...	15	<b>S</b>
IV . . .	...	1560	3	<b>S</b>	XIX. . .	...	723	3	<b>S</b>
V . . .	...	3271	3	<b>S</b>	XX . . .	174'18	...	21	<b>S</b>

NOTE.—(XX) to (XXV) appertain to base-line figures. \* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally.

## PRINCIPAL TRIANGULATION—HEIGHTS ABOVE MEAN SEA LEVEL.

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow
XXI.	183'21	...	18	S	LI . . .	...	256	31	P
XXII . . .	...	647	8	S	LII . . .	...	258	31	P
XXIII . . .	...	159	25	P	LIII . . .	...	264	30	P
XXIV . . .	173'49	...	25	S	LIV . . .	...	273	30	P
XXV . . .	...	172	31	P	LV . . .	...	266	30	P
XXVI . . .	154'18	...	31	P	LVI . . .	...	272	27	P
XXVII . . .	...	187	20	S	LVII . . .	...	267	30	P
XXVIII . . .	...	184	21	P	LVIII . . .	245'56	...	29	P
XXIX . . .	155'32	...	30	P	LIX . . .	...	273	25	P
XXX . . .	...	220	4	S	LX . . .	...	291	30	P
XXXI . . .	...	204	40	P	LXI . . .	...	397	5	S
XXXII . . .	165'74	...	40	P	LXII . . .	...	282	22	P
XXXIII . . .	...	199	30	P	LXIII . . .	...	300	28	P
XXXIV . . .	...	205	30	P	LXIV . . .	...	296	30	P
XXXV . . .	...	205	31	P	LXV . . .	...	299	29	P
XXXVI . . .	215'29	...	9	S	LXVI . . .	...	305	30	P
XXXVII . . .	...	221	35	S	LXVII . . .	...	304	27	P
XXXVIII . . .	225'63	...	36	S	LXVIII . . .	...	304	27	P
XXXIX . . .	...	205	25	P	LXIX . . .	...	309	25	P
XL . . .	...	235	28	S	LXX . . .	...	309	22	P
XLI . . .	...	213	25	P	LXXI . . .	...	323	31	P
XLII . . .	234'75	...	19	S	LXXII . . .	...	342	23	P
XLIII . . .	...	228	27	P	LXXIII . . .	288'42	...	31	P
XLIV . . .	...	234	21	P	LXXIV . . .	...	332	30	P
XLV . . .	203'48	...	25	P	LXXV . . .	295'08	...	35	P
XLVI . . .	...	236	25	P	LXXVI . . .	...	346	34	P
XLVII . . .	213'32	...	30	P	LXXVII . . .	...	340	26	P
XLVIII . . .	...	240	25	P	LXXVIII . . .	...	337	28	P
XLIX . . .	231'25	...	36	P	LXXIX . . .	...	350	32	P
L . . .	...	250	30	P	LXXX . . .	...	345	32	P

\* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally.

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow
LXXXI . . .	290'29	...	30	P	CXI . . .	...	481	26	P
LXXXII . . .	...	309	26	P	CXII . . .	489'83	...	48	S†
LXXXIII . . .	300'55	....	25	P	CXIII . . .	...	484	19	P
LXXXIV . . .	296'30	...	31	P	CXIV . . .	...	593	21	P
LXXXV . . .	...	349	28	P	CXV . . .	474'40	...	26	P
LXXXVI . . .	...	380	26	P	CXVI . . .	...	500	24	P
LXXXVII . . .	...	349	30	P	CXVII . . .	471'41	...	30	P
LXXXVIII . . .	...	368	25	P	CXVIII . . .	...	507	23	P
LXXXIX . . .	...	359	25	P	CXIX . . .	...	541	5	S
XC . . .	...	364	25	P	CXX . . .	490'56	...	22	P
XCI . . .	...	412	33	S†	CXXI . . .	...	532	28	P
XCII . . .	...	364	25	P	CXXII . . .	504'46	...	28	P
XCIII . . .	...	399	16	P	CXXIII . . .	...	536	30	P
XCIV . . .	...	380	27	P	CXXIV . . .	...	554	14	P
XCV . . .	...	405	32	P	CXXV . . .	512'88	...	20	P
XCVI . . .	...	405	30	P	CXXVI . . .	...	543	25	P
XCVII . . .	...	398	31	P	CXXVII . . .	531'77	...	22	P
XCVIII . . .	...	409	30	P	CXXVIII . . .	...	557	21	P
XCIX . . .	...	411	24	P	CXXIX . . .	...	567	22	P
C . . .	396'68	...	29	P	CXXX . . .	550'55	...	16	P
CI . . .	...	430	29	P	CXXXI . . .	...	579	21	P
CII . . .	...	444	21	P	CXXXII . . .	578'87	...	23	P
CIII . . .	...	438	30	P	CXXXIII . . .	...	595	24	P
CIV . . .	409'63	...	27	P	CXXXIV . . .	605'67	...	16	P
CV . . .	...	450	26	P	CXXXV . . .	...	599	26	P
CVI . . .	...	451	28	P	CXXXVI . . .	618'96	...	27	P
CVII . . .	428'67	...	26	P	CXXXVII . . .	629'65	...	21	P
CVIII . . .	449'03	...	25	P	CXXXVIII . . .	...	4516	3	S
CIX . . .	...	460	29	P	CXXXIX . . .	626'62	...	28	P
CX . . .	...	504	15	P	CXL . . .	636'65	...	32	P

\* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally. † Station on bund of a tank. ‡ Station on bastion of a fort.

## PRINCIPAL TRIANGULATION—HEIGHTS ABOVE MEAN SEA LEVEL.

Station	Height in feet above Mean Sea Level, determined		Pillar or Tower		Station	Height in feet above Mean Sea Level, determined		Pillar or Tower	
	by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow		by Spirit Levelling	Trigonometrically	*Height in feet	S Solid P Perforated H Hollow
CXLI . . .	...	3036	2	S	(XIX) . . .	...	2142	2	S
CXLII . . .	...	4257	1	S	(XVIII) . . .	...	3939	2	S
CXLIII . . .	...	1683	2	S	(XVII) . . .	...	2161	4	S
CXLIV . . .	...	4994	2	S	(XVI) . . .	...	4401	2	S
CXLV . . .	1384·85	...	2	S	(XV) . . .	...	2389	3	S
CXLVI . . .	...	1786	2	S	(XIII) . . .	1014·61 <sub>(1)</sub>	...	4·5	S
CXLVII . . .	...	2076	2	S			1018·15 <sub>(2)</sub>	...	—
CXLVIII . . .	1439·03	...	2	S	(XIV) . . .	...	1049†	5	S
CXLIX . . .	...	1728	2	S					

The preceding spirit levelled heights refer in all cases to the surfaces on which the levelling staff actually stood; these surfaces are exactly indicated in the descriptions given on the following pages. The heights determined trigonometrically always refer to the upper mark-stone, or to the upper surface of the pillar on which the theodolite stood.

NOTE.—(XIII) to (XIX) appertain to base-line figures. \* When the pillar is perforated, the height given here is between upper surface of pillar and mark on ground level in floor of passage, otherwise the height is that of the building above the surface of ground generally. † The mark here referred to is the base-line dot; it is protected by a hemispherical dome of masonry on the keystone of which a mark for ordinary reference will be found; the height of this mark is 3·41 feet above the base-line dot.



DESCRIPTIONS.

When determining the spirit levelled heights, given on pages 97—<sub>d</sub> to 100—<sub>d</sub>, the levelling staff stood on the surfaces hereafter described.

*Manora Point* ; on the letters  $\frac{C.T.S.}{B.M.}$  engraved on the upper surface of the pillar.

*Karáchi Observatory* ; on the floor of East room, the mark-stone let into the upper surface of the pillar is .027 of a foot above this floor.

(XX) or *Karáchi base-line, South End Station* ; on the upper surface of the stone let into the ground floor of the tower ; this surface carries the dot on silver used in the measurement of the base-line.

(XXI) or *Karáchi base-line, North End Station* ; on the upper surface of the stone let into the ground floor of the tower ; this surface carries the dot on silver used in the measurement of the base-line.

XII or *Mír Khán Tower Station* ; on the mark-stone let into the upper surface of the pillar.

XIV or *Hairo Tower Station* ; on the mark-stone let into the ground floor of the tower.

XVI or *Mír-ká-kúba Tower Station* ; on the mark-stone let into the upper surface of the pillar.

XVIII or *Sabar Khán Tower Station* ;

XX or *Máru Pír Tower Station* ;

XXI or *Károhar Tower Station* ;

XXIV or *Sojra Tower Station* ;

XXVI or *Lakhá Tower Station* ;

XXIX or *Chándiá-Khán Tower Station* ;

XXXII or *Jalbáni Tower Station* ;

XXXVI or *Yúsuf Platform Station* ;

XXXVIII or *Mári Tower Station* ;

XLII or *Háttdará Tower Station* ;

XLV or *Jangal-pahora Tower Station* ;

XLVII or *Litan Tower Station* ;

XLIX or *Kandkot Tower Station* ;

LVIII or *Kasmor Tower Station* ;

LXXIII or *Sháhpúr Tower Station* ;

LXXV or *Golá Tower Station* ;

} On the mark-stone let into the upper surface of the pillar.

} On the mark-stone let into the ground floor of the tower.

} On the mark-stone let into the upper surface of the pillar.

} On the mark-stone let into the ground floor of the tower.

## DESCRIPTIONS.—(Continued).

LXXXI or *Lanjiwár Tower Station* ;LXXXIII or *Chuharlár Tower Station* ;LXXXIV or *Lálúwáli Tower Station* ;C or *Doratá Tower Station* ;CIV or *Khemwála Tower Station* ;CVII or *Máhtwála Tower Station* ;CVIII or *Abbáswála Tower Station* ;

On the mark-stone let into the ground floor of the tower.

CXII or *Derá Dín Panáh Platform Station* ; on the mark-stone let into the upper surface of the pillar.CXV or *Sakwála Tower Station* ;CXVII or *Farowála Tower Station* ;CXX or *Sukhtwála Tower Station* ;CXXII or *Sháhpúr Tower Station* ;CXXV or *Mohammad Sháh Tower Station* ;CXXVII or *Jharkil Tower Station* ;CXXX or *Kasain Tower Station* ;CXXXII or *Bakar Tower Station* ;CXXXIV or *Segrá Tower Station* ;CXXXVI or *Ahmad Sindí Tower Station* ;CXXXVII or *Sándí Tower Station* ;CXXXIX or *Miáni Tower Station* ;CXL or *Heto Tower Station* ;

On the mark-stone let into the ground floor of the tower.

CXLV or *Taman Station* ;CXLVIII or *Pari Hill Station* ;

On the mark-stone let into the upper surface of the pillar.

(XIII) or *Chach base-line, South-West End Station* ; the dot used in the measurement of the base-line is protected by a masonry dome about 3½ feet high. This dome was removed in the first instance and the levelling staff placed on the base-line dot ; the height of this point, above mean sea level, will be found on page 100<sub>d</sub>, denoted by the subscript (1). The dome was then restored, and the staff placed on the mark cut on the key-stone ; the height of this point, above mean sea level, will be found on the same page denoted by the subscript (2).

For further particulars of these stations, see pages (5) to (7) and 6—*D*, to 23—*D*.

PRINCIPAL TRIANGULATION. AZIMUTHAL OBSERVATIONS.

GREAT INDUS SERIES.

Observations at Karáchi Observatory,

Lat. N.  $24^{\circ} 49' 50'' \cdot 25$ , Long. E.  $67^{\circ} 4' 2'' \cdot 31 = 4 \ 28 \ 16 \cdot 2 = 0 \cdot 186$ , Height above mean sea level 35 feet,

observed by Lieutenant J. F. Tennant

with Troughton & Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R.M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1855						<i>h m s</i>	<i>' "</i>	<i>° ' "</i>		<i>"</i>	
8th October	$\alpha$ Ursee Minoris (opp.) (N. A.)	East	R. 0 I	- I 36 25 <sup>o</sup> 86	Level readings insufficient	0 12 34 <sup>o</sup> 0	- 0 8'70	- I 36 34 <sup>o</sup> 56	$\pi + 1^{\circ} 36' 31'' \cdot 06$	56 <sup>o</sup> 50	L. 179° 59' 56"·57 R. 179 59 57·71
				27 <sup>o</sup> 56		9 29 <sup>o</sup> 0	4'96	32 <sup>o</sup> 52		58 <sup>o</sup> 54	
			L. 180 I	35 <sup>o</sup> 58		2 27 <sup>o</sup> 0	0'33	35 <sup>o</sup> 91		55 <sup>o</sup> 15	
				34 <sup>o</sup> 82		0 42 <sup>o</sup> 0	0'03	34 <sup>o</sup> 85		56 <sup>o</sup> 21	
				33 <sup>o</sup> 14		5 19 <sup>o</sup> 0	1'56	34 <sup>o</sup> 70		56 <sup>o</sup> 36	
			28 <sup>o</sup> 88	8 7 <sup>o</sup> 0		3'63	32 <sup>o</sup> 51	58 <sup>o</sup> 55			
		R. 0 I	23 <sup>o</sup> 20	13 29 <sup>o</sup> 0		10'02	33 <sup>o</sup> 22	57 <sup>o</sup> 84			
			18 <sup>o</sup> 82	16 6 <sup>o</sup> 0		14'29	33 <sup>o</sup> 11	57 <sup>o</sup> 95			
		West	R. 0 I	+ I 36 21 <sup>o</sup> 02		0 13 26 <sup>o</sup> 9	+ 0 9'97	+ I 36 30 <sup>o</sup> 99		60 <sup>o</sup> 15	
				23 <sup>o</sup> 56		11 22 <sup>o</sup> 9	7'14	30 <sup>o</sup> 70		59 <sup>o</sup> 86	
	L. 180 I	21 <sup>o</sup> 60	5 41 <sup>o</sup> 9	1'79	23 <sup>o</sup> 39	52 <sup>o</sup> 55					
		26 <sup>o</sup> 68	3 7 <sup>o</sup> 9	0'54	27 <sup>o</sup> 22	56 <sup>o</sup> 38					
						$\pi - 1^{\circ} 36' 30'' \cdot 84$		56 <sup>o</sup> 38			

NOTE.—R. M. stands for Referring Mark and N. A. for Nautical Almanac.

Observations at Karáchi Observatory—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1855 8th October	$\alpha$ Ursæ Minoris (opp.) (N.A.)	West (contd.)	L. 180 1	0' 1"	+ 1 36 27.90	h m s	' "	0' 1"	$\pi - 1^{\circ} 36' 30''.84$	"	R. 179° 59' 59''.77
			R. 0 1	0' 1"	27.16 19.42 18.48	0 2 57.1 5 50.1 13 28.1 15 18.1	+ 0 0.48 1.87 9.98 12.88	+ 1 36 28.38 29.03 29.40 31.36			
9th October	$\alpha$ Ursæ Minoris (opp.) (N.A.)	East	R. 7 14	0' 1"	- 1 36 25.56	0 12 19.3	- 0 8.36	- 1 36 33.92	$\pi + 1^{\circ} 36' 30''.62$	"	L. 179° 59' 58''.02 R. 179 59 56.51
			L. 187 14	0' 1"	29.72 31.22 32.90	10 10.3 5 19.3 3 11.3	5.70 1.56 0.56	35.42 32.78 33.46			
9th October	$\alpha$ Ursæ Minoris (opp.) (N.A.)	West	R. 7 14	0' 1"	31.56 30.40 26.66 22.24	2 39.7 5 45.7 11 25.7 14 7.7	0.39 1.83 7.20 11.00	31.95 32.23 33.86 33.24	$\pi + 1^{\circ} 36' 30''.40$	"	L. 179° 59' 58''.26 R. 179 59 58.28
			L. 187 14	0' 1"	24.38 25.92 27.78 28.58 26.86 25.62	0 7 6.4 5 35.4 0 17.4 1 19.6 6 19.6 7 56.6	+ 0 2.78 1.72 0.01 0.10 2.21 3.48	+ 1 36 27.16 27.64 27.79 28.68 29.07 29.10			
9th October	$\alpha$ Ursæ Minoris (opp.) (N.A.)	West	R. 7 14	0' 1"	16.90 8.16	16 36.6 18 54.6	15.19 19.68	32.09 27.84	$\pi - 1^{\circ} 36' 30''.17$	"	L. 179° 59' 56''.52 R. 179 59 57.64
			L. 194 25	0' 1"	26.54 27.62 33.10 31.74	0 11 31.1 10 10.1 5 50.1 4 22.1	- 0 7.31 5.70 1.88 1.05	- 1 36 33.85 33.32 34.98 32.79			
10th October	$\alpha$ Ursæ Minoris (opp.) (N.A.)	East	R. 14 26	0' 1"	32.58 32.10 23.18 19.66	2 49.9 5 34.9 11 58.9 14 51.9	0.44 1.72 7.91 12.18	33.02 33.82 31.09 31.84	$\pi + 1^{\circ} 36' 30''.17$	"	L. 179° 59' 56''.52 R. 179 59 57.64
			L. 194 25	0' 1"	26.54 27.62 33.10 31.74	0 11 31.1 10 10.1 5 50.1 4 22.1	- 0 7.31 5.70 1.88 1.05	- 1 36 33.85 33.32 34.98 32.79			

Level readings insufficient



Observations at Karáchi Observatory—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1855											
12th October	$\alpha$ Ur. Min. (opp.) (N.A.)	East (contd.)	L. 208 49	0 1 36 29.54 30.08	Level readings insufficient	h m s	' "	0 1 36 30.29	$\pi + 1^{\circ} 36' 29''.29$	"	R. 179° 59' 58''.42
		R. 28 49	23.24 18.34	0 3 40.9 6 44.9 11 45.9 14 51.9		- 0 0.75 2.51 7.62 12.17	- 1 36 30.29 32.59 30.86 30.51		59.00 56.70 58.43 58.78		
12th October	$\alpha$ Ursæ Minoris (opp.) (N.A.)	West	R. 28 49	+ 1 36 16.66 17.98		0 11 53.8 10 27.8 5 26.8 3 13.8 4 11.2 5 42.2 12 1.2 13 28.2	+ 0 7.80 6.03 1.63 0.57 0.97 1.79 7.96 9.99	+ 1 36 24.46 24.01 24.41 23.33 25.95 24.33 24.20 23.91	$\pi - 1^{\circ} 36' 29''.07$	55.39 54.94 55.34 54.26 56.88 55.26 55.13 54.84	L. 179° 59' 55''.44 R. 179 59 55.07

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	179 59 57.16	
Do. do. do. by Western do.	...	...	...	...	179 59 57.72	
Concluded do. do. by both Elongations	...	...	...	...	179 59 57.44	
Angle R. M. and Mutráni H.S. see page 107—a	...	...	...	+	41 39 11.77	
Observed Azimuth of do.	...	...	...	...	221 39 9.21	
Computed do. do. in terms of the initial value adopted at	}					221 39 10.86
Kalíánpúr, see Addendum						...
Observed—Computed Azimuth	...	...	...	...	— 1.65	

Observations at Karáchi observatory—(Continued.)

