ACCOUNT OF THE OPERATIONS OF

THE GREAT TRIGONOMETRICAL SURVEY OF INDIA

VOLUME XIII.

DETAILS OF THE

PRINCIPAL TRIANGULATION

OF FIVE OF THE COMPONENT SERIES OF

THE SOUTHERN TRIGON

INCLUDING THE FOLLOWING SERIES;

THE SOUTH KONKAN COAST

THE MANGALORE MERIDIONAL | THE SOUTH-EAST COAST

THE MADRAS MERIDIONAL AND COAST | THE MADRAS LONGITUDINAL

PREPARED UNDER THE DIRECTIONS OF

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PREFACE.

This volume forms the thirteenth of that series of publications, known as the *"Account of the Operations of the Great Trigonometrical Survey of India"*, of which the design is, as has already been stated in the second volume of the series, "to give full reports—historical and descriptive—of the nature and the general "procedure of the operations; to describe the instruments which were employed in executing the several "linear and angular measurements; to furnish complete details of the actual facts of observation and the "methods of reduction by which these facts have been combined together and duly harmonized; and, lastly "to give the results which have been arrived at after the final reduction of the operations."

The present volume and the one immediately preceding it—Volume XII—are devoted to the details of that section of the Principal Triangulation known as the Southern Trigon. Vol. XII gives a sketch of the general principles in accordance with which the operations have been conducted, indicates the formulæ employed in the calculations and gives full details—explanatory and numerical—of the Simultaneous Reduction of the seven chains of triangles included in the Trigon; it also gives full numerical details of two of these chains. The numerical details of the remaining five chains are given in the present volume.

The two chains of which the details are given in Volume XII are:—

A. The Great Arc Series, Section 8° to 18°.
B. The Bombay Longitudinal Series.

The five chains of which the details are given in the present volume are:—

C. The South Konkan Coast Series.
D. The Mangalore Meridional Series.
E. The Madras Meridional and Coast Series.
F. The South-East Coast and Ceylon Branch Series.
G. The Madras Longitudinal Series.

Reference should be made to the Preface to Volume XII for a general explanation of the information and numerical data which the present volume furnishes for each series of triangles; also for a description of the system adopted in the orthography of Indian names.

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-foot Bar **A**, the relations between which and the principal European Standards of Length are given at page 28 of Volume I.

(2). The adopted Elements of the Figure of the Earth—assumed to be spheroidal—are given at page 21 of Volume XII.

(3). The Longitudes depend on an astronomically determined value of the Longitude of the Madras Observatory, East of the Royal Observatory at Greenwich, which was deduced about the year 1815. The Longitude of the Madras Observatory was subsequently determined by the Electro-Telegraphic method, by observations made at Greenwich, Mokattam (in Egypt), Suez, Aden, Bombay and certain stations of the triangulation in India, and with the following preliminary results :—

	h	m	s		
Longitude of Mokattam	2	5	6·320	East of Greenwich	Supplied by Sir G. Airy, from observations taken in connection with Transit of Venus in 1874.
Increase for Suez	0	5	6·917	„	
„ Aden	0	49	42·656	„	By the operations of this Survey; see the Annual Report for 1876-77.
„ Bombay	1	51	19·983	„	
„ Madras	0	29	43·540	„	
Longitude of Madras	5	20	59·416	„	

This value of the Longitude of the Madras Observatory is equivalent to 80° 14′ 51″; and as the originally adopted value, on which the longitudes of all the stations of this Survey are based, is 80° 17′ 21″—see page 135 of Volume II—the following precept may be accepted with considerable confidence :—

All the Longitudes require a constant correction, probably of −2′ 30″.

DEHRA DUN,
May, 1890.

G. STRAHAN, LIEUT.-COLONEL, R.E.,
Deputy Surveyor General,
In charge Trigonometrical Surveys.

ERRATA ET ADDENDA.

Page					
VI—*C.*	in line 3 from top	*for*	— 0″·011	*read*	+ 0″·011
VII—*C.*	„ lines 1 and 8 } from top	„	19 feet	„	17 feet
VIII—*C.*	„ „ 3, 10 and 15 } from top				
18—*C.*	at Station XV (Pil)	„	*circle reading* 61° 24′	„	161° 24′
XI—*D.*	in lines 5 and 6 from top	*omit*	(*lit.* rain-district) . . . . falls here.	*and read*	from Malai, a hill and Nadu, a country, meaning a hill-country.
54—*E.*	„ col. 1, line 2 from top	*for*	LXVI	*read*	XLVI
XII—*F.*	„ line 17 from bottom	„	No. 2	„	No. 1
11—*F.*	„ „ 25 „ top	„	10 feet	„	11 feet
13—*F.*	„ „ 7 „ „	„	rectangular	„	original circular
16*e*—*F.*	„ „ 6 „ bottom	„	8° 16′,	„	9° 16′,
144—*F.*	„ col. 14, line 1 of table	„	356	„	354
72—*G.*	„ „ 3, lines 2 and 4 of table	„	*Manjerabad	„	*Mánjarabad
76—*G.*	„ „ 14, line 2 of table	„	50·58	„	53·58

VOCABULARY OF CERTAIN NATIVE WORDS MADE USE OF IN THIS VOLUME.

Orthography employed.	Correct Orthography.	Meaning.
Brahman	Bráhman	The highest of the four castes of Hindus.
Chattram	Chattram	A rest-house.
Chauki	Chaukí	A small police station.
Daffadár	Dafadár	An officer whose rank corresponds to that of a sergeant.
Dargáh	Dargáh	A Muhammadan shrine.
Ghát	Ghát	A pass.
Idgah	Idgáh	A Muhammadan place of worship.
Jain	Jain	A sect of Hindus.
Kacha	Kachchá	Built of clay only; or of stone or unburnt brick, and clay.
Kacheri	Kachahri	Court house.
Kasba	Kasba	A small town.
Paka	Pakká	Built of stone, or brick, and mortar.
Pargana	Pargana	A sub-division of a district.
Pír	Pír	A saint, a holy man.
Rája	Rája	A king or ruler.
Sumaca	Samáka	A small fishing boat.
Taluk Táluka Taluka	Taälluk Taälluka	A sub-division of a district.
Thána	Thána	A small police sub-division.
Zamíndár	Zamíndár	A revenue farmer or holder of land immediately from Government.
Zamíndári Zamindári	Zamíndári	A landed estate.

W. H. COLE,

In charge of Computing Office.

May, 1890.

SOUTH KONKAN COAST SERIES.

SOUTH KONKAN COAST SERIES.

INTRODUCTION.

On the conclusion of the original triangulation of the Bombay Longitudinal Series and after the completion of the Bider Base-line, in the measurement of which the Bombay Party assisted, Lieutenant W. S. Jacob, of the Bombay Engineers, undertook the South Konkan Coast Series, which was accordingly commenced early in 1842. In the previous October Mr. Thomas Sanger, Sub-Assistant, Great Trigonometrical Survey, had been despatched to select and build the principal stations: he had been ordered to make the side Karanja–Singi the base of the new Series, but finding on arrival that it was not suitable, he took upon himself the responsiblity of starting from the side Karanja–Mándvi, a change that subsequently met with the Executive Officer's approval.

The portion of country between Bombay and Mangalore over which the triangulation was to pass was fairly well known, having some years previously been surveyed by Major Jervis, an Engineer Officer who had worked under the Bombay Government independently of the Surveyor General. Mr. Sanger's approximate series consisted of two lines of stations, one running near the coast and the other along the line of ghâts, and by the end of the field season it had been carried down to the parallel of 16°.

The Bider Base-line having been finished by February, Lieutenant Jacob proceeded to Mándvi to commence observing the final angles; on his arrival he found the station mark had been entirely destroyed and every stone of the platform had been removed and rolled down the hill. Fortunately the lower mark-stone had been set in a circular excavation in the rock of about 15 inches diameter, so that it was possible to restore the point to within 2 or 3 inches of the original position, and angles between several points being taken, it was proved that the error did not exceed that amount. Lieutenant Jacob considered a probable error of 3 inches as rejectaneous on a line of 40 miles, and determined therefore as far as the Konkan Series was concerned to treat the side Karanja–Mándvi as correct. Having been considerably delayed by this occurrence, Lieutenant Jacob did not commence his operations until the end of February: the haziness of the weather greatly obstructed his progress, and finding it hopeless to attempt to obtain good angles he brought the season's field-work to a close on the 21st of March at the station of Mahábaleshvar.

Lieutenant Jacob had constantly suffered from illness brought on by exposure in peculiarly pestilential tracts of country, and in the summer of 1842 his health entirely gave way: he proceeded to England on medical certificate and his connection with the Survey

Department terminated*: he was succeeded on December 14th, 1842, by Lieutenant Harry Rivers of the Bombay Engineers, an officer of great mathematical ability, who had been appointed to the Trigonometrical Survey only three months previously.