At Karáchi Observatory											
May 1855, observed by Lieutenant J. F. Tennant with Troughton and Simms' 36-inch Theodolite.											
Angle between	Circle readings, telescope being set on R. M.										<i>M</i> = Mean of Groups <i>w</i> = Relative Weight <i>C</i> = Concluded Angle
	0°1'	180°1'	7°13'	187°13'	14°25'	194°26'	21°37'	201°37'	28°49'	208°49'	
R.M. & Mutráni H.S.	"	"	"	"	"	"	"	"	"	"	<i>M</i> = 11".77 <i>w</i> = 15.98 $\frac{1}{w}$ = 0.06 <i>C</i> = 41° 39' 11".77
	<i>h</i> 11.94	<i>h</i> 10.14	<i>h</i> 11.88	<i>h</i> 11.34	<i>h</i> 11.18	<i>h</i> 12.76	<i>h</i> 11.80	<i>h</i> 11.06	<i>l</i> 10.42	<i>l</i> 13.02	
	<i>h</i> 10.92	<i>h</i> 10.16	<i>h</i> 11.28	<i>h</i> 12.56	<i>h</i> 12.00	<i>h</i> 11.32	<i>h</i> 11.68	<i>h</i> 12.34	<i>l</i> 10.10	<i>l</i> 12.98	
	<i>h</i> 12.38	<i>h</i> 11.24	<i>h</i> 11.38	<i>h</i> 13.14	<i>h</i> 11.90	<i>h</i> 11.66	<i>h</i> 13.18	<i>l</i> 12.78	<i>l</i> 11.44	<i>l</i> 12.62	
	11.75	10.51	11.70	12.35	11.69	11.91	12.22	12.06	10.65	12.87	

Observations at (XX),

Lat. N. 24° 52' 59".63, Long. E. 67° 11' 51".95 =  $4^{\text{h}} 28^{\text{m}} 47.5^{\text{s}} = 0.187$ , Height above mean sea level 69 feet,

observed by Captain A. Strange

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1853	No. 3906 B.A.C. (opp:) (B.A.C.)	East	R. 0 1	0' 16" 26.36	Level readings insufficient	<i>h</i> 0 16	<i>m</i> 8.9	- 1 18.18	+ 16 24 44.18	π + 8° 53' 46".46	30.64	L. 205° 18' 33".82
				25 53.38		14 57.9	1 7.18	46.20	32.66			
			L. 180 1	25 6.22		8 13.0	0 20.30	45.92	32.38			
				25 2.84		7 16.0	0 15.88	46.96	33.42			
			R. 0 1	24 48.28		2 45.1	0 2.28	46.00	32.46			
4th March				24 46.26		0 22.8	0 0.04	46.22		32.68		

NOTE.—B. A. C. stands for British Association Catalogue, London 1845. (XX) appertains to base-line figures.

Observations at (XX)—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.																							
						In Time	In Arc			Seconds of each observation	Mean by each Face																						
1853	No. 3906 B.A.C. (opp.) (B.A.C.)	East (contd.)	L. 180 1	0 1	+	16	25	0 50	0 5 53.7	-	0 10 49	+ 16 24 50.01	36.47	R. 205° 18' 32".85																			
0 1				25 1.62											7 4.7	0 15.13	46.49	32.95															
0 1				25 36.82											12 35.6	0 47.95	48.87	35.33															
0 1				25 44.00											13 44.6	0 57.13	46.87	33.33															
0 1				26 49.42											20 9.5	2 3.10	46.32	32.78															
0 1				27 9.00											21 32.4	2 20.57	48.43	34.89															
4th March				No. 3906 B.A.C. (opp.) (B.A.C.)											East (contd.)	L. 189 16	0 16	+	16	25	43 98	0 13 59.6	-	0 58.75	+ 16 24 45.23	31.34	L. 205° 18' 30".76						
																	0 16											25 32.70	12 51.6	0 49.63	43.07	29.18	
																	0 16											25 9.34	8 53.7	0 23.78	45.56	31.67	
																	0 16											25 2.66	7 42.7	0 17.88	44.78	30.89	
																	0 16											24 48.68	3 34.8	0 3.86	44.82	30.93	
																	0 16											24 44.50	0 2.8	0 0.00	44.50	30.61	
																	0 16											24 55.28	6 1.1	0 10.94	44.34	30.45	
																	0 16											25 0.94	7 11.0	0 15.58	45.36	31.47	
																	0 16											25 31.94	12 14.9	0 45.35	46.59	32.70	
	0 16	25 39.20	13 32.9		0 55.51	43.69	29.80																										
	0 16	26 30.36	18 55.8		1 48.51	41.85	27.96																										
	0 16	27 19.56	22 28.8		2 33.14	46.42	32.53																										
	5th March	No. 3906 B.A.C. (opp.) (B.A.C.)	East		R. 18 32	0 16	+	16	26	9.64	0 16 43.3	-	1 23.82	+ 16 24 45.82			31.59											L. 205° 18' 30".36					
						0 16																							26 1.90	15 39.3	1 13.49	48.41	34.18
						0 32																							25 21.30	11 15.4	0 38.06	43.24	29.01
0 32				25 13.24		9 58.4									0 29.88	43.36		29.13															
0 32				24 51.88		5 8.5									0 7.96	43.92		29.69															
0 32				24 43.20		0 1.6									0 0.00	43.20		28.97															
0 32				24 54.90		5 35.3									0 9.43	45.47		31.24															
0 32				24 58.66		6 48.3									0 13.99	44.67		30.44															
0 32				25 32.86		12 33.2									0 47.64	45.22		30.99															
0 32				25 42.18		13 48.2									0 57.63	44.55		30.32															
0 32				26 50.80		20 23.1									2 5.88	44.92		30.69															
0 32				27 9.92		21 48.1									2 24.02	45.90		31.67															
6th March				No. 3906 B.A.C. (opp.) (B.A.C.)		East									L. 198 32	0 18		+	18	32	21.30	11 15.4	0 38.06	43.24	29.01	L. 205° 18' 30".36							
																0 18											25 13.24		9 58.4	0 29.88	43.36	29.13	
																0 18											24 51.88		5 8.5	0 7.96	43.92	29.69	
	0 18	24 43.20	0 1.6		0 0.00		43.20	28.97																									
	0 18	24 54.90	5 35.3		0 9.43		45.47	31.24																									
	0 18	24 58.66	6 48.3		0 13.99		44.67	30.44																									
	0 18	25 32.86	12 33.2		0 47.64		45.22	30.99																									
	0 18	25 42.18	13 48.2		0 57.63		44.55	30.32																									
	0 18	26 50.80	20 23.1		2 5.88		44.92	30.69																									
	0 18	27 9.92	21 48.1		2 24.02		45.90	31.67																									
	6th March	No. 3906 B.A.C. (opp.) (B.A.C.)	East		R. 18 32		0 18	+	18	32	21.30	11 15.4	0 38.06	43.24		29.01	L. 205° 18' 30".36																
							0 18																				25 13.24	9 58.4	0 29.88	43.36	29.13		
							0 18																				24 51.88	5 8.5	0 7.96	43.92	29.69		
							0 18																				24 43.20	0 1.6	0 0.00	43.20	28.97		
							0 18																				24 54.90	5 35.3	0 9.43	45.47	31.24		
0 18				24 58.66		6 48.3	0 13.99								44.67			30.44															
0 18				25 32.86		12 33.2	0 47.64								45.22			30.99															
0 18				25 42.18		13 48.2	0 57.63								44.55			30.32															
0 18				26 50.80		20 23.1	2 5.88								44.92			30.69															
0 18				27 9.92		21 48.1	2 24.02								45.90			31.67															



Observations at (XX)—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1853												
7th March	No. 3906 B.A.C. (opp:) (B.A.C.)	East		° ' " L. 207 48 + 16 25 48.00 25 37.20 R. 27 49 25 4.60 25 0.20 L. 207 48 24 48.62 24 45.36 R. 27 49 24 58.98 25 3.60 L. 207 48 25 43.08 25 54.90 R. 27 49 27 11.08 27 28.44		h m s 0 14 39.0 13 20.0 7 54.1 6 50.1 2 19.2 0 1.8 0 0.00 6 25.7 0 12.48 7 38.7 0 17.65 45.36 46.50 45.95 46.10 45.23 44.55 44.50	' " - 1 4.38 0 53.34 0 18.77 0 14.05 0 1.62 0 0.00 0 12.48 0 17.65 0 56.98 1 9.67 2 26.53 2 43.94	° ' " + 16 24 43.62 43.86 45.83 46.15 47.00 45.36 46.50 45.95 46.10 45.23 44.55 44.50	π + 8° 53' 45".43	"	29.05 29.29 31.26 31.58 32.43 30.79 31.93 31.38 31.53 30.66 29.98 29.93	L. 205° 18' 30".62 R. 205° 18' 31".01
10th March	No. 3906 B.A.C. (opp:) (B.A.C.)	West		R. 27 48 + 34 9 58.16 10 16.38 L. 207 48 11 26.06 11 33.92 11 53.54 11 58.20 R. 27 48 12 9.00 12 10.40 12 5.20 12 0.72 L. 207 48 11 45.48 11 38.78	Level readings insufficient	0 20 58.4 19 37.4 12 52.5 11 25.5 7 45.6 6 41.6 0 0.3 1 5.3 4 34.2 5 31.2 9 25.1 10 22.1	+ 2 13.25 1 56.62 0 50.12 0 39.46 0 18.18 0 13.52 0 0.00 0 0.36 0 6.29 0 9.17 0 26.66 0 32.29	+ 34 12 11.41 13.00 16.18 13.38 11.72 11.72 9.00 10.76 11.49 9.89 12.14 11.07	π - 8° 53' 44".25	27.16 28.75 31.93 29.13 27.47 27.47 24.75 26.51 27.24 25.64 27.89 26.82	L. 205° 18' 28".45 R. 205° 18' 26".68	
11th March	No. 3906 B.A.C. (opp:) (B.A.C.)	West		L. 198 32 + 34 10 28.12 10 40.18 R. 18 32 11 22.72 11 29.70 11 52.34 11 56.98		0 18 40.1 17 36.1 12 52.2 11 50.2 8 21.2 7 15.2	+ 1 45.52 1 33.78 0 50.08 0 42.35 0 21.07 0 15.88	+ 34 12 13.64 13.96 12.80 12.05 13.41 12.86	π - 8° 53' 43".89	29.75 30.07 28.91 28.16 29.52 28.97	L. 205° 18' 30".14	

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at (XX)—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1853														
11th March	No. 3906 B.A.C. (opp.) (B.A.C.)	West (Contd.)		$\begin{matrix} \text{°} & \text{' } & \text{''} \\ \text{L. 198} & 32 & + 34 & 12 & 14 \cdot 60 \\ & & & 12 & 12 \cdot 74 \\ & & & 12 & 5 \cdot 98 \\ & & & 12 & 1 \cdot 08 \\ \text{R. 18} & 32 & & 11 & 31 \cdot 84 \\ & & & 11 & 23 \cdot 06 \end{matrix}$	Level readings insufficient	$\begin{matrix} \text{h} & \text{m} & \text{s} \\ 0 & 0 & 0 \cdot 6 \\ & 1 & 11 \cdot 6 \\ & 5 & 23 \cdot 5 \\ & 6 & 34 \cdot 5 \\ 11 & 24 \cdot 4 \\ 12 & 49 \cdot 4 \end{matrix}$	$\begin{matrix} \text{' } & \text{''} \\ + & 0 & 0 \cdot 00 \\ & 0 & 0 \cdot 43 \\ & 0 & 8 \cdot 75 \\ & 0 & 13 \cdot 00 \\ & 0 & 39 \cdot 06 \\ & 0 & 49 \cdot 36 \end{matrix}$	$\begin{matrix} \text{°} & \text{' } & \text{''} \\ + & 34 & 12 & 14 \cdot 60 \\ & & & 13 \cdot 17 \\ & & & 14 \cdot 73 \\ & & & 14 \cdot 08 \\ & & & 10 \cdot 90 \\ & & & 12 \cdot 42 \end{matrix}$	$\pi - 8^{\circ} 53' 43 \cdot 89$	$\begin{matrix} \text{''} \\ 30 \cdot 71 \\ 29 \cdot 28 \\ 30 \cdot 84 \\ 30 \cdot 19 \\ 27 \cdot 01 \\ 28 \cdot 53 \end{matrix}$	R. $205^{\circ} 18' 28 \cdot 52$			
14th March	No. 3906 B.A.C. (opp.) (B.A.C.)	West	$\begin{matrix} \text{°} & \text{' } & \text{''} \\ \text{R. 9} & 16 & + 34 & 10 & 50 \cdot 18 \\ & & & 10 & 59 \cdot 68 \\ \text{L. 189} & 16 & & 11 & 38 \cdot 44 \\ & & & 11 & 44 \cdot 26 \\ & & & 12 & 4 \cdot 52 \\ & & & 12 & 10 \cdot 30 \\ \text{R. 9} & 16 & & 12 & 11 \cdot 86 \\ & & & 12 & 8 \cdot 76 \\ & & & 11 & 57 \cdot 82 \\ & & & 11 & 50 \cdot 24 \\ \text{L. 189} & 16 & & 11 & 8 \cdot 44 \\ & & & 10 & 53 \cdot 52 \end{matrix}$	$\begin{matrix} \text{h} & \text{m} & \text{s} \\ 0 & 16 & 30 \cdot 6 \\ & 15 & 33 \cdot 6 \\ & 11 & 4 \cdot 7 \\ & 9 & 57 \cdot 7 \\ & 5 & 30 \cdot 8 \\ & 4 & 16 \cdot 8 \\ \hline & 0 & 9 \cdot 1 \\ & 2 & 25 \cdot 1 \\ & 6 & 59 \cdot 0 \\ & 8 & 15 \cdot 0 \\ 14 & 40 \cdot 9 \\ 16 & 2 \cdot 8 \end{matrix}$		$\begin{matrix} \text{' } & \text{''} \\ + & 1 & 22 \cdot 49 \\ & 1 & 13 \cdot 24 \\ & 0 & 37 \cdot 10 \\ & 0 & 29 \cdot 98 \\ & 0 & 9 \cdot 17 \\ & 0 & 5 \cdot 53 \\ \hline & 0 & 0 \cdot 00 \\ & 0 & 1 \cdot 76 \\ & 0 & 14 \cdot 67 \\ & 0 & 20 \cdot 46 \\ & 1 & 4 \cdot 65 \\ & 1 & 17 \cdot 19 \end{matrix}$	$\begin{matrix} \text{°} & \text{' } & \text{''} \\ + & 34 & 12 & 12 \cdot 67 \\ & & & 12 \cdot 92 \\ & & & 15 \cdot 54 \\ & & & 14 \cdot 24 \\ & & & 13 \cdot 69 \\ & & & 15 \cdot 83 \\ \hline & & & 11 \cdot 86 \\ & & & 10 \cdot 52 \\ & & & 12 \cdot 49 \\ & & & 10 \cdot 70 \\ & & & 13 \cdot 09 \\ & & & 10 \cdot 71 \end{matrix}$	$\pi - 8^{\circ} 53' 42 \cdot 87$		$\begin{matrix} \text{''} \\ 29 \cdot 80 \\ 30 \cdot 05 \\ 32 \cdot 67 \\ 31 \cdot 37 \\ 30 \cdot 82 \\ 32 \cdot 96 \\ 28 \cdot 99 \\ 27 \cdot 65 \\ 29 \cdot 62 \\ 27 \cdot 83 \\ 30 \cdot 22 \\ 27 \cdot 84 \end{matrix}$		L. $205^{\circ} 18' 30 \cdot 98$ R. $205^{\circ} 18' 28 \cdot 99$		
15th March	No. 3906 B.A.C. (opp.) (B.A.C.)	West	$\begin{matrix} \text{°} & \text{' } & \text{''} \\ \text{L. 180} & 1 & + 34 & 10 & 46 \cdot 60 \\ & & & 10 & 54 \cdot 20 \\ \text{R. 0} & 2 & & 11 & 27 \cdot 60 \\ & & & 11 & 35 \cdot 32 \\ & & & 11 & 58 \cdot 76 \\ & & & 12 & 2 \cdot 80 \\ \text{L. 180} & 1 & & 12 & 15 \cdot 58 \\ & & & 12 & 13 \cdot 40 \\ & & & 11 & 59 \cdot 42 \\ & & & 11 & 53 \cdot 14 \\ \text{R. 0} & 2 & & 11 & 18 \cdot 16 \\ & & & 11 & 8 \cdot 30 \end{matrix}$	$\begin{matrix} \text{h} & \text{m} & \text{s} \\ 0 & 17 & 10 \cdot 6 \\ & 16 & 6 \cdot 6 \\ & 11 & 56 \cdot 7 \\ & 10 & 48 \cdot 7 \\ & 6 & 41 \cdot 8 \\ & 5 & 27 \cdot 8 \\ & 0 & 0 \cdot 9 \\ \hline & 1 & 35 \cdot 1 \\ & 6 & 59 \cdot 0 \\ & 8 & 13 \cdot 0 \\ 13 & 7 \cdot 9 \\ 14 & 17 \cdot 9 \end{matrix}$		$\begin{matrix} \text{' } & \text{''} \\ + & 1 & 29 \cdot 30 \\ & 1 & 18 \cdot 53 \\ & 0 & 43 \cdot 14 \\ & 0 & 35 \cdot 33 \\ & 0 & 13 \cdot 54 \\ & 0 & 9 \cdot 01 \\ & 0 & 0 \cdot 00 \\ \hline & 0 & 0 \cdot 76 \\ & 0 & 14 \cdot 67 \\ & 0 & 20 \cdot 30 \\ & 0 & 51 \cdot 76 \\ & 1 & 1 \cdot 34 \end{matrix}$	$\begin{matrix} \text{°} & \text{' } & \text{''} \\ + & 34 & 12 & 15 \cdot 90 \\ & & & 12 \cdot 73 \\ & & & 10 \cdot 74 \\ & & & 10 \cdot 65 \\ & & & 12 \cdot 30 \\ & & & 11 \cdot 81 \\ & & & 15 \cdot 58 \\ \hline & & & 14 \cdot 16 \\ & & & 14 \cdot 09 \\ & & & 13 \cdot 44 \\ & & & 9 \cdot 92 \\ & & & 9 \cdot 64 \end{matrix}$			$\pi - 8^{\circ} 53' 42 \cdot 52$			$\begin{matrix} \text{''} \\ 33 \cdot 38 \\ 30 \cdot 21 \\ 28 \cdot 22 \\ 28 \cdot 13 \\ 29 \cdot 78 \\ 29 \cdot 29 \\ 33 \cdot 06 \\ 31 \cdot 64 \\ 31 \cdot 57 \\ 30 \cdot 92 \\ 27 \cdot 40 \\ 27 \cdot 12 \end{matrix}$	L. $205^{\circ} 18' 31 \cdot 80$ R. $205^{\circ} 18' 28 \cdot 32$

Observations at (XX)—(Continued.)