Season 1843-44.

PERSONNEL.

Lieut. H. Rivers, Bombay Engineers, 2nd Assist.
Mr. J. Fraser, 1st Class, Sub-Assistant.
„ T. Sanger, 1st „ „
„ J. DaCosta, 2nd „ „

During the field season of 1842-43 the party were employed on the North Konkan Series, now known as the Singi Meridional, and it was not till November, 1843, that work on the South Konkan Coast Series was resumed. The first station visited was Kanta (III), and by the 1st of January, 1844, the observations of the final angles had been carried down as far as Ghirya (IX) and Valvan (X). Mr. DaCosta was then sent to Surat to select the stations for the North Konkan Series, and Mr. Sanger proceeded south in advance of the main party to complete the approximate work of the South Konkan Coast Series to Goa. The weather continued remarkably favourable, and no difficulties or delays occurred to hinder the observations, so that by the 15th of February Lieutenant Rivers had practically completed the field-work of the Series including the observation of astronomical azimuths at Chaukola and Kumbhári. The southern stations were visited in the following order:—Chaukola, Salili, Kumbhári, Pil, Agoada, Parule; and the party embarked at the last named for Bombay the day after closing work. Apparently as an after-thought, astronomical observations for azimuth were taken in October, 1844, at Mirya.

The instrument employed on the South Konkan Coast Series was the same 15-inch Theodolite by Dollond†, that was used in the observations of the Bombay Longitudinal Series. It was constructed on a design and under the direction of Captain Kater, and possessed, like all Dollond's instruments, a very fine telescope: but the horizontal circle was one of the first that had ever been engine-divided, and proved of an inferior order, giving angles differing to the extent of 13″ on different parts of the limb. The microscopes too were not adjustable for "run", and corrections varying with the temperature had therefore to be applied to the recorded readings of the angles.

Weak as the instrument undoubtedly was, its defects were not nearly sufficient to account for the want of harmony visible in the results of the observations: the condemnation of this Series by Sir Andrew Waugh to the third rank of geodetical undertakings, if indeed it deserves to be classed as such at all, must be considered to be entirely due to the fewness of the zero changes made during the measurement of the angles. The method of changing zero pursued on this Series gave readings at every 20° of the limb instead of at every 10° according to the recognised system in force in the G. T. Survey, a deviation from established practice which resulted in the triangular error being on an average 4″ and amounting in one instance to no less than 13″. The greatest triangular error in the Bombay Longitudinal Series, executed with the same instrument, was 3″ and the average 1″.

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* Lieutenant Jacob afterwards became Government Astronomer at Madras.

† For a full description of the instrument and the work performed by it, see Appendix No. 2 of Volume II of the *Account of the Operations, &c.*

The heights of the Principal Stations were deduced from those of Mándvi and Karanja as determined by the Bombay Longitudinal Series; the observations of vertical angles were however chiefly confined to the flanks of the series, and were seldom taken on the diagonal rays connecting the two flanks: the usual check obtained by having two independent determinations for each station was therefore altogether wanting. This peculiarity arose not from any mistake or oversight but because the Officer in charge of the operations considered that results derived from cross rays would be valueless since the laws of refraction must be different on the summit of the Gháts and along the sea-coast. Sir Andrew Waugh has pointed out, that, if a difference in the laws of refraction *does* exist, the original determination of the height of the first station on the Gháts must itself have been affected thereby, and the discrepancy so introduced must have remained constant throughout the eastern flank; he has moreover put his opinion on record that the heights of the stations on the Gháts would have been more accurately determined by frequent reference to the sea-level and repeated cross observations. As before stated the vertical observations emanated from Mándvi and Karanja and proceeded in two distinct lines along each flank. These lines afterwards met at the station of Mirya with the following discrepant results:—

Height of Mirya deduced from Karanja by observations along the Coast Line	490·0	feet
„ „ Mándvi „ „ Gháts	452·2	„
Difference	— 37·8	

The height of Mirya was also determined by direct reference to the sea-level and found to be 464·4 feet. The error generated through five stations along the Gháts was therefore —12·2 feet, and that generated through four stations along the coast +25·6 feet. This result, which shews the coast error to be twice as large as the ghát error, clearly exposes the fallacy of avoiding cross observations. From Mirya the observations again proceeded in separate lines along the flanks as far as Valvan, where there were two deductions differing by 3·4 feet, and further south at Agoada and Salili there were also double deductions differing 10·8 feet and 12·2 feet respectively.