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	205° 18' 31.40
Do. do. do. by Western do.	...	...	...	...	205° 18' 29.24
Concluded do. do. by both Elongations	...	...	...	...	205° 18' 30.32
Angle R. M. and (XXI), see page (24)	...	...	...	0° 4' 59".77	
Proportional part of correction to find final value of ditto, see page (24) and triangle No. 719, page 40—a	...	+	0.06	+	0.45983
Observed Azimuth of (XXI)	...	...	...	...	205° 23' 30.15
Computed do. do. in terms of the initial value adopted at Kalíanpúr, see page 59—a	...	...	...	...	205° 23' 31.61
Observed — Computed Azimuth	...	...	...	...	1.46

Observations at XXXVI,

Lat. N. 27° 51' 8".74, Long. E. 68° 28' 41".93 = <sup>h</sup> 4 <sup>m</sup> 33 <sup>s</sup> 54.8 = <sup>d</sup> 0.190, Height above mean sea level 215 feet,

observed by Mr. H. Keelan

with Colonel Waugh's 24-inch Theodolite No. 1 read by 5 micrometer microscopes, the telescope being set on R.M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1858	δ Ur. Min. (conj.) (N.A.)	West	L. 14 24 R. 194 24	0 11 56 31.94	Level readings insufficient	<sup>h</sup> 0 <sup>m</sup> 16 <sup>s</sup> 54.89	0 37.71	0 11 57 9.65	π = 3° 50' 47".14	22.51	L. 188° 6' 22".10
56 44.76				13 51.37		0 25.30	10.06	22.92			
57 7.42				1 46.33		0 0.41	7.83	20.69			
57 8.68				4 18.70		0 2.44	11.12	23.98			

Observations at XXXVI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1858											
23rd December	δ Ur. Min. (conj:) (N.A.)	West (contd.)	L. 14 24	+ 11 56 44.56 56 33.70	Level readings insufficient	h m s 0 13 31.26	' " + 0 24.00	° ' " + 11 57 8.56	π - 3° 50' 47".14	" 21.42	R. 188° 6' 22".62
		R. 194 24	55 31.96 54 55.78	16 19.74 27 23.61 32 1.40		0 34.98 1 38.23 2 14.10	8.68 10.19 9.88	21.54 23.05 22.74			
		L. 14 24	+ 4 16 29.52 16 14.82	0 20 1.53 16 56.01		- 0 52.58 0 37.62	+ 4 15 36.94 37.20	24.27 24.53			
		R. 194 24	15 45.40 15 42.42	5 34.08 2 31.57		0 4.08 0 0.84	41.32 41.58	28.65 28.91			
		L. 14 24	15 44.22 15 51.66	7 57.21 10 55.71		0 8.33 0 15.73	35.89 35.93	23.22 23.26			
		R. 194 24	16 23.20 16 37.04	18 8.93 20 43.37		0 43.42 0 56.62	39.78 40.42	27.11 27.75			
		L. 21 35	+ 11 56 54.74 56 57.82	0 9 44.05 7 16.63		+ 0 12.48 0 6.97	+ 11 57 7.22 4.79	19.29 16.86			
		R. 201 35	57 11.54 57 7.34	2 48.08 6 50.76		0 1.03 0 6.16	12.57 13.50	24.64 25.57			
		L. 21 35	56 38.86 56 27.82	14 54.13 17 53.63		0 29.15 0 42.00	8.01 9.82	20.08 21.89			
		R. 201 35	55 46.10 55 29.36	26 6.02 28 29.43		1 29.21 1 46.24	15.31 15.60	27.38 27.67			
		L. 28 48	+ 11 57 7.66 57 7.90	0 0 53.46 3 23.88		+ 0 0.10 0 1.52	+ 11 57 7.76 9.42	19.49 21.15			
		R. 208 49	56 59.42 56 13.38	12 2.35 21 42.98		0 19.03 1 1.82	18.45 15.20	30.18 26.93			
		L. 28 48	55 9.74 54 51.96	30 13.43 32 30.81	1 59.51 2 18.23	9.25 10.19	20.98 21.92				
		R. 208 49	53 44.58 53 21.60	40 26.16 42 17.47	3 33.39 3 53.30	17.97 14.90	29.70 26.63				
26th December	δ Ursæ Minoris (conj:) (N.A.)	West	L. 28 48	+ 11 57 7.66 57 7.90	0 0 53.46 3 23.88	+ 0 0.10 0 1.52	+ 11 57 7.76 9.42	19.49 21.15		* L. 188° 6' 20".56 * R. 188 6 27 .06	
		R. 208 49	56 59.42 56 13.38	12 2.35 21 42.98	0 19.03 1 1.82	18.45 15.20	30.18 26.93				
		L. 28 48	55 9.74 54 51.96	30 13.43 32 30.81	1 59.51 2 18.23	9.25 10.19	20.98 21.92				
		R. 208 49	53 44.58 53 21.60	40 26.16 42 17.47	3 33.39 3 53.30	17.97 14.90	29.70 26.63				

\* For the remaining observations on these Zeros, see 30th December.

Observations at XXXVI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1858													
26th December	δ Ursæ Minoris (conj.) (N.A.)	East	L. 28 48	+ 4 16 42.70	Level readings insufficient	h m s	' "	° ' "	π + 3° 50' 48".47	"	L. 188° 6' 20".83 R. 188 6 28 .41		
			R. 208 48	16 25.10		0 22 58.86	- 1 9.21	+ 4 15 33.49				21.96	
				15 56.88		19 54.34	0 51.96	33.14				21.61	
				15 49.44		11 42.95	0 18.03	38.85				27.32	
						8 48.46	0 10.19	39.25				27.72	
		L. 28 48	15 32.22	0 47.17		0 0.08	32.14	20.61					
			15 38.78	7 50.36		0 8.09	30.69	19.16					
		R. 208 48	16 11.18	15 12.61		0 30.49	40.69	29.16					
			16 27.90	18 52.23		0 46.95	40.95	29.42					
27th December		δ Ursæ Minoris (conj.) (N.A.)	East	L. 0 1		+ 4 16 25.24	Level readings insufficient	h m s		' "		° ' "	π + 3° 50' 48".80
	R. 180 1			16 10.56	0 19 54.13	- 0 51.94		+ 4 15 33.30	22.10				
				15 45.12	17 31.73	0 40.31		30.25	19.05				
				15 43.44	4 39.56	0 2.85		42.27	31.07				
					2 51.25	0 1.07		42.37	31.17				
	L. 0 1		15 46.26	10 55.08	0 15.70	30.56		19.36					
			15 56.90	14 17.65	0 20.93	29.97		18.77					
	R. 180 1		16 59.42	24 21.35	1 18.24	41.18		29.98					
			17 10.38	26 14.67	1 30.85	39.53		28.33					
28th December	δ Ursæ Minoris (conj.) (N.A.)		West	L. 0 1	+ 11 57 11.40	Level readings insufficient		h m s	' "	° ' "	π - 3° 50' 48".95	"	
		R. 180 1		57 10.92	0 0 45.00		+ 0 0.07	+ 11 57 11.47	22.52				
				56 59.32	3 16.43		0 1.41	12.33	23.38				
				56 48.30	11 30.82		0 17.41	16.73	27.78				
					14 53.39		0 29.10	17.40	28.45				
		L. 0 1	55 30.56	27 53.60	1 41.85		12.41	23.46					
			55 17.30	29 41.90	1 55.41		12.71	23.76					
		R. 180 1	54 18.94	37 2.15	2 59.18		18.12	29.17					
			54 4.66	38 25.38	3 12.78		17.44	28.49					
28th December		δ Ur. Min. (conj.) (N.A.)	East	L. 7 12	+ 4 16 31.50		Level readings insufficient	h m s	' "	° ' "		π + 3° 50' 49".14	"
				16 20.28	0 21 19.71	- 0 59.64		+ 4 15 31.86	21.00				
	R. 187 12			15 55.90	19 1.31	0 47.46		32.82	21.96				
		15 49.22	12 11.15	0 19.50	36.40	25.54							
			9 49.75	0 12.69	36.53	25.67							

\* For the remaining observations on these Zeros, see 30th December.

Observations at XXXVI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1858														
28th December	δ Ur. Min. (conj.) (N.A.)	East (contd.)	L. 7 12	+ 4 15 35 <sup>o</sup> 60 15 49 <sup>o</sup> 50	Level readings insufficient	h m s	' "	o ' "	π + 3° 50' 49".14	"	* R. 188° 6' 27".82			
			R. 187 12	16 41 <sup>o</sup> 62 16 56 <sup>o</sup> 30		0 6 28 <sup>o</sup> 02 12 7 <sup>o</sup> 98 22 17 <sup>o</sup> 71 24 37 <sup>o</sup> 11	- 0 5 <sup>o</sup> 51 0 19 <sup>o</sup> 40 1 5 <sup>o</sup> 55 1 19 <sup>o</sup> 94	+ 4 15 30 <sup>o</sup> 09 30 <sup>o</sup> 10 36 <sup>o</sup> 07 36 <sup>o</sup> 36		19 <sup>o</sup> 23 19 <sup>o</sup> 24 25 <sup>o</sup> 21 25 <sup>o</sup> 50				
29th December	δ Ursæ Minoris (conj.) (N.A.)	West	L. 7 12	+ 11 56 56 <sup>o</sup> 70 57 1 <sup>o</sup> 74			0 10 23 <sup>o</sup> 99 7 41 <sup>o</sup> 53	+ 0 14 <sup>o</sup> 25 0 7 <sup>o</sup> 79		+ 11 57 10 <sup>o</sup> 95 9 <sup>o</sup> 53			21 <sup>o</sup> 55 20 <sup>o</sup> 13	
			R. 187 12	57 14 <sup>o</sup> 30 57 12 <sup>o</sup> 92			0 34 <sup>o</sup> 87 3 31 <sup>o</sup> 37	0 0 <sup>o</sup> 04 0 1 <sup>o</sup> 63		14 <sup>o</sup> 34 14 <sup>o</sup> 55			24 <sup>o</sup> 94 25 <sup>o</sup> 15	
			L. 7 12	56 49 <sup>o</sup> 46 56 38 <sup>o</sup> 62			12 22 <sup>o</sup> 87 15 6 <sup>o</sup> 33	0 20 <sup>o</sup> 13 0 29 <sup>o</sup> 95		9 <sup>o</sup> 59 8 <sup>o</sup> 57			20 <sup>o</sup> 19 19 <sup>o</sup> 17	
			R. 187 12	55 44 <sup>o</sup> 82 55 29 <sup>o</sup> 40			26 10 <sup>o</sup> 21 28 20 <sup>o</sup> 58	1 29 <sup>o</sup> 69 1 45 <sup>o</sup> 16		14 <sup>o</sup> 51 14 <sup>o</sup> 56			25 <sup>o</sup> 11 25 <sup>o</sup> 16	
29th December	δ Ursæ Minoris (conj.) (N.A.)	East	L. 21 35	+ 4 16 46 <sup>o</sup> 32 16 30 <sup>o</sup> 78			0 23 38 <sup>o</sup> 95 21 19 <sup>o</sup> 55	- 1 13 <sup>o</sup> 29 0 59 <sup>o</sup> 62		+ 4 15 33 <sup>o</sup> 03 31 <sup>o</sup> 16			22 <sup>o</sup> 63 20 <sup>o</sup> 76	
			R. 201 35	15 59 <sup>o</sup> 28 15 54 <sup>o</sup> 18			13 9 <sup>o</sup> 17 10 44 <sup>o</sup> 77	0 22 <sup>o</sup> 72 0 15 <sup>o</sup> 17		36 <sup>o</sup> 56 39 <sup>o</sup> 01			26 <sup>o</sup> 16 28 <sup>o</sup> 61	
			L. 21 35	15 40 <sup>o</sup> 84 15 55 <sup>o</sup> 04			7 23 <sup>o</sup> 30 12 32 <sup>o</sup> 17	0 7 <sup>o</sup> 19 0 20 <sup>o</sup> 71		33 <sup>o</sup> 65 34 <sup>o</sup> 33			23 <sup>o</sup> 25 23 <sup>o</sup> 93	
			R. 201 35	16 46 <sup>o</sup> 76 16 59 <sup>o</sup> 98			22 14 <sup>o</sup> 81 24 15 <sup>o</sup> 15	1 5 <sup>o</sup> 27 1 17 <sup>o</sup> 58		41 <sup>o</sup> 49 42 <sup>o</sup> 40			31 <sup>o</sup> 09 32 <sup>o</sup> 00	
30th December	δ Ursæ Minoris (conj.) (N.A.)	West	L. 28 48	+ 11 57 0 <sup>o</sup> 78 57 6 <sup>o</sup> 70			0 8 54 <sup>o</sup> 21 5 35 <sup>o</sup> 65	+ 0 10 <sup>o</sup> 44 0 4 <sup>o</sup> 12		+ 11 57 11 <sup>o</sup> 22 10 <sup>o</sup> 82			21 <sup>o</sup> 48 21 <sup>o</sup> 08	
			R. 208 48	57 10 <sup>o</sup> 16 57 2 <sup>o</sup> 28			6 13 <sup>o</sup> 35 9 31 <sup>o</sup> 92	0 5 <sup>o</sup> 09 0 11 <sup>o</sup> 94		15 <sup>o</sup> 25 14 <sup>o</sup> 22			25 <sup>o</sup> 51 24 <sup>o</sup> 48	
			L. 28 48	56 12 <sup>o</sup> 08 56 0 <sup>o</sup> 54			20 37 <sup>o</sup> 79 23 1 <sup>o</sup> 20	0 55 <sup>o</sup> 80 1 9 <sup>o</sup> 45		7 <sup>o</sup> 88 9 <sup>o</sup> 99			18 <sup>o</sup> 14 20 <sup>o</sup> 25	
			R. 208 48	54 41 <sup>o</sup> 48 54 12 <sup>o</sup> 12			34 18 <sup>o</sup> 11 37 38 <sup>o</sup> 67	2 33 <sup>o</sup> 81 3 5 <sup>o</sup> 10		15 <sup>o</sup> 29 17 <sup>o</sup> 22			25 <sup>o</sup> 55 27 <sup>o</sup> 48	

\* For the remaining observations on these Zeros, see 30th December.

Observations at XXXVI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1858	δ Ursæ Minoris (conj.) (N.A.)	East				<i>h m s</i>	<i>′ ″</i>	<i>° ′ ″</i>	π + 3° 50' 49".94	<i>″</i>	Vide 28th December
L. 7 12			+ 4 16 54.08	0 24 45.79	- 1 20.34	+ 4 15 33.74	23.68				
			16 33.54	21 37.25	1 1.28	32.26	22.20				
R. 187 12			16 0.16	11 42.57	0 18.01	42.15	32.09				
			15 51.54	9 7.13	0 10.93	40.61	30.55				
L. 7 12			15 56.04	12 31.55	0 20.68	35.36	25.30				
			16 3.18	15 2.98	0 29.85	33.33	23.27				
R. 187 12			17 13.60	26 41.96	1 34.03	39.57	29.51				
			17 39.60	30 17.57	2 1.07	38.53	28.47				

Mean Azimuth of R. M. by Eastern Elongation .. .. .	188 6 25.30
Do. do. do. by Western do. .. .. .	188 6 23.53
Concluded do. do. by both Elongations .. .. .	188 6 24.42
Angle R. M. and XXXIX, as below .. .. .	+ 7 44 55.32
Observed Azimuth of XXXIX .. .. .	195 51 19.74
Computed do. do. in terms of the initial value adopted at Kaliánpúr, see page 62—d	195 51 18.48
Observed—Computed Azimuth .. .. .	+ 1.26

At XXXVI

December 1858, observed by Mr. H. Keelan, with Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on R. M.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 2'	7° 12'	187° 12'	14° 24'	194° 25'	21° 35'	201° 35'	28° 48'	208° 48'	
R. M. & XXXIX	<i>h</i> 53.90	<i>l</i> 53.22	<i>l</i> 53.96	<i>l</i> 53.10	<i>h</i> 55.08	<i>l</i> 55.20	<i>l</i> 55.40	<i>h</i> 56.50	<i>h</i> 56.28	<i>l</i> 56.64	M = 55".32 w = 9.00 1/w = 0.11 C = 7° 44' 55".32
	<i>h</i> 54.62	<i>l</i> 53.92	<i>h</i> 55.50	<i>l</i> 54.40	<i>h</i> 56.26	<i>h</i> 54.44	<i>l</i> 55.14	<i>h</i> 56.36	<i>h</i> 57.24	<i>l</i> 56.66	
	<i>h</i> 54.74	<i>l</i> 54.88	<i>h</i> 55.42	<i>l</i> 54.94	<i>h</i> 56.36	<i>h</i> 55.60	<i>l</i> 54.54	<i>h</i> 56.34	<i>h</i> 56.82	<i>l</i> 56.16	
	54.42	54.01	54.96	54.15	55.90	55.08	55.03	56.40	56.78	56.49	

NOTE.—R. M. stands for Referring Mark. N. A. for Nautical Almanac.

Observations at LI,

Lat. N.  $28^{\circ} 8' 55'' \cdot 00$ , Long. E.  $69^{\circ} 19' 38'' \cdot 56 = 4^{\text{h}} 37^{\text{m}} 18^{\text{s}} \cdot 6 = 0 \cdot 193$ , Height above mean sea level 256 feet,

observed by Mr. H. Keelan

with Colonel Waugh's 24-inch Theodolite No. 1 read by 5 micrometer microscopes, the telescope being set on XLVIII.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.		
						In Time	In Arc			Seconds of each observation	Mean by each Face	
1859 3rd April	$\alpha$ Ursæ Minoris (conj:) (N.A.)	West	L. 14 24	- 10 30 7 <sup>12</sup>	Level readings insufficient	<sup>h</sup> 0 21	<sup>m</sup> 56 <sup>s</sup> 20	+ 0 26 <sup>92</sup>	- 10 29 40 <sup>20</sup>	$\pi - 1^{\circ} 37' 55'' \cdot 82$	23 <sup>98</sup>	L. 167 <sup>52</sup> 22 <sup>82</sup> * R. 167 <sup>52</sup> 22 <sup>48</sup> *
				30 1 <sup>08</sup>		19 28 <sup>77</sup>	0 21 <sup>23</sup>	39 <sup>85</sup>	24 <sup>33</sup>			
			R. 194 25	29 43 <sup>68</sup>		9 32 <sup>06</sup>	0 5 <sup>09</sup>	38 <sup>59</sup>	25 <sup>59</sup>			
				29 41 <sup>10</sup>		7 27 <sup>70</sup>	0 3 <sup>11</sup>	37 <sup>99</sup>	26 <sup>19</sup>			
			L. 14 24	29 42 <sup>40</sup>		2 32 <sup>02</sup>	0 0 <sup>36</sup>	42 <sup>04</sup>	22 <sup>14</sup>			
				29 46 <sup>50</sup>		8 12 <sup>00</sup>	0 3 <sup>76</sup>	42 <sup>74</sup>	21 <sup>44</sup>			
		R. 194 25	29 54 <sup>20</sup>	15 21 <sup>23</sup>		0 13 <sup>17</sup>	41 <sup>03</sup>	23 <sup>15</sup>				
			29 58 <sup>92</sup>	17 11 <sup>55</sup>		0 16 <sup>50</sup>	42 <sup>42</sup>	21 <sup>76</sup>				
		East	L. 14 24	- 13 45 4 <sup>36</sup>		0 22 44 <sup>89</sup>	- 0 28 <sup>87</sup>	- 13 45 33 <sup>23</sup>	22 <sup>76</sup>			
				45 9 <sup>22</sup>		20 53 <sup>57</sup>	0 24 <sup>36</sup>	33 <sup>58</sup>	22 <sup>41</sup>			
			R. 194 24	45 24 <sup>94</sup>		12 37 <sup>14</sup>	0 8 <sup>90</sup>	33 <sup>84</sup>	22 <sup>15</sup>			
				45 29 <sup>14</sup>		10 20 <sup>75</sup>	0 5 <sup>98</sup>	35 <sup>12</sup>	20 <sup>87</sup>			
L. 14 24	45 31 <sup>34</sup>		4 45 <sup>85</sup>	0 1 <sup>27</sup>	32 <sup>61</sup>	23 <sup>38</sup>						
	45 29 <sup>42</sup>		6 33 <sup>16</sup>	0 2 <sup>40</sup>	31 <sup>82</sup>	24 <sup>17</sup>						
R. 194 24	45 19 <sup>76</sup>	14 45 <sup>57</sup>	0 12 <sup>19</sup>	31 <sup>95</sup>	24 <sup>04</sup>							
	45 15 <sup>08</sup>	16 25 <sup>86</sup>	0 15 <sup>10</sup>	30 <sup>18</sup>	25 <sup>81</sup>							
4th April	$\alpha$ Ursæ Minoris (conj:) (N.A.)	West	L. 21 35	- 10 30 5 <sup>36</sup>	0 21 40 <sup>29</sup>	+ 0 26 <sup>28</sup>	- 10 29 39 <sup>08</sup>	24 <sup>76</sup>				
				29 58 <sup>68</sup>	19 6 <sup>85</sup>	0 20 <sup>44</sup>	38 <sup>24</sup>	25 <sup>60</sup>				
			R. 201 35	29 46 <sup>96</sup>	10 38 <sup>39</sup>	0 6 <sup>33</sup>	40 <sup>63</sup>	23 <sup>21</sup>				
				29 42 <sup>20</sup>	7 35 <sup>87</sup>	0 3 <sup>23</sup>	38 <sup>97</sup>	24 <sup>87</sup>				
			L. 21 35	29 42 <sup>44</sup>	4 18 <sup>18</sup>	0 1 <sup>04</sup>	41 <sup>40</sup>	22 <sup>44</sup>				
				29 45 <sup>12</sup>	7 27 <sup>73</sup>	0 3 <sup>11</sup>	42 <sup>01</sup>	21 <sup>83</sup>				
		R. 201 35	29 58 <sup>58</sup>	15 31 <sup>12</sup>	0 13 <sup>45</sup>	45 <sup>13</sup>	18 <sup>71</sup>					
			30 0 <sup>74</sup>	17 53 <sup>53</sup>	0 17 <sup>87</sup>	42 <sup>87</sup>	20 <sup>97</sup>					
		East	L. 21 35	- 10 30 5 <sup>36</sup>	0 21 40 <sup>29</sup>	+ 0 26 <sup>28</sup>	- 10 29 39 <sup>08</sup>	24 <sup>76</sup>				
				29 58 <sup>68</sup>	19 6 <sup>85</sup>	0 20 <sup>44</sup>	38 <sup>24</sup>	25 <sup>60</sup>				
			R. 201 35	29 46 <sup>96</sup>	10 38 <sup>39</sup>	0 6 <sup>33</sup>	40 <sup>63</sup>	23 <sup>21</sup>				
				29 42 <sup>20</sup>	7 35 <sup>87</sup>	0 3 <sup>23</sup>	38 <sup>97</sup>	24 <sup>87</sup>				
L. 21 35	29 42 <sup>44</sup>		4 18 <sup>18</sup>	0 1 <sup>04</sup>	41 <sup>40</sup>	22 <sup>44</sup>						
	29 45 <sup>12</sup>		7 27 <sup>73</sup>	0 3 <sup>11</sup>	42 <sup>01</sup>	21 <sup>83</sup>						

\* For the remaining observations on this Zero, see 8th April.



Observations at LI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time,	In Arc			Seconds of each observation	Mean by each Face
1859											
4th April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	East	L. 21 35 R. 201 35	0 1 -13 44 52.78 45 2.36 45 22.36 45 23.66 45 35.88 45 38.06 45 31.08 45 25.74		<i>h m s</i> 0 27 41.13 25 47.81 17 33.39 15 33.05 5 34.33 1 40.66	<i>' "</i> - 0 42.74 0 37.12 0 17.21 0 13.51 0 1.74 0 0.16	0 1 " -13 45 35.52 39.48 39.57 37.17 37.62 38.22 38.93 36.06	$\pi + 1^{\circ} 37' 56''.33$	" 20.81 16.85 16.76 19.16 18.71 18.11 17.40 20.27	L. 167° 52' 18".62 R. 167 52 18.40
5th April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	West	L. 28 48 R. 208 48	-10 30 8.84 30 1.66 29 44.46 29 43.06 29 40.10 29 43.04 29 51.12 29 52.90	Level readings insufficient	0 22 59.17 20 27.74 12 10.31 9 51.91 2 29.21 5 57.81 12 48.99 14 48.33	+ 0 29.56 0 23.43 0 8.29 0 5.45 0 0.35 0 1.99 0 9.18 0 12.24	-10 29 39.28 38.23 36.17 37.61 39.75 41.05 41.94 40.66	$\pi - 1^{\circ} 37' 56''.50$	24.22 25.27 27.33 25.89 23.75 22.45 21.56 22.84	L. 167° 52' 23".92 R. 167 52 24.40
5th April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	East	L. 28 48 R. 208 48	-13 45 5.90 45 11.94 45 23.86 45 28.62 45 38.52 45 35.34 45 30.16 45 27.56		0 24 19.93 20 57.35 12 14.85 9 51.44 0 22.33 2 30.70 11 30.25 13 0.51	- 0 33.03 0 24.51 0 8.38 0 5.43 0 0.01 0 0.35 0 7.41 0 9.47	-13 45 38.93 36.45 32.24 34.05 38.53 35.69 35.57 37.03	$\pi + 1^{\circ} 37' 56''.67$	17.74 20.22 24.43 22.62 18.14 20.98 19.10 19.64	L. 167° 52' 19".27 R. 167 52 21.45
6th April	$\alpha$ Ur. Min. (conj.) (N.A.)	West	L. 0 1 R. 180 2	-10 29 46.84 29 44.50 29 42.32 29 41.28		0 11 24.15 9 4.75 0 56.35 0 20.87	+ 0 7.28 0 4.61 0 0.05 0 0.01	-10 29 39.56 39.89 42.27 41.27	$\pi - 1^{\circ} 37' 56''.84$	23.60 23.27 20.89 21.89	L. 167° 52' 23".59

Observations at LI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.			
						In Time	In Arc			Seconds of each observation	Mean by each Face		
1859	6th April	West (contd.)	α Ursæ Minoris (conj.) (N.A.)	L. 0 1	0 1 "	Level readings insufficient	h m s	i "	o ' "	π - 1° 37' 56".84	"	R. 167° 52' 20".90	
				L. 0 1	-10 29 43'28		0 7 43'14	+ 0 3'33	-10 29 39'95				23'21
					29 46'20		11 26'79	0 7'32	38'88				24'28
				R. 180 2	29 60'56		18 10'95	0 18'46	42'10				21'06
					29 65'72		20 0'26	0 22'34	43'38				19'78
	6th April	East	α Ursæ Minoris (conj.) (N.A.)	L. 0 1	-13 45 14'72	0 20 17'46	- 0 22'98	- 13 45 37'70	19'31				
					45 20'62	16 39'83	0 15'51	36'13	20'88				
				R. 180 1	45 29'46	7 24'24	0 3'06	32'52	24'49				
					45 31'58	5 23'90	0 1'63	33'21	23'80				
				L. 0 1	45 34'14	2 21'44	0 0'31	34'45	22'56				
					45 35'24	4 20'78	0 1'06	36'30	20'71				
7th April	West	α Ursæ Minoris (conj.) (N.A.)	R. 180 1	45 23'30	13 27'35	0 10'13	33'43	23'58					
				45 19'20	16 3'80	0 14'44	33'64	23'37					
			L. 7 12	-10 29 43'70	0 6 52'86	+ 0 2'65	- 10 29 41'05	21'77					
				29 41'08	4 52'51	0 1'33	39'75	23'07					
			R. 187 13	29 43'58	2 22'74	0 0'32	43'26	19'56					
				29 41'18	4 33'11	0 1'16	40'02	22'80					
7th April	East	α Ursæ Minoris (conj.) (N.A.)	L. 7 12	29 48'22	11 9'25	0 6'95	41'27	21'55					
				29 50'22	13 16'61	0 9'85	40'37	22'45					
			R. 187 13	29 65'14	20 7'79	0 22'62	42'52	20'30					
				29 69'24	22 3'12	0 27'14	42'10	20'72					
			L. 7 12	-13 45 19'20	0 17 53'74	- 0 17'88	- 13 45 37'08	20'27					
				45 25'16	15 32'33	0 13'49	38'65	18'70					
7th April	East	α Ursæ Minoris (conj.) (N.A.)	R. 187 13	45 33'48	8 45'16	0 4'28	37'76	19'59					
				45 35'22	5 55'68	0 1'97	37'19	20'16					
			L. 7 12	45 36'44	3 4'87	0 0'53	36'97	20'38					
				45 34'72	6 59'54	0 2'74	37'46	19'89					
			R. 187 13	45 24'42	13 43'70	0 10'55	34'97	22'38					
				45 19'76	15 43'04	0 13'82	33'58	23'77					

Observations at LI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.					
						In Time	In Arc			Seconds of each observation	Mean by each Face				
1859 8th April	α Ursæ Minoris (conj.) (N.A.)	West	L. 14 24	0 1 "	Level readings insufficient	h m s	' "	0 1 "	π - 1° 37' 57".52	"	Vide 3rd April				
				-10 29 39.14								0 2 44.00	+ 0 0.42	-10 29 38.72	23.76
			29 40.24	0 19.59								0 0.01	40.23	22.25	
			R. 194 24	29 43.46								6 23.57	0 2.29	41.17	21.31
			29 43.00	8 26.92								0 3.99	39.01	23.47	
			L. 14 24	29 54.24								15 47.18	0 13.92	40.32	22.16
			29 58.60	18 16.61								0 18.65	39.95	22.53	
			R. 194 24	30 18.06								24 43.72	0 34.12	43.94	18.54
			30 22.50	26 44.06								0 39.87	42.63	19.85	

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	167 52 21.01
Do. do. do. by Western do.	...	...	...	...	167 52 22.68
Concluded do. do. by both Elongations	...	...	...	...	167 52 21.85
Angle R. M. and LIII, see page 73—D	...	...	...	...	29 57 46.87
Proportional part of correction to find final value of ditto, see					
page 73—D and triangle No. 746, page 47—a	...	...	...	0.21 +	29 57 46.66
Observed Azimuth of LIII	...	...	...	...	197 50 8.51
Computed do. do. in terms of the initial value adopted at					
Kaliánpúr, see page 63—a	...	...	...	...	197 50 2.62
Observed—Computed Azimuth	...	...	...	...	+ 5.89

## Observations at LXIII,

Lat. N.  $28^{\circ} 34' 15'' \cdot 20$ , Long. E.  $69^{\circ} 53' 14'' \cdot 09 = 4^{\text{h}} 39^{\text{m}} 32^{\text{s}} \cdot 9 = 0 \cdot 194$ , Height above mean sea level 300 feet,

Observed by Mr. H. Keelan

with Col. Waugh's 24-inch Theodolite No. 1 read by 5 micrometer microscopes, the telescope being set on R.M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1859											
23rd December	$\delta$ Ur. Min. (conj.) (N.A.)	East	L. 14 24	0' 11 36 17.06	Level readings insufficient	h m s	' "	0' 11 36 36.31	$\pi + 3^{\circ} 52' 16'' \cdot 81$	"	L. $172^{\circ} 15' 39'' \cdot 68^*$ R. $172^{\circ} 15' 40'' \cdot 59^*$
				36 23.78		0 12 4.25	0 19.25	40.50			
			R. 194 24	36 36.68		9 49.87	0 12.78	36.56		40.25	
				36 38.80		0 53.37	0 0.10	36.78		40.03	
			L. 14 24	36 20.10		0 56.94	0 0.12	38.92		37.89	
				35 47.60		10 48.60	0 15.49	35.59		41.22	
24th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	West	L. 14 24	- 3 52 27.88	Level readings insufficient	0 13 50.02	+ 0 25.38	- 3 51 62.50	$\pi - 3^{\circ} 52' 16'' \cdot 98$	"	L. $172^{\circ} 15' 39'' \cdot 65$ R. $172^{\circ} 15' 35'' \cdot 51$
				52 18.02		11 3.55	0 16.22	61.80		41.22	
			R. 194 25	52 8.20		1 51.00	0 0.45	67.75		35.27	
				52 8.00		0 48.45	0 0.09	67.91		35.11	
			L. 14 24	52 25.10		12 19.38	0 20.07	65.03		37.99	
				52 33.88		14 59.83	0 29.71	64.17		38.85	
25th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	West	R. 194 25	53 18.92	Level readings insufficient	23 19.23	1 11.71	67.21	$\pi - 3^{\circ} 52' 17'' \cdot 32$	"	L. $172^{\circ} 15' 40'' \cdot 99$ R. $172^{\circ} 15' 35'' \cdot 95$
				53 33.82		25 38.62	1 26.67	67.15		35.81	
			L. 21 35	- 3 52 23.70		0 12 40.96	+ 0 21.33	- 3 51 62.37		40.31	
				52 12.60		10 0.51	0 13.28	59.32		43.36	
			R. 201 36	52 11.36		2 28.25	0 0.81	70.55		32.13	
				52 3.58		0 4.18	0 0.00	63.58		39.10	
			L. 21 35	52 18.08		10 36.96	0 14.90	63.18	$\pi - 3^{\circ} 52' 17'' \cdot 32$	"	L. $172^{\circ} 15' 40'' \cdot 99$ R. $172^{\circ} 15' 35'' \cdot 95$
				52 23.86		12 53.34	0 21.95	61.91		40.77	
			R. 201 36	52 58.50		19 40.48	0 51.08	67.42		35.26	
				53 44.84		27 28.79	1 39.49	65.35		37.33	

\* For the remaining observations on these Zeros, see 29th December.