In 1866 and 1867 the southern extremity of the South Konkan Coast Series was connected with the Mangalore Meridional Series by Captain (now Colonel) C. T. Haig, R.E., and Lieutenant H. Trotter, R.E.: the connecting series followed the parallel of 15° 30′ and consisted of a small chain of six single triangles; it was known at the time as the Goa Longitudinal Series, but this name is no longer recognised and the six small triangles have been incorporated for purposes of reduction and publication in the South Konkan Coast Series: as however the angles were observed in the same seasons and by the same officers and party as those of the neighbouring portion of the Mangalore Meridional Series, it has been considered advisable for the sake of continuity in description to give the historical account of the work in the Introduction to the latter to which therefore readers are referred.

The triangulation of the South Konkan Coast Series has been included in the simultaneous reduction of the Southern Trigon: the errors actually dispersed on this Series between the origin Karanja–Mándvi and the terminus Samshergad–Yalúr (the side of junction between the Mangalore Meridional Series and the old Goa Longitudinal Series) are:—

In	Latitude	... ...	$-$ 0″·011
„	Longitude	... ...	$+$ 0·218
„	Azimuth	... ...	$-$ 1·469
„	Side { Logarithm	... ...	$+$ 0·000,01478,
	giving a ratio of about $2\frac{1}{8}$ inches per mile.		

Owing to the large circuit errors in the values of Lieutenant Rivers' heights, the omission of the cross rays in his observations, and the adverse criticism passed on the work by Sir Andrew Waugh, it was decided in 1885 when the compilation of this volume was being taken in hand to revise all the vertical angles of the Series. The revision which was carried out by Messrs. Belcham and Prunty, Assistants in the Tidal and Levelling Party, in the field season of 1885-86, had for its origin the height of Karanja, which was derived directly by reciprocal vertical observations to and from Trombay, a station whose height had been previously determined by Spirit-levelling: on account of the uncertain refraction on rays between the top of the ghâts and the sea-coast, the reciprocal vertical angles were observed on all such rays *simultaneously* from the upper and lower stations—a precaution ordered by Colonel C. T. Haig, R.E., the Deputy Surveyor General, with a view to minimizing the errors caused by refraction, of which Lieutenant Rivers forty years before had been so afraid; a comparison between the new heights and the old exhibited discrepancies with a range of 43 feet, which in Colonel Haig's words "amply justified the revision"; the resulting heights were accepted as "exceptionally accurate" and were reported as "probably true to within two or three feet." As, however, in the next field season (1886-87), a line of spirit-levelling had to be executed to connect the new Tidal Station of Mormugáo with that at Kárwár, and Pil, the southernmost station of the South Konkan Coast Series, was in the immediate vicinity, Colonel Haig decided to have a short line of spirit-levels taken to it for the purpose of determining "any small residual error that there might be in the trigonometrical levelling": he also directed Agoada which is only 5 miles north of Mormugáo Tidal Station to be *directly* connected with the latter.* By these two connections, contrary to the Deputy Surveyor

* The manner in which this connection was effected is described by the Officer in charge of the Tidal and Levelling Party as follows:— 'Before going to Agoada, Mr. Corkery and Narsing Das set their watches by the tide gauge clock at Mormugáo tidal observatory in order 'that their observations at Agoada and the observatory clerk's at Mormugáo might be made simultaneously. Agoada Station was then 'connected by double levelling with a bench-mark laid down at Agoada Fort Jetty, in a convenient position for observing the difference 'between its height and that of the tide as shown upon a levelling staff set up in the water. One complete observation consisted in 'reading the back and forward staff and the height of the water on the latter, and noting the time. Observations were taken at intervals 'of 5 minutes, beginning about one hour before high-water and continuing for an equal time after high-water, and the duration of actual 'high-water was sufficient to enable a couple of observations to be taken then, so that a whole set comprised about 26 observations. 'A similar set of observations was taken before, during and after low-water. Observations were not taken at night. * * * While these 'observations were being taken at Agoada the observatory clerk was taking simultaneous observations at the Mormugáo tidal observatory. '* * * They were taken on the 22nd, 23rd and 24th May. I wished to obtain the exact times of high and low-water at Agoada 'to compare with the corresponding times at Mormugáo; but the sea was not smooth enough to enable this to be done in the available 'time'. After interpolating between the data furnished by the Kárwár and Bombay tidal observations, it was found that 'no corrections 'for minute differences of time or for difference of range were required. One set of observations at Agoada combined with the synchronous set at Mormugáo gave one value of the height of the Agoada bench-mark, above the zero of the tide-gauge at Mormugáo. Six 'such values were obtained—three at high-water and three at low-water—the mean of which gave the final height of the bench-mark 'above the zero of the gauge. The difference of level between the zero of the gauge and mean sea-level * * * was a known quantity 'by means of which the heights above mean sea-level of the bench-mark and Agoada Station were finally deduced. * * * The 'height of Agoada Station now obtained is probably accurate to 0·03 of a foot'.