Observations at LXIII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1859											
25th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	East	L. 28 48 R. 208 48	0 11 36 2'08 36 10'80 36 33'92 36 38'40	Level readings insufficient	<i>h m s</i> 0 16 15'56 13 34'11 5 26'75 3 3'34	' '' - 0 34'91 0 24'32 0 3'92 0 1'24	0 11 36 36'99 35'12 37'84 39'64	$\pi + 3^{\circ} 52' 17'' 49$	" 40'50 42'37 39'65 37'85	L. 172° 15' 42".48 R. 172 15 38'95
26th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	West	L. 28 48 R. 208 48	- 3 52 27'68 52 16'78 52 7'80 52 1'92		0 14 1'00 11 18'54 2 29'06 0 7'66	+ 0 26'06 0 16'96 0 0'82 0 0'00	- 3 51 61'62 59'82 66'98 61'92	$\pi - 3^{\circ} 52' 17'' 67$	40'71 42'51 35'35 40'41	L. 172° 15' 39".99 R. 172 15 36".97
26th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	East	L. 7 12 R. 187 12	- 11 35 54'78 36 8'28 36 35'16 36 34'96		0 17 0'68 14 21'24 6 0'83 3 33'42	- 0 38'21 0 27'22 0 4'78 0 1'67	- 11 36 32'99 35'50 39'94 36'63	$\pi + 3^{\circ} 52' 17'' 84$	44'85 42'34 37'90 41'21	L. 172° 15' 42".61 R. 172 15 38'73
27th December	$\delta$ Ur. Min. (conj.) (N.A.)	West	L. 7 12 R. 187 12	- 3 52 27'14 52 20'06 52 12'94 52 5'92		0 14 31'03 12 14'65 5 19'49 1 41'88	+ 0 27'96 0 19'88 0 3'76 0 0'38	- 3 51 59'18 60'18 69'18 65'54	$\pi - 3^{\circ} 52' 18'' 12$	42'70 41'70 32'70 36'34	L. 172° 15' 40".67

Observations at LXIII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1859 27th December	$\delta$ Ur. Min. (conj.) (N.A.)	West (contd.)	L. 7 12	0' 352 12.36	Level readings insufficient	<i>h m s</i> 0 8 29.84	+ 0' 9.55	- 3 51 62.81	$\pi - 3^{\circ} 52' 18''.12$	"	39.07
				52 18.84		11 3.27	0 16.15	62.69		39.19	
			R. 187 12	52 50.86		18 26.51	0 44.90	65.96		35.92	
				52 57.78		19 52.75	0 52.15	65.63		36.25	
27th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	East	L. 0 1	- 11 35 52.96	0 18 26.21	- 0 44.87	- 11 36 37.83	$\pi + 3^{\circ} 52' 18''.35$	40.52	L. 172° 15' 39".98 R. 172 15 40.24	
				36 8.26	15 45.76	0 32.82	41.08		37.27		
			R. 180 1	36 29.34	7 46.42	0 7.99	37.33		41.02		
				36 33.30	5 22.01	0 3.81	37.11		41.24		
28th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	West	L. 0 1	36 30.96	6 15.94	0 5.20	36.16	$\pi + 3^{\circ} 52' 18''.58$	42.19	L. 172° 15' 36".90 R. 172 15 38.65	
				36 29.24	8 19.29	0 9.18	38.42		39.93		
			R. 180 1	36 3.18	16 33.67	0 36.39	39.57		38.78		
				35 53.02	18 30.00	0 45.41	38.43		39.92		
28th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	West	L. 0 1	- 3 52 30.76	0 14 6.00	+ 0 26.37	- 3 51 64.39	$\pi - 3^{\circ} 52' 18''.58$	37.03	L. 172° 15' 38".78 R. 172 15 41.01	
				52 17.48	11 45.61	0 18.34	59.14		42.28		
			R. 180 1	52 6.18	3 45.26	0 1.87	64.31		37.11		
				52 2.62	2 12.00	0 0.64	61.98		39.44		
28th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	East	L. 0 1	52 16.06	8 26.79	0 9.44	66.62	$\pi + 3^{\circ} 52' 18''.80$	34.80	L. 172° 15' 38".78 R. 172 15 41.01	
				52 21.62	10 11.08	0 13.71	67.91		33.51		
			R. 180 1	52 48.62	18 39.51	0 45.96	62.66		38.76		
				52 56.86	20 21.79	0 54.72	62.14		39.28		
28th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	East	L. 21 35	- 11 35 50.98	0 18 44.77	- 0 46.39	- 11 36 37.37	$\pi + 3^{\circ} 52' 18''.80$	41.43	L. 172° 15' 38".78 R. 172 15 41.01	
				36 7.48	16 6.33	0 34.26	41.74		37.06		
			R. 201 35	36 31.28	6 35.73	0 5.75	37.03		41.77		
				36 34.54	4 57.45	0 3.25	37.79		41.01		
28th December	$\delta$ Ursæ Minoris (conj.) (N.A.)	East	L. 21 35	36 36.70	4 42.17	0 2.93	39.63	$\pi + 3^{\circ} 52' 18''.80$	39.17	L. 172° 15' 38".78 R. 172 15 41.01	
				36 34.70	7 4.57	0 6.64	41.34		37.46		
			R. 201 35	36 4.12	15 44.03	0 32.84	36.96		41.84		
				35 56.84	17 54.39	0 42.55	39.39		39.41		

Observations at LXIII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1859	δ Ursæ Minoris (conj :) (N.A.)	East	L. 14 24	0 11 35 51.98	Level readings insufficient	<i>h m s</i>	<i>' "</i>	<i>° ' "</i>	π + 3° 52' 19".09		Vide 23rd December
0 19 24.39			0 49.71	11 36 41.69		37.40					
16 39.93			0 36.68	41.36		37.73					
6 42.25			0 5.95	38.47		40.62					
5 2.97			0 3.37	39.15		39.94					
8 24.29			0 9.36	39.34		39.75					
10 42.68		0 15.21	39.67	39.42							
L. 14 24		36 29.98									
36 24.46											
R. 194 24		35 58.72									
35 48.68											

Mean Azimuth of R. M. by Eastern Elongation	..	..	..	..	..	..	..	..	..	172	15	40.30
Do. do. do. by Western do.	..	..	..	..	..	..	..	..	..	172	15	38.06
Concluded do. do. by both Elongations	..	..	..	..	..	..	..	..	..	172	15	39.18
Angle R. M. and LXVII, as below	..	..	..	..	..	..	..	..	.. +	15	46	37.12
Observed Azimuth of LXVII	..	..	..	..	..	..	..	..	..	188	2	16.30
Computed do. do. in terms of the initial value adopted at Káliánpúr, see page 64— <sub>d</sub>	..	..	..	..	..	..	..	..	..	188	2	6.34
Observed — Computed Azimuth	..	..	..	..	..	..	..	..	.. +			9.96

At LXIII

December 1859, observed by Mr. H. Keelan with Colonel Waugh's 24-inch Theodolite No. 1.

Angle between	Circle readings, telescope being set on R.M.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 1'	7° 12'	187° 12'	14° 24'	194° 24'	21° 35'	201° 35'	28° 48'	208° 48'	
R.M. & LXVII	"	"	"	"	"	"	"	"	"	"	M = 37".12
	<i>h</i> 37.50	<i>l</i> 39.32	<i>l</i> 38.04	<i>h</i> 35.84	<i>l</i> 36.14	<i>h</i> 37.74	<i>h</i> 36.72	<i>h</i> 36.08	<i>l</i> 38.08	<i>l</i> 35.70	w = 7.80
	<i>h</i> 36.38	<i>l</i> 38.58	<i>h</i> 38.38	<i>l</i> 37.14	<i>l</i> 37.82	<i>h</i> 39.02	<i>h</i> 37.96	<i>h</i> 36.18	<i>l</i> 38.92	<i>l</i> 35.36	$\frac{1}{w} = 0.13$
	<i>h</i> 35.34	<i>l</i> 38.32	<i>h</i> 36.66	<i>l</i> 35.58	<i>l</i> 36.12	<i>h</i> 38.20	<i>h</i> 38.26	<i>h</i> 35.32	<i>l</i> 36.54	<i>l</i> 36.20	C = 15° 46' 37".12
	36.41	38.74	37.69	36.19	36.69	38.32	37.65	35.86	37.85	35.75	

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at XCI,

Lat. N. 29° 33' 20".87, Long. E. 70° 25' 20".16 = <sup>h m s</sup> 4 41 41.3 = <sup>d</sup> 0.196, Height above mean sea level 412 feet,

observed by Lieutenants J. Herschel and H. R. Thuillier

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope

being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.							
						In Time	In Arc			Seconds of each observation	Mean by each Face						
1860	2nd April	West	L. 0 1	+ 1 36 54.56		h m s	i "	o ' "	π - 1° 38' 52".45								
												0 13 48.6	- 0 10.77	+ 1 37 5.33	12.88		
												8 44.6	4.32	7.64	15.19		
												0 2.5	0.00	9.60	17.15		
												69.38	2 19.5	0.31	9.69	17.24	
												61.40	8 50.5	4.41	5.81	13.36	
	3rd April	East	L. 0 1	- 1 40 6.94			h m s	i "	o ' "	π + 1° 38' 52".98							
													13.96	- 0 26.78	- 1 40 33.72	19.26	
													33.42	19 6.1	20.57	34.53	18.45
													37.76	7 43.1	3.36	36.78	16.20
													35.54	4 27.1	1.12	38.88	14.10
													33.24	4 28.9	1.14	36.68	16.30
4th April	West	L. 7 13	+ 1 36 51.72			h m s	i "	o ' "	π - 1° 38' 53".16								
												60.32	0 17 41.0	+ 0 17.67	+ 1 37 9.39	16.23	
												66.18	14 41.0	12.18	12.50	19.34	
												67.34	8 10.0	3.77	9.95	16.79	
													5 39.0	1.80	9.14	15.98	

NOTE.—Observations to Eastern Elongation taken by Lieutenant J. Herschel and those to Western Elongation by Lieutenant H. R. Thuillier.



Observations at XCI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1860	4th April	West (contd.)	L. 7 13	+ 1 36	65° 94'	0 5 39.0	+ 0 1' 80"	+ 1 37 7.74	π - 1° 38' 53".16	14.58	R. 179° 58' 14".52
			R. 187 12		51.46	14 54.1	12.52	3.98		10.82	
					49.22	18 5.1	18.44	7.66		14.50	
4th April	East	L. 7 13	- 1 40	14.00	0 21 23.9	- 0 25.80	- 1 40 39.80	π + 1° 38' 53".39	13.59	15.04	L. 179° 58' 15".91
		R. 187 12		35.08	3 21.8	0.64	35.72		17.47		
		L. 7 13		35.90	0 38.8	0.02	35.92		17.53		
		R. 187 12		33.72	6 9.2	2.14	35.86		17.49		
				30.54	9 44.2	5.36	35.90		16.50		
		R. 187 12		17.62	18 28.2	19.27	36.89		16.82		
				13.20	20 20.2	23.37	36.57				
5th April	West	L. 14 25	+ 1 36	52.26	0 16 41.0	+ 0 15.73	+ 1 37 7.99	π - 1° 38' 53".59	14.40	14.78	L. 179° 58' 14".84
		R. 194 25		62.22	8 50.9	4.42	6.64		14.58		
		L. 14 25		66.46	5 29.9	1.71	8.17		17.26		
		R. 194 25		66.34	8 56.1	4.51	10.85		12.90		
				59.26	11 19.1	7.23	6.49		11.51		
		R. 194 25		45.56	18 37.1	19.54	5.10		12.40		
				42.26	20 31.1	23.73	5.99				
5th April	East	L. 14 25	- 1 40	10.64	0 21 31.3	- 0 26.10	- 1 40 36.74	π + 1° 38' 53".77	17.03	16.96	L. 179° 58' 15".73
		R. 194 25		31.34	8 46.2	4.34	35.68		16.28		
		L. 14 25		35.56	5 51.2	1.93	37.49		13.86		
		R. 194 25		37.38	6 41.8	2.53	39.91		15.08		
				33.82	9 16.8	4.87	38.69		16.92		
		R. 194 25		17.76	18 22.8	19.09	36.85		16.60		
				12.10	21 3.8	25.07	37.17				

Level readings insufficient

Observations at XCI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1860	<i>a</i> Ursæ Minoris (conj.) (N.A.)	West	L. 21 37	0' 36" 53.78	Level readings insufficient	h m s	' "	0' 37" 10.39	$\pi - 1^{\circ} 38' 53''.94$	"	L. 179° 58' 15''.03 R. 179 58 14.83
				+ 1 36 59.88		0 17 8.6	+ 0 16.61	16.45			
			R. 201 37	64.34		14 32.6	11.95	17.89			
				64.34		9 58.6	5.62	16.02			
			L. 21 37	65.14		5 1.6	1.43	11.83			
				62.52		5 1.4	1.42	12.62			
		R. 201 37	56.26	9 1.4		4.59	7.11	13.17			
			51.96	15 30.5		13.56	9.82	15.88			
				17 38.5		17.55	9.51	15.57			
	East	L. 21 37	- 1 40 12.24	0 22 21.2	- 0 28.16	- 1 40 40.40	13.73				
			17.70	18 51.2	20.04	37.74	16.39				
		R. 201 37	37.02	8 43.2	4.29	41.31	12.82				
			39.50	5 20.2	1.61	41.11	13.02				
		L. 21 37	40.52	3 44.8	0.79	41.31	12.82				
			38.26	7 0.9	2.78	41.04	13.09				
	R. 201 37	22.28	18 0.9	18.34	40.62	13.51	15.03				
		16.08	20 10.9	23.02	39.10						
	7th April	<i>a</i> Ursæ Minoris (conj.) (N.A.)	West	L. 28 49	+ 1 36 52.78	0 18 41.7	+ 0 19.75	+ 1 37 12.53	$\pi - 1^{\circ} 38' 54''.29$	"	L. 179° 58' 15''.07 R. 179 58 15.82
					59.30	12 40.6	9.08	8.38		18.24	
				R. 208 49	68.10	7 22.6	3.07	11.17		14.09	
					70.02	3 1.6	0.52	10.54		16.88	
L. 28 49				66.66	4 45.4	1.28	7.94	16.25			
				65.34	7 36.4	3.27	8.61	13.65			
R. 208 49		58.58	13 15.4	9.91	8.49	14.32					
		50.04	18 55.4	20.19	10.23	14.20					
7th April	<i>a</i> Ur. Min. (conj.) (N.A.)	East	L. 28 49	- 1 40 35.20	0 10 1.1	- 0 5.66	- 1 40 40.86	$\pi + 1^{\circ} 38' 54''.47$	"	L. 179° 58' 14''.23	
				38.44	5 51.1	1.93	40.37		13.61		
			R. 208 48	39.44	0 36.1	0.02	39.46		14.10		
				38.76	1 13.9	0.09	38.85		15.01		
						15.62					

Observations at XCI—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.					
						In Time	In Arc			Seconds of each observation	Mean by each Face				
1860	a Ur. Min. (conj:) (N.A.)	East (contd.)	o ' "	o ' "	Level readings insufficient	h m s	' "	o ' "	π	1° 38' 54".47	R. 179° 58' 16".08				
7th April			L. 28 49	- 1 40 40.22								o 6 19.0	- o 2.25	- 1 40 42.47	"
				32.78								8 54.0	4.48	37.26	12.00
			R. 208 48	24.54								15 16.0	13.17	37.71	17.21
		16.78	19 10.0	20.76	37.54	16.76									
										16.93					

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	...	...	...	...	...	179 58 15.62
Do do do by Western do.	...	...	...	...	...	...	...	...	...	179 58 15.27
Concluded do do by both Elongations	...	...	...	...	...	...	...	...	...	179 58 15.45
Angle R. M. and XCIII, as below	...	...	...	...	...	...	...	...	+	59 27 50.97
Observed Azimuth of XCIII	...	...	...	...	...	...	...	...	...	239 26 6.42
Computed do do in terms of the initial value adopted at Kaliánpúr, see page 65— <sub>a</sub>	...	...	...	...	...	...	...	...	...	239 25 54.57
Observed—Computed Azimuth	...	...	...	...	...	...	...	...	+	11.85

At XCI

April 1860, observed by Lieutenants J. Herschel and H. R. Thuillier with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on R. M.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1'	180° 0'	7° 13'	187° 13'	14° 25'	194° 24'	21° 37'	201° 37'	28° 49'	208° 49'	
R.M. & XCIII	"	"	"	"	"	"	"	"	"	"	M = 50".95 w = 8.58 I/w = 0.12 C = 59° 27' 50".97
	h 50.12	l 49.98	l 51.56	l 51.68	h 50.40	h 50.94	h 53.28	h 51.02	h 52.86	h 52.32	
	l 49.92	l 49.24	l 50.06	l 48.94	h 49.76	h 50.80	h 52.60	h 49.92	h 51.68	h 48.76	
	l 50.70	l 51.48	l 51.50	l 49.20	h 51.62	h 50.92	h 50.62	h 49.50	h 52.30	l 52.86	
						h 53.78				l 53.46	
										l 50.40	
	50.25	50.23	51.04	49.94	50.59	50.89	52.57	50.15	52.28	51.56	

Observations at CXII,

Lat. N.  $30^{\circ} 34' 1'' \cdot 87$ , Long. E.  $70^{\circ} 58' 34'' \cdot 47 = 4^{\text{h}} 43^{\text{m}} 54^{\text{s}} \cdot 3 = 0^{\text{d}} \cdot 197$ , Height above mean sea level 490 feet,

Observed by Lieutenant J. P. Basevi

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R.M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1859						<i>h m s</i>	<i>' "</i>	<i>° ' "</i>			
6th April	<i>a</i> Ursæ Minoris (conj.) (N.A.)	West	L. 0 0	+ 77 21 22.50	Level readings insufficient	0 16 5.9	+ 0 14.85	+ 77 21 37.35	$\pi - 1^{\circ} 40' 18'' \cdot 13$	19.22	L. 255° 41' 18".43 R. 255 41 19.51
				21 25.18		13 56.8	11.15	36.33		18.20	
			R. 180 1	21 36.82		6 5.8	2.13	38.95		20.82	
				21 37.62		3 44.8	0.80	38.42		20.29	
			L. 0 0	21 35.38		2 11.2	0.27	35.65		17.52	
				21 28.16		12 21.2	8.73	36.89		18.76	
		R. 180 1	21 18.18	18 20.2		19.22	37.40	19.27			
			21 12.02	20 24.2		23.79	35.81	17.68			
		East	L. 0 0	+ 74 1 45.68		0 28 4.6	- 0 45.01	+ 74 0 60.67		18.99	
				1 37.74		26 10.6	39.13	58.61		16.93	
			R. 180 0	1 18.00		17 48.6	18.14	59.86		18.18	
				1 13.90		15 45.6	14.21	59.69		18.01	
L. 0 0	1 3.54		2 23.4	0.33	63.21	21.53					
	1 3.74		4 52.4	1.36	62.38	20.70					
R. 180 0	1 5.32	11 31.4	7.61	57.71	16.03						
	1 9.18	13 41.4	10.74	58.44	16.76						
7th April	<i>a</i> Ursæ Minoris (conj.) (N.A.)	West	L. 79 13	+ 77 21 14.90	0 19 30.1	+ 0 21.80	+ 77 21 36.70	$\pi - 1^{\circ} 40' 18'' \cdot 48$	18.22		
				21 19.92	17 28.1	17.49	37.41		18.93		
			R. 259 13	21 29.18	11 54.1	8.12	37.30		18.82		
				21 29.32	10 8.1	5.89	35.21		16.73		
			L. 79 13	21 34.58	3 16.1	0.61	35.19		16.71		
				21 36.12	1 6.0	0.07	36.19		17.71		

Observations at CXII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1859											
7th April	$\alpha$ Ur. Min. (conj.) (N.A.)	West (contd.)	R. 259 13	+ 77 21 29.36 21 27.08		h m s 0 7 26.0 10 24.0	' " + 0 3.16 6.19	0 1 " + 77 21 32.52 33.27	$\pi - 1^{\circ} 40' 18''.48$	" 14.04 14.79	R. 255° 41' 16".10
7th April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	East	L. 79 13	+ 74 1 25.74		0 21 26.6	- 0 26.28	+ 74 0 59.46	$\pi + 1^{\circ} 40' 18''.66$	18.12	L. 255° 41' 17".99 R. 255 41 16.57
			R. 259 13	0 58.20 0 57.36		4 26.6 2 30.5	1.13 0.36	57.07 57.00		15.73 15.66	
			L. 79 13	1 0.64 1 3.82		6 5.5 8 6.5	2.03 3.77	58.61 60.05		17.27 18.71	
			R. 259 13	1 14.10 1 15.18		16 17.5 16 57.5	15.21 16.48	58.89 58.70		17.55 17.36	
			L. 79 13	1 25.72		21 30.5	26.51	59.21		17.87	
		West	L. 158 25	+ 77 21 12.70 21 18.60		0 18 59.2 17 0.2	+ 0 20.66 16.57	+ 77 21 33.36 35.17		14.53 16.34	
			R. 338 25	21 31.98 21 31.48		10 10.2 7 51.2	5.93 3.53	37.91 35.01		19.08 16.18	
			L. 158 25	21 32.84		0 21.2	0.01	32.85		14.02	
			R. 338 25	21 32.14 21 29.90 21 26.54 21 4.20		1 38.8 9 16.8 11 26.8 22 35.8	0.16 4.93 7.50 29.18	32.30 34.83 34.04 33.38		13.47 16.00 15.21 14.55	
			L. 237 37	+ 74 1 29.04 1 22.10		0 24 8.1 21 58.1	- 0 33.28 27.59	+ 74 0 55.76 54.51		15.12 13.87	
9th April	$\alpha$ Ursæ Minoris (conj.) (N.A.)	East	R. 57 37	1 12.36 1 9.34		16 27.1 14 52.1	15.48 12.65	56.88 56.69	$\pi + 1^{\circ} 40' 19''.36$	16.24 16.05	L. 255° 41' 13".99 R. 255 41 16.56
			L. 237 37	0 58.94 0 55.92		8 40.1 6 22.1	4.30 2.32	54.64 53.60		14.00 12.96	
			R. 57 37	0 59.52 0 58.80		3 59.9 6 10.9	0.92 2.19	58.60 56.61		17.96 15.97	

Level readings insufficient

Observations at CXII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
						h	m	s	'	"	"			
1859 11th April	$\alpha$ Ursæ Minoris (conj:) (N.A.)	East	L. 316 49	+ 74	I 48.74 I 42.16	Level readings insufficient	0 30 15.8	28 14.8	- 0 52.29	+ 74	0 56.45 56.59	16.51 16.65		
			R. 136 49		I 21.80 I 16.44		20 31.8	24.10		57.70	17.76			
			L. 316 49		I 2.68 I 1.28		18 42.8	20.03		56.41	16.47			
			R. 136 49		0 59.76 I 1.84		10 50.8	6.73		55.95	16.01			
							8 48.8	4.45		56.83	16.89			
							6 9.2	2.17		57.59	17.65			
		12th April	$\alpha$ Ursæ Minoris (conj:) (N.A.)	East	L. 158 26		+ 74	I 46.66 I 41.40	0 30 10.6	28 15.6	- 0 51.99	+ 74	0 54.67 55.79	15.08 16.20
					R. 338 26			I 23.12 I 18.20	21 1.6	25.28		57.84	18.25	
					L. 158 26			I 2.90 I 1.12	18 49.6	20.27		57.93	18.34	
					R. 338 26			0 55.92 0 57.74	11 47.5	7.96		54.94	15.35	
									9 38.5	5.32		55.80	16.21	
									0 36.5	0.02		55.90	16.31	
15th April	$\alpha$ Ursæ Minoris (conj:) (N.A.)	West	L. 237 37	+ 77	2I 27.74 2I 32.50	0 13 24.9	7 34.9	+ 0 10.32	+ 77	2I 38.06 35.80	16.79 14.53			
			R. 57 37		2I 40.96 2I 42.32	2 23.9	0.33		41.29	20.02				
			L. 237 37		2I 32.66 2I 29.70	0 2.9	0.00		42.32	21.05				
			R. 57 37		2I 24.38 2I 21.52	8 46.1	4.40		37.06	15.79				
						10 46.1	6.64		36.34	15.07				
						16 32.1	15.64		40.02	18.75				
		16th April	$\alpha$ Ur. Min. (conj:) (N.A.)	West	L. 316 49	+ 77	2I 21.26 2I 25.34	0 16 49.1	14 39.1	+ 0 16.22	+ 77	2I 37.48 37.65	15.87 16.04	
					R. 136 49		2I 38.34 2I 39.68	8 58.1	4.61		42.95	21.34		
								7 1.1	2.82		42.50	20.89		

L. 255° 41' 16".51  
R. 255 41 17 .41

L. 255° 41' 15".71  
R. 255 41 17 .71

L. 255° 41' 15".54  
R. 255 41 19 .69

L. 255° 41' 16".73

Observations at CXII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1859											
16th April	<i>a</i> Ur. Min. (conj.) (N.A.)	West (contd.)	L. 316 49	0 1 " + 77 21 39.10	Level readings insufficient	<i>h m s</i> 0 0 19.1	<i>' "</i> + 0 0.01	0 1 " + 77 21 39.11	$\pi - 1^{\circ} 40' 21''.61$	" 17.50	R. 255° 41' 20''.08
			R. 136 49	21 38.86		2 8.9	0.27	39.13		17.52	
				21 35.50		10 0.9	5.74	41.24		19.63	
				21 31.70		12 4.9	8.36	40.06		18.45	

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	255 41 16.92
Do. do. do. by Western do.	...	...	...	...	255 41 17.48
Concluded do. do. by both Elongations	...	...	...	...	255 41 17.20
Angle CXV and R. M., as below	...	...	...	...	- 46 20 2.81
Observed Azimuth of CXV	...	...	...	...	209 21 14.39
Computed do. do. in terms of the initial value adopted at Kaliánpúr, see page 67— <sub>a</sub>	...	...	...	...	209 21 8.71
Observed—Computed Azimuth	...	...	...	...	+ 5.68

At CXII

April 1859, observed by Lieutenant J. P. Basevi with Troughton and Simms' 36-inch Theodolite.

Angle between	Circle readings, telescope being set on CXV.										M = Mean of Groups w = Relative Weight C = Concluded Angle
	313° 41'	133° 41'	32° 53'	212° 53'	112° 5'	292° 5'	191° 17'	11° 17'	270° 29'	90° 29'	
CXV & R.M.	"	"	"	"	"	"	"	"	"	"	M = 2".81 w = 17.96 $\frac{l}{w}$ = 0.06 C = 46° 20' 2".81
	<i>l</i> 2.48	<i>l</i> 3.42	<i>h</i> 2.70	<i>l</i> 4.60	<i>h</i> 2.20	<i>l</i> 3.78	<i>l</i> 0.52	<i>l</i> 3.72	<i>l</i> 2.44	<i>l</i> 2.46	
	<i>h</i> 2.50	<i>l</i> 2.62	<i>h</i> 1.04	<i>l</i> 4.04	<i>h</i> 3.26	<i>l</i> 2.36	<i>l</i> 1.70	<i>l</i> 3.22	<i>l</i> 3.54	<i>l</i> 2.44	
	<i>h</i> 3.48	<i>l</i> 3.20	<i>l</i> 2.62	<i>l</i> 3.32	<i>l</i> 3.60	<i>l</i> 2.94	<i>l</i> 1.52	<i>l</i> 3.00	<i>l</i> 2.42	<i>l</i> 2.64	
						<i>l</i> 2.02					
	2.82	3.08	2.12	3.99	3.02	3.03	1.44	3.31	2.80	2.51	

PRINCIPAL TRIANGULATION—AZIMUTHAL OBSERVATIONS.

Observations at CXXVII,

Lat. N. 31° 21' 13''·65, Long. E. 71° 2' 11''·98 = <sup>h m s</sup> 4 44 8·8 = <sup>d</sup> 0·197, Height above mean sea level 554 feet,

observed by Lieutenant J. P. Basevi

with Troughton and Simms' 36-inch Theodolite read by 5 micrometer microscopes, the telescope being set on R. M.

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1858											
23rd December	δ Ursæ Minoris (conj:) (N.A.)	West	L. 0 2	+31 58 35·20 59 1'30	Level readings insufficient	<sup>h m s</sup> 0 29 19·3	+ 1 57·51	+ 32 0 32·71	π - 3° 58' 57"·38	35·33	L. 208° 1' 37"·07 R. 208 1 40·92
		R. 180 2	59 56·14 60 10·28	26 24·3		1 35·28	36·58	39·20			
		L. 0 2	60 29·60 60 35·12	17 28·3		0 41·68	37·82	40·44			
		R. 180 2	60 28·08 60 19·46	14 45·3		0 29·72	40·00	42·62			
				4 56·3		0 3·33	32·93	35·55			
				1 51·3		0 0·47	35·59	38·21			
23rd December	δ Ursæ Minoris (conj:) (N.A.)	East	L. 0 1	+24 4 43·06 4 20·90		0 30 3·2	- 2 2·29	+ 24 2 40·77	π + 3° 58' 57"·57	38·34	L. 208° 1' 38"·39 R. 208 1 39·76
		R. 180 1	2 57·00 2 49·86	27 10·2		1 40·02	40·88	38·45			
		L. 0 1	2 41·50 2 48·52	10 54·2		0 16·16	40·84	38·41			
		R. 180 1	3 21·78 3 34·24	7 49·2		0 8·32	41·54	39·11			
				3 14·8		0 1·44	40·06	37·63			
				7 8·8		0 6·97	41·55	39·12			
28th December	δ Ursæ Minoris (conj:) (N.A.)	West	L. 9 1	+31 58 36·62 59 2·80	0 29 45·2	+ 2 1·01	+ 32 0 37·63	π - 3° 58' 59"·72	37·91	L. 208° 1' 38"·01 R. 208 1 35·66	
		R. 189 0	60 1·30 60 8·18	26 27·2	1 35·64	38·44	38·72				
		L. 9 1	60 34·74 60 36·98	16 4·2	0 35·26	36·56	36·84				
		R. 189 0	60 25·50 60 12·44	14 1·2	0 26·83	35·01	35·29				
				4 19·2	0 2·54	37·28	37·56				
				2 3·2	0 0·58	37·56	37·84				
				8 53·8	0 10·77	36·27	36·55				
				12 29·8	0 21·23	33·67	33·95				



Observations at CXXVII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.				
						In Time	In Arc			Seconds of each observation	Mean by each Face			
1858														
28th December	δ Ursæ Minoris (conj:) (N.A.)	East	L. 9 I	+24 3 57.22 3 37.16	Level readings insufficient	<i>h m s</i> 0 23 59.3	<i>' "</i> - I 18.04	+24 2 39.18 39.26	π + 3° 58' 59".90	39.08 39.16	L. 208° 1' 38".80 R. 208 I 40.79			
R. 189 0			2 56.72 2 49.62	11 14.3 8 17.3		0 57.90 0 17.18	39.54 40.27	39.44 40.17						
L. 9 I			2 37.98 2 41.84	1 34.7 4 6.7		0 0.34 0 2.31	37.64 39.53	37.54 39.43						
R. 189 0			3 16.34 3 31.54	15 59.7 18 58.7		0 34.93 0 49.20	41.41 42.34	41.31 42.24						
29th December		δ Ursæ Minoris (conj:) (N.A.)	West	L. 18 I		+31 59 12.14 59 34.76	0 24 50.6 21 22.6	+ I 24.34 I 2.43		+32 0 36.48 37.19		π - 3° 59' 0".08	36.40 37.11	L. 208° 1' 37".76 R. 208 I 35.01
R. 198 I				60 18.92 60 25.14		11 32.6 8 46.6	0 18.18 0 10.51	37.10 35.65		37.02 35.57				
L. 18 I				60 39.16 60 32.88		0 18.4 6 26.4	0 0.01 0 5.65	39.17 38.53		39.09 38.45				
R. 198 I			59 43.52 59 28.04	19 14.4 22 1.4		0 50.25 I 5.81	33.77 33.85	33.69 33.77						
29th December	δ Ursæ Minoris (conj:) (N.A.)		East	L. 18 I	+24 4 45.24 4 21.98	0 30 29.5 27 38.5	- 2 5.89 I 43.53	+24 2 39.35 38.45	π + 3° 59' 0".27	39.62 38.72	L. 208° 1' 38".08 R. 208 I 36.93			
R. 198 I				2 56.58 2 49.42	13 4.5 9 26.5	0 23.24 0 12.13	33.34 37.29	33.61 37.56						
L. 18 I		2 38.36 2 43.26		3 47.5 6 44.5	0 1.96 0 6.20	36.40 37.06	36.67 37.33							
R. 198 I		3 31.30 3 48.24		19 50.6 22 35.6	0 53.79 I 9.74	37.51 38.50	37.78 38.77							
30th December	δ Ur. Min. (conj:) (N.A.)	East	L. 27 I	+24 4 17.66 3 52.28	0 27 2.4 23 14.4	- I 39.09 I 13.26	+24 2 38.57 39.02	π + 3° 59' 0".62	39.19 39.64	L. 208° 1' 39".23				
R. 207 I			3 3.86 2 54.88	13 39.4 11 3.4	0 25.35 0 16.63	38.51 38.25	39.13 38.87							

Observations at CXXVII—(Continued.)

Astronomical Date	Star's name and Catalogue employed	Elongation	Face and Zero	Observed Angle Star and R. M.	Correction for Collimation and Level errors	Interval from Elongation		Corrected Angle Star at Elongation and R. M.	Azimuth of Star at Elongation	Azimuth of R. M.	
						In Time	In Arc			Seconds of each observation	Mean by each Face
1858	δ Ur. Min. (conj.) (N.A.)	East (contd.)	L. 27 I	0' 24" 2 38' 20"	Level readings insufficient	h m s	' "	0' 24" 2 38' 02"	π + 3° 59' 062	"	R. 208° 1' 39".30
R. 207 I			2 39' 24"	0 1 9.4		- 0 0' 18"	38' 81"	38' 64"			
			3 1' 52"	1 46.6		0 0' 43"	38' 81"	39' 43"			
			3 8' 64"	12 36.6		0 21' 70"	39' 82"	40' 44"			
1859	δ Ursæ Minoris (conj.) (N.A.)	West	L. 27 I	+31 59 58' 58"	Level readings insufficient	0 17 29.9	+ 0 41' 82"	+32 0 40' 40"	π - 3° 59' 1".23	"	L. 208° 1' 37".40 R. 208 1 38.60
R. 207 I			60 20' 16"	11 28.9		0 17' 99"	38' 15"	36' 92"			
			60 37' 52"	5 3.9		0 3' 50"	41' 02"	39' 79"			
			60 39' 68"	1 27.9		0 0' 29"	39' 97"	38' 74"			
			60 30' 08"	8 9.1		0 9' 04"	39' 12"	37' 89"			
			60 19' 38"	11 20.1		0 17' 47"	36' 85"	35' 62"			
			R. 207 I	59 46' 82"		19 48.1	0 53' 23"	40' 05"			
				59 26' 30"		23 2.1	1 11' 98"	38' 28"			

Mean Azimuth of R. M. by Eastern Elongation	...	...	...	...	208 1 38.91
Do. do. do. by Western do.	...	...	...	...	208 1 37.55
Concluded do. do. by both Elongations	...	...	...	...	208 1 38.23
Angle R. M. and CXXX, see page 158— <sub>D</sub>	...	...	...	0 5 30.66	
Proportional part of correction to find final value of ditto, see					
page 158— <sub>D</sub> and triangle No. 807, page 55— <sub>a</sub>	...	-	0' 02"	+	0 5 30.64
Observed Azimuth of CXXX	...	...	...	...	208 7 8.87
Computed do. do. in terms of the initial value adopted at					
Kaliánpúr, see page 67— <sub>a</sub>	...	...	...	...	208 7 4.76
Observed—Computed Azimuth	...	...	...	...	4.11

## ADDENDUM.

## PRINCIPAL TRIANGULATION. GREAT INDUS SERIES.

## GEODETIC ELEMENTS OF THE KARACHI OBSERVATORY AND MANORA POINT.

## TRIANGLES.

No. of triangle		Station	Spherical Excess	Corrections to Obsd. Angle	Corrected plane angle	Distance		
Circuit	Non-circuit			Figure		Log. feet	Feet	Miles
	821	(XXI) (XXII) Mutráni H.S.	" 0'17 '17 '17 ·51	" + 0'688 + '582 + '530	o ' " 41 51 11'518 59 54 34'752 78 14 13'730 180 0 0'000	4'6151189,5 4'7279815,6 4'7816296,5	41221'04 53454'17 60482'49	7'807 10'124 11'455
	822	(XXII) Mutráni H.S. A: H.S.	0'07 '07 '07 ·21	+ 0'202 + '156 + '312	54 33 47'872 40 4 38'976 85 21 33'152 180 0 0'000	4'5275730,3 4'4253116,6 4'6151189,5	33695'59 26626'35 41221'04	6'382 5'043 7'807
	823	Mutrání H.S. A: H.S. Karáchi obsy.	0'07 '07 '07 ·21	+ 0'129 + '052 + '129	71 5 46'389 46 12 24'592 62 41 49'019 180 0 0'000	4'5547906,8 4'4373127,9 4'5275730,3	35874'90 27372'40 33695'59	6'794 5'184 6'382
	824	Mutrání H.S. A: H.S. Manora Point	0'12 '12 '11 ·35	- 0'31 - '31 - '31	65 57 56'97 71 39 23'53 42 22 39'50 180 0 0'00	4'6595187,5 4'6762557,5 4'5275730,3	45658'19 47452'14 33695'59	8'647 8'987 6'382

NOTE.—(XXI) and (XXII) appertain to base-line figures.

## Geodetic elements of the Karáchi Observatory and Manora Point—(Continued).

## LATITUDES, LONGITUDES AND AZIMUTHS.

Fixed Station A				Deduced Station B			
Circuit No.	Series No. or Station	Azimuth of B	A to B in Log. feet	Series No. or Station	Latitude North	Longitude East of Greenwich	Azimuth of A
		° ' "			° ' "	° ' "	° ' "
	(XXI)*	51 8 23'90	4'7279815,6	Mutráni H.S.	24 53 12'83	67 7 19'90	231 5 13'32
	"	92 59 35'59	4'7816296,5	(XXII)	24 59 16'15	67 3 55'43	272 54 58'29
	(XXII)	27 23 21'16	4'4253116,6	A : H.S.	24 55 21'93	67 1 42'35	207 22 25'01
	"	332 49 33'21	4'6151189,5	Mutráni H.S.			152 50 59'42
	Mutráni H.S.	41'40 33'92	4'4373127,9	Karáchi Obsy.	24 49 50'25	67 4 2'31	221 39 10'86
	"	46 48 23'29	4'6762557,5	Manora Point.	24 47 50'93	67 1 4'43	226 45 45'55
	"	112 46 20'38	4'5275730,3	A : H.S.			292 43 58'23
	A : H.S.	4 23 21'88	4'6595187,5	Manora Point.			184 23 5'94
	"	338 56 22'90	4'5547906,8	Karáchi Obsy.			158 57 21'77

NOTE.—(XXI) and (XXII) appertain to base-line figures. \* For Geodetic Elements of this station see page 59—d.

## DESCRIPTIONS.

MUTRÁNI HILL STATION is on a peak on the low range of hills between the Karáchi Observatory and the Karáchi base-line. The road from Karáchi to Tattah passes to the south of the hill and that from Karáchi to Kotri to the north.

The pillar is solid and 5 feet high. It has a mark-stone at the surface.

A : HILL STATION is on a peak slightly west of the direction of the street in the Karáchi Cantonment. It is a conspicuous point being higher than any in the neighbourhood.

The mark-stones are embedded in a paka pillar, which is solid and isolated.

KARÁCHI Observatory is on Bath Island. The so called island is an isolated hill situated about half way between the Karáchi Church and the Sanatorium of Clifton. It is nearly surrounded by the sea at each high water and at the highest spring-tides is completely so.

The pillar is solid and sunk, having its upper surface flush with the flooring. There are two other marks in the pillar about 3' 8" and 7' 8" below its upper mark.

MANORA POINT or Manora G. T. Survey Bench-Mark is on a sand heap lying between the pier and deep-water point on which a battery is erected.

The pillar is solid and has a mark-stone at the top which, besides the station mark, has  $\frac{G.T.S.}{B.M.}$  engraved on its surface.

J. B. N. HENNESSEY.

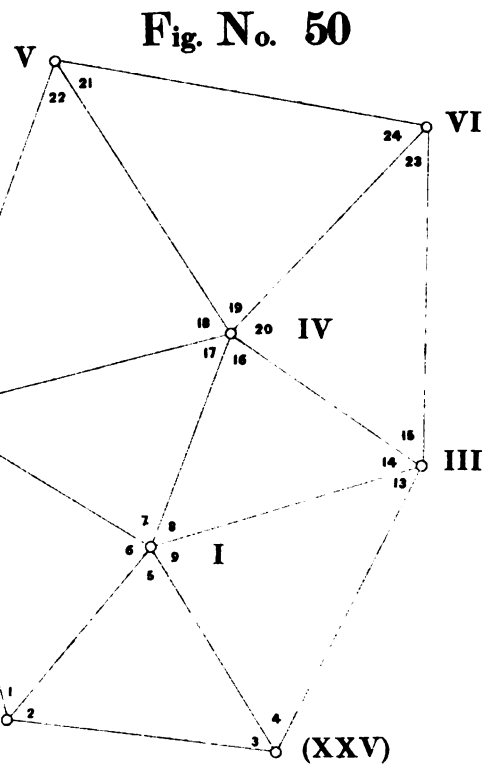
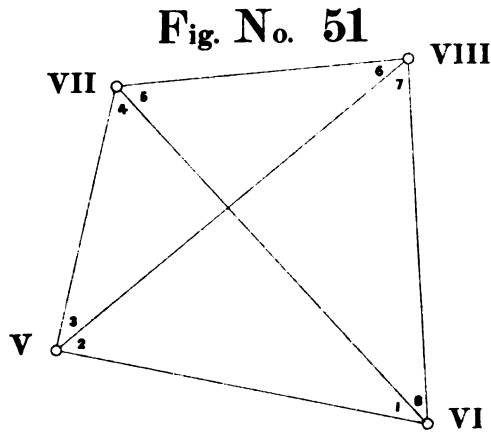
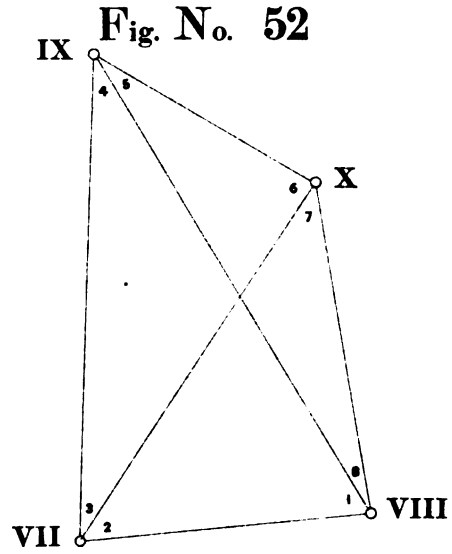
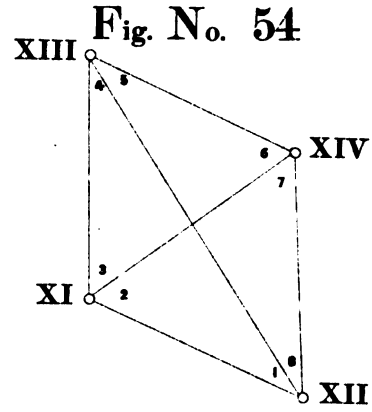
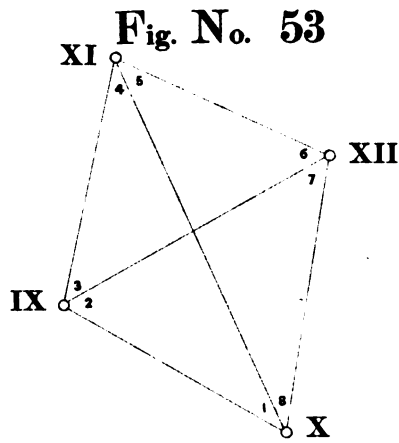
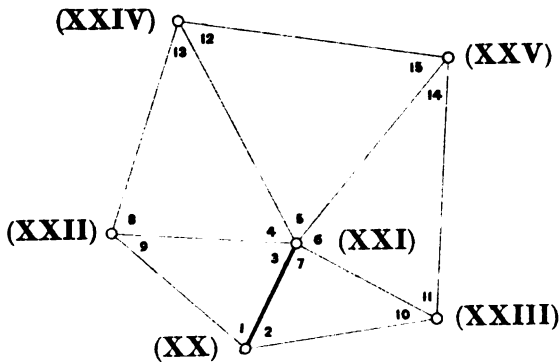


Fig. No. 49 Karachi Base-line Figure.



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



Fig. No. 60

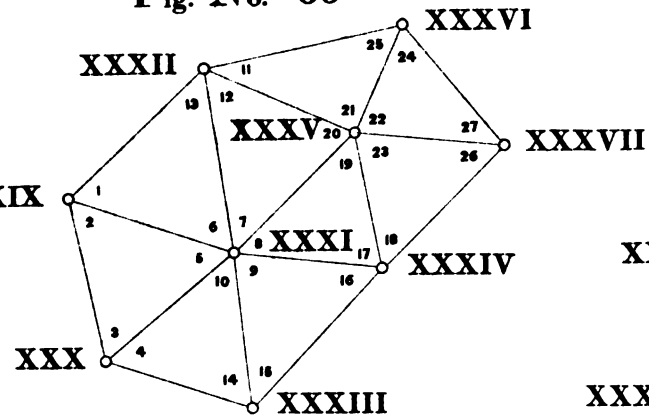


Fig. No. 61

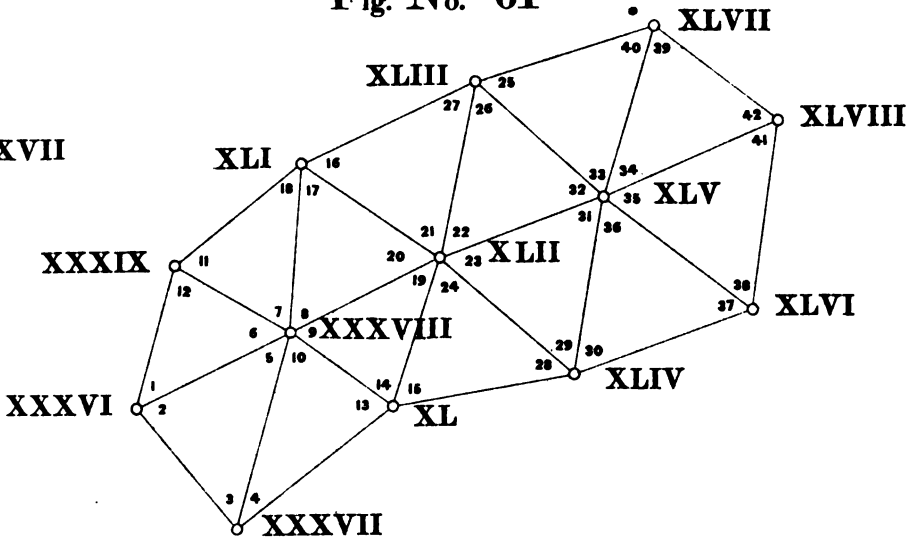


Fig. No. 58

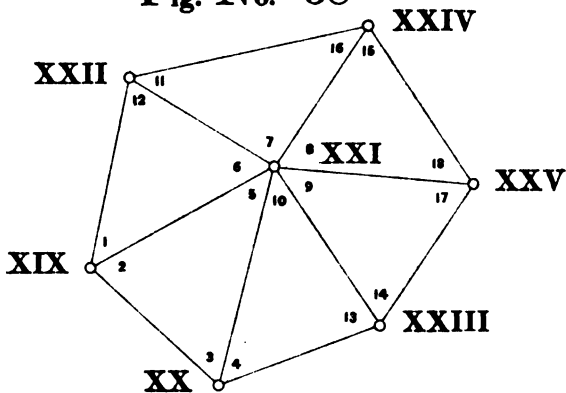


Fig. No. 59

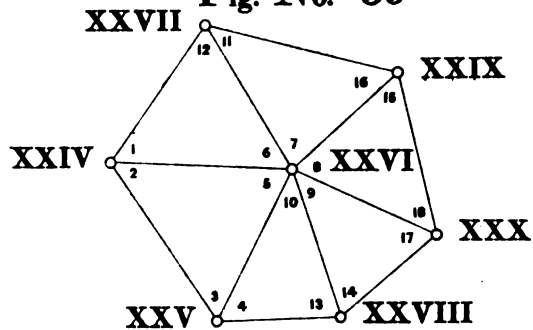


Fig. No. 55

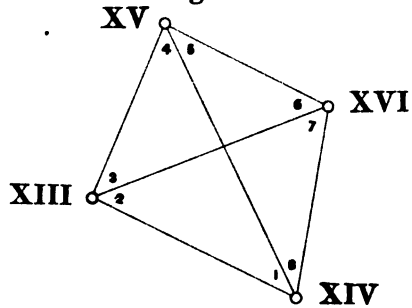


Fig. No. 56

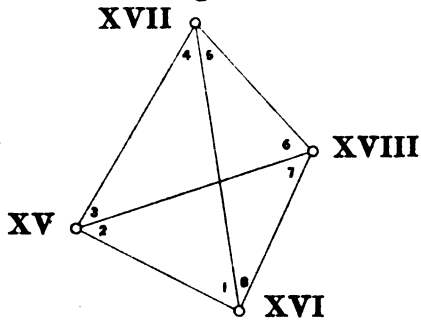
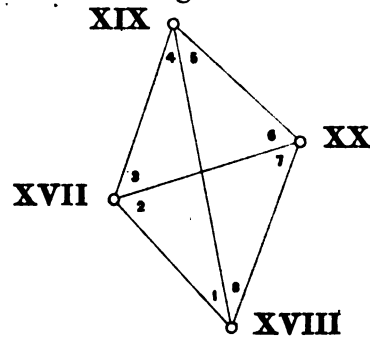


Fig. No. 57



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$





Fig. No. 66

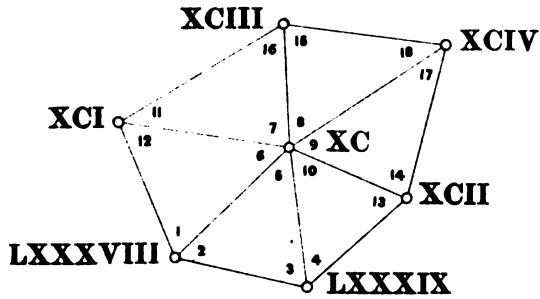


Fig. No. 67

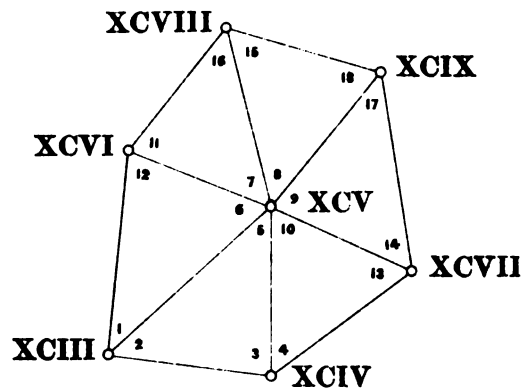


Fig. No. 64

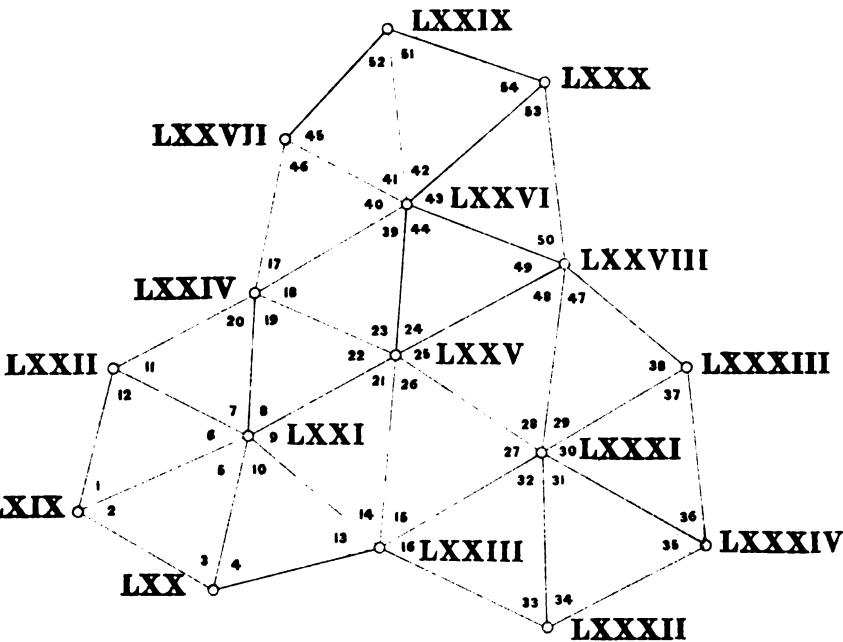


Fig. No. 65

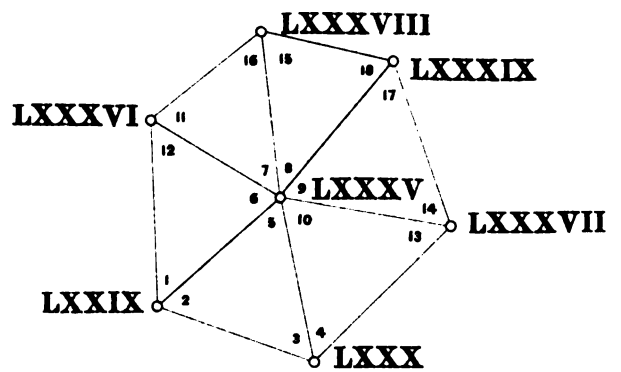


Fig. No. 62

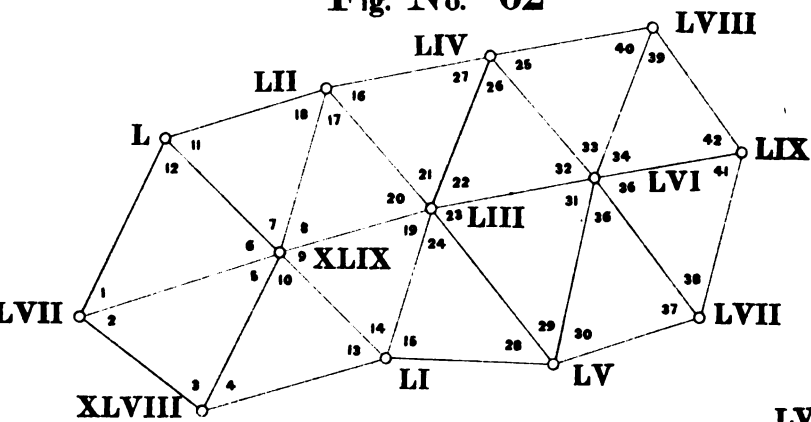
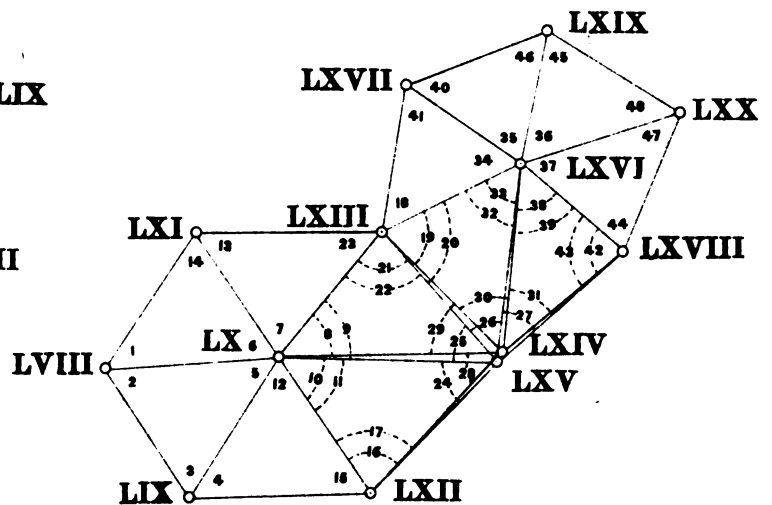
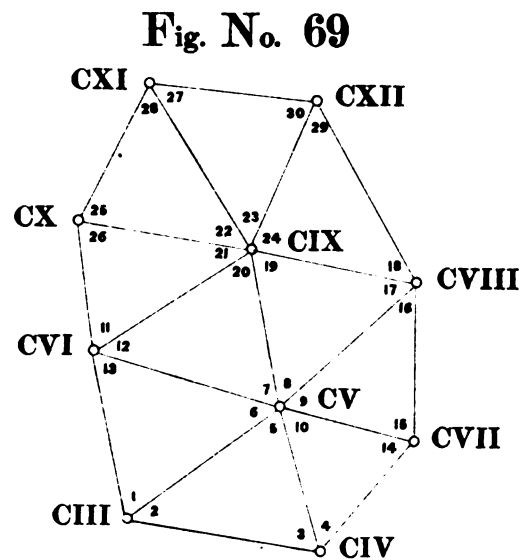
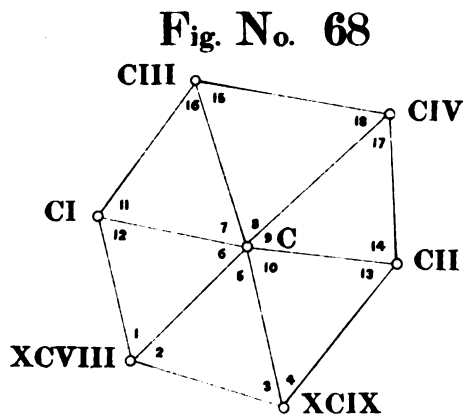
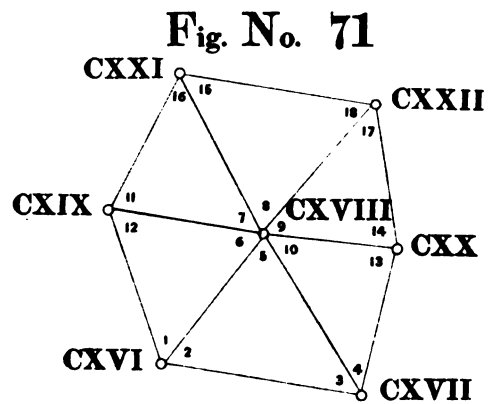
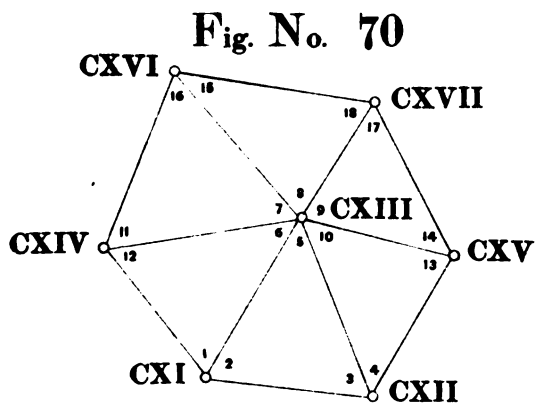
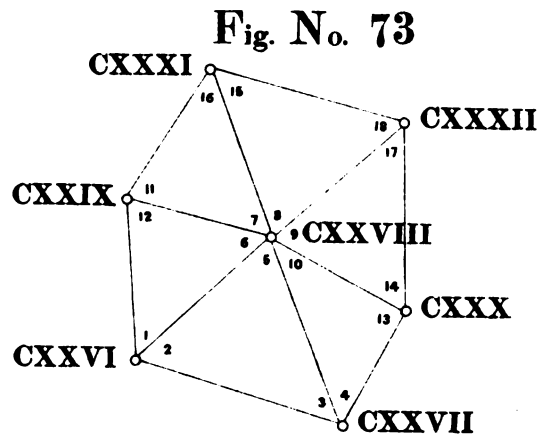
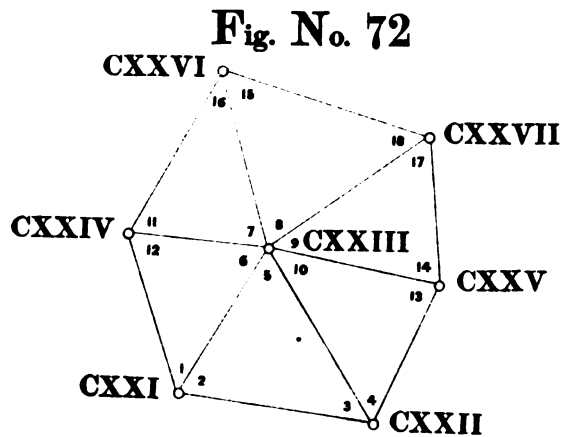


Fig. No. 63



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$





Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



Fig. No. 76

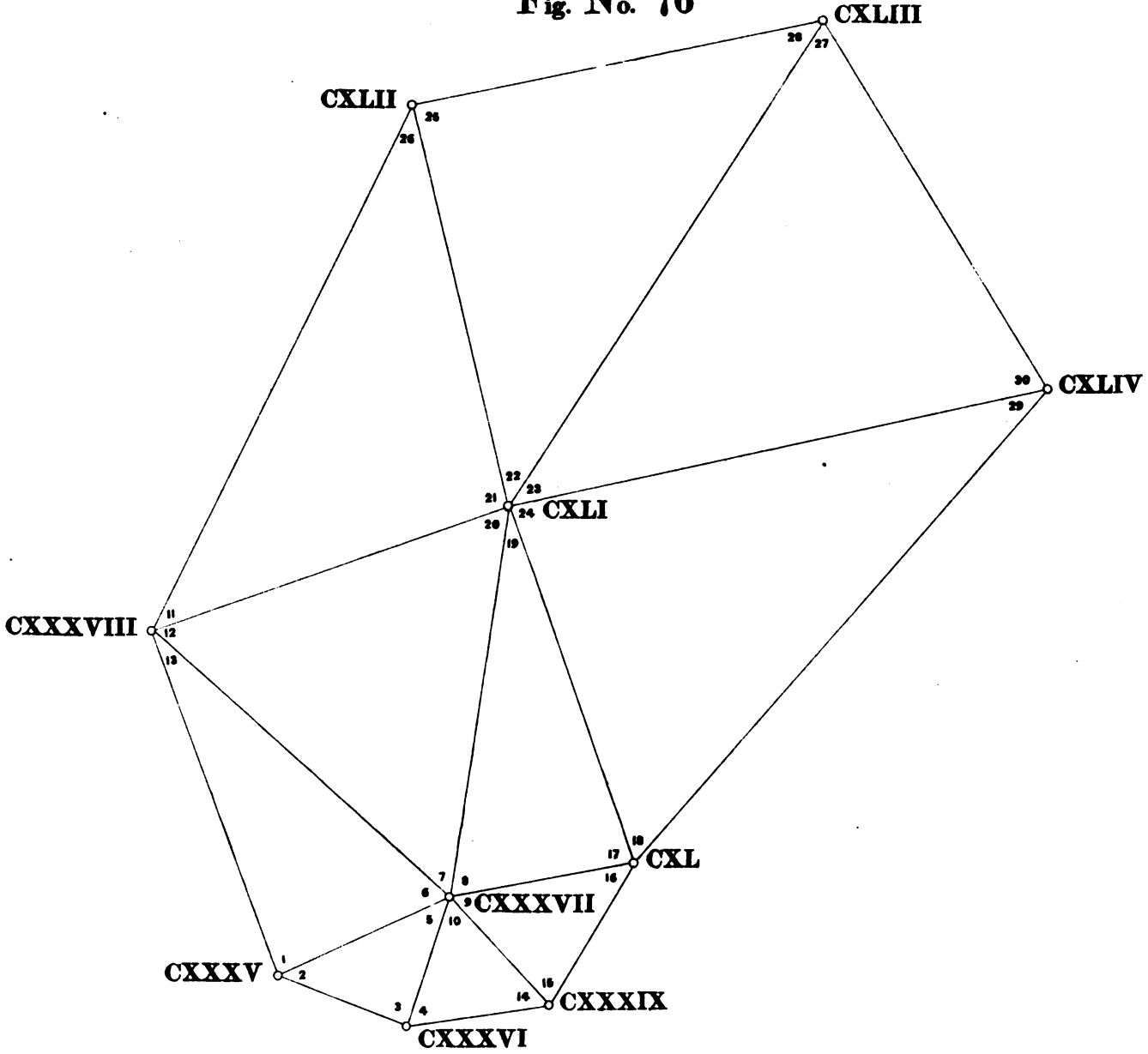


Fig. No. 75

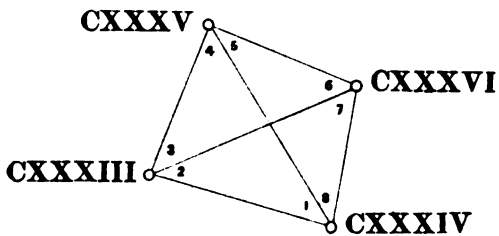
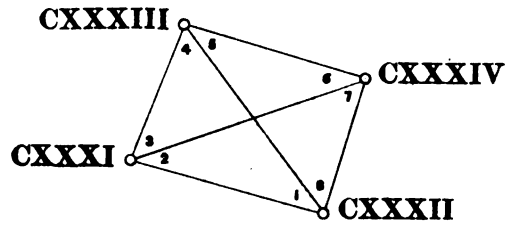


Fig. No. 74



Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$



Fig. No. 78 Chach Base-line Figure

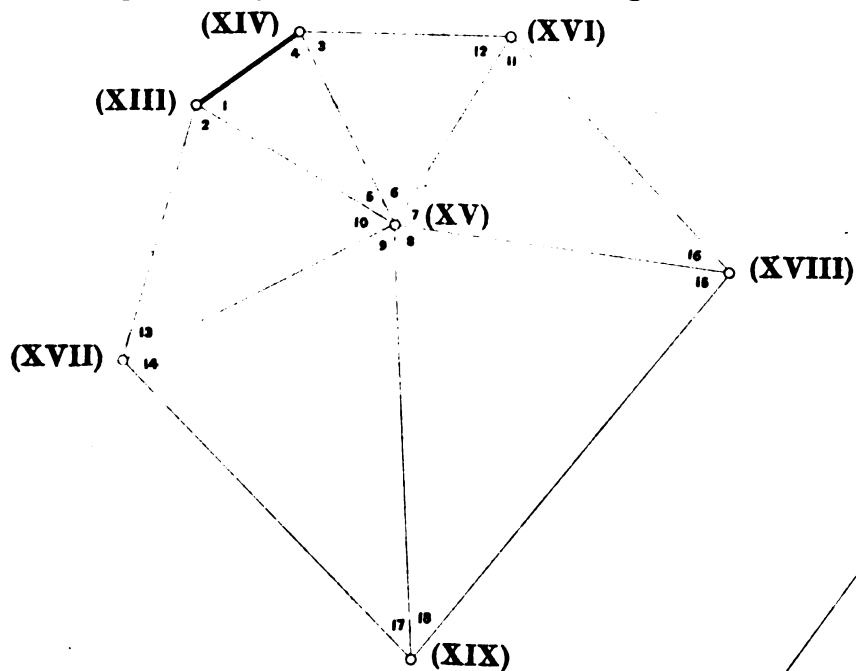
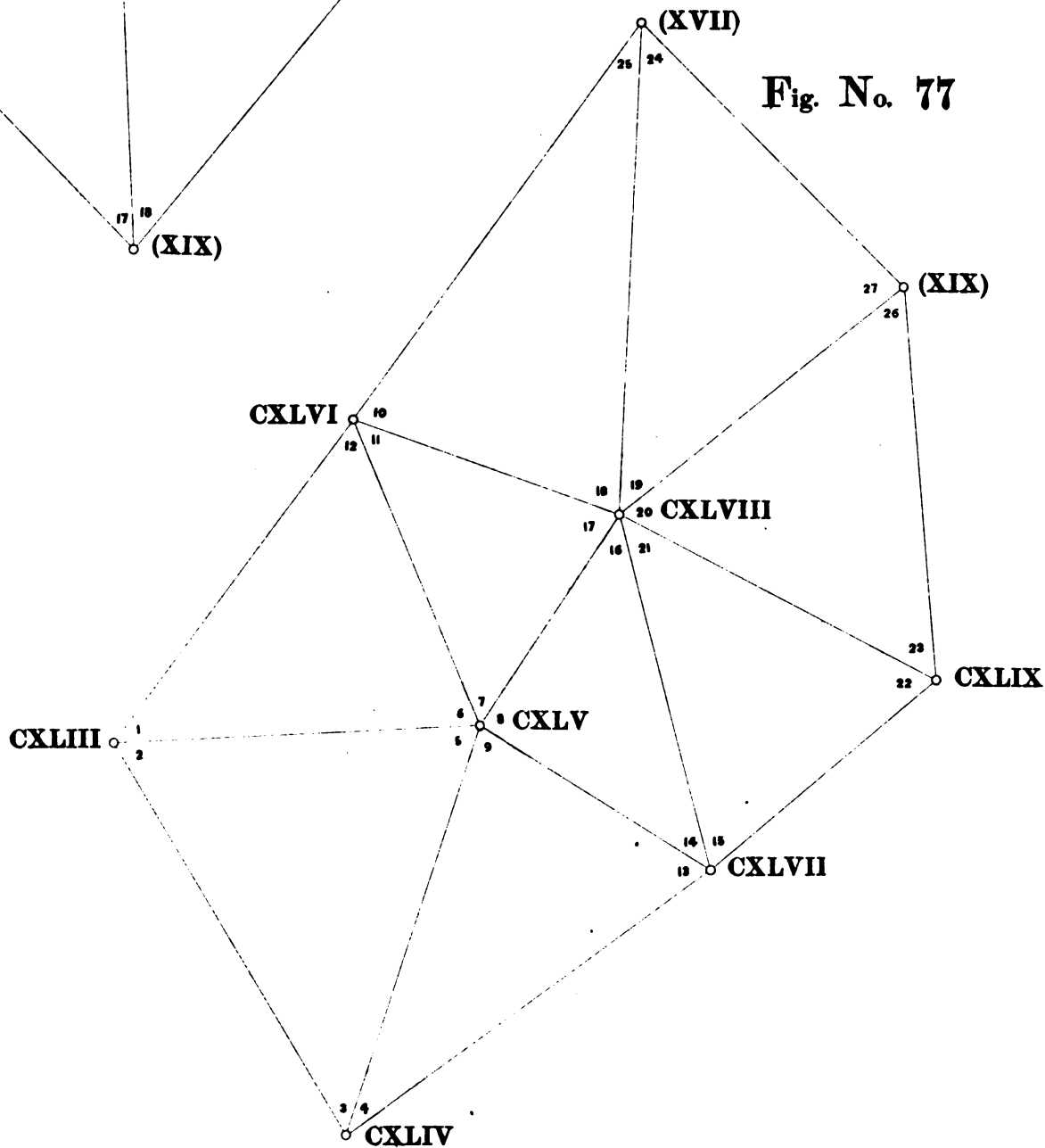


Fig. No. 77

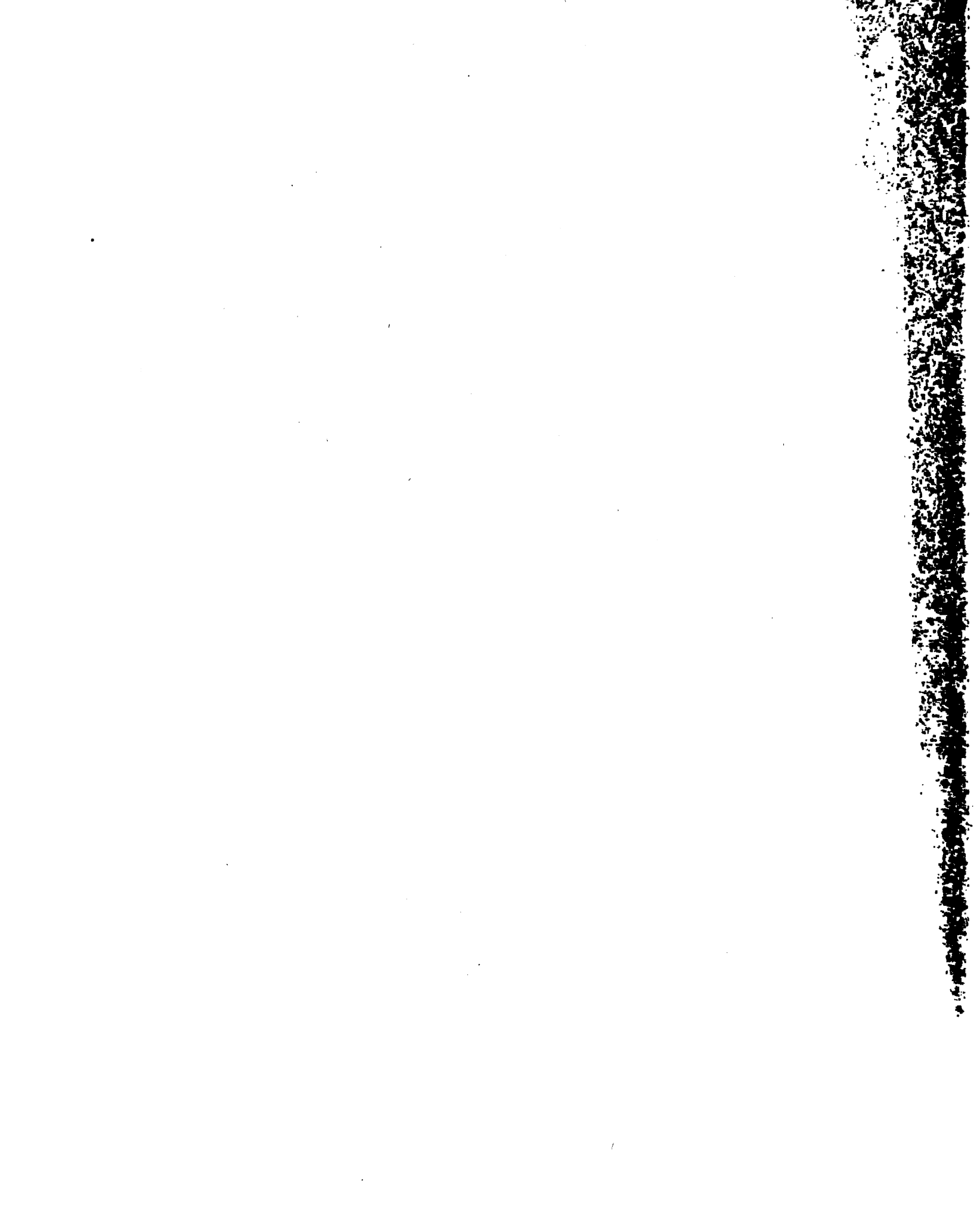


Scale 1 Inch = 12 Miles or  $\frac{1}{760320}$













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