General's sanguine expectations an accumulated error of 19 feet was shown up in the trigonometrical heights at both places. It must be concluded that reciprocal observations though made simultaneously are not equally affected by refraction; if the refraction at both stations is *the same,* the subtended angle, which is half the difference of a pair of reciprocal vertical angles, should remain constant, and not be affected by variations in the *amount* of refraction; on this Series however it was found in many instances to vary between limits far exceeding those of errors of observation.

Besides disclosing an error of 19 feet in what were considered as "exceptionally accurate" trigonometrical heights, the line of levels brought to light another peculiarity: it was that the spirit-levelled values of Agoada and Pil agreed exactly with the old results, discarded and much abused, of Lieutenant Rivers. This agreement gave rise to a discussion, as to whether the rejection of Rivers' heights was justifiable after all: there were but two circuits of vertical observations able to be formed in the old work throughout the Series: one closed at Mirya with an error of 38 feet, the other at Agoada with an error of 11: in the face of such discrepancies the correct results at Agoada and Pil could not be regarded as anything but happy coincidences due to cancelment of errors, and it was finally decided to throw out Rivers' observations altogether as unworthy of combination with those of the revision.

The question then arose as to whether Lieutenant Rivers' value of the height of Mirya, which it will be remembered he derived directly from the sea-level, should be retained as an absolute height and used as a means for dispersing residual errors of trigonometrical work or whether it should be rejected also. By reference to the old angle books it was found that Rivers had determined the height of Mirya above mean sea-level as follows:—He first placed an upright pole in the water, and on three successive days marked upon it the level of the sea at high and low tide: half-way between the upper and lower marks he drew a horizontal line, which represented the mean sea level, and which he found to be 3·2 feet below the highest point that the tide rose to. He then erected a second pole on a firm rock, that was just covered at high water, and proceeded to his trigonometrical station of Mirya, a little over half-a-mile off, from which he observed the angles of depression to the top and bottom of the pole. From these two angles and the measured length of the pole he computed the height of Mirya above *high water* and then referred it to mean sea level by increasing it 3·2 feet. His observations extended over a week, three different poles, a 7-foot, a 13-foot and a 19-foot being all employed. His angles of depression were never repeated more than twice (*i.e.* once on each face of the instrument), and on some days they were only observed once on but one face. The results were very discrepant, more than half were rejected on the spot for apparently no other reason than discordance, and those retained depended on three days' observations only, two of which differed by 7 feet. Sir Andrew Waugh writes:—"The average "height of the pole was about 15 feet: the height of Mirya Station is 464 feet. Consequently "the unknown quantity sought is 31 times greater than the known base it is derived from: "from this circumstance it appears that the principle employed in determining the height of "Mirya has been extended beyond its legitimate limits." Whilst passing this criticism on Lieutenant Rivers' *method,* the Surveyor General gave it as his final opinion that on the whole the determination of the height of Mirya might be considered true within two feet.

Now the vertical observations of 1885-86 brought out the height of Mirya as 464 feet, the identical value obtained by Rivers. If therefore Rivers' results were to be retained, the residual error of 19 feet mentioned above in the modern trigonometrical work would have to be distributed between Mirya and Agoada; while if Rivers' results were to be discarded, the same residual would have to be distributed between Karanja and Agoada, and in this case Rivers' height would be shown to be 8½ feet in error. The number of triangles in the Series between Karanja and Mirya was eight, and between Mirya and Agoada five: one triangle only had a closing vertical error as large as 4 feet, whilst the average discrepancy per circuit was 1⅓ feet: the sum of all the circuit errors between Mirya and Agoada amounted to only 11 feet. It was considered astonishing that a residual error of 19 feet should have appeared at Agoada at all, but that it was generated wholly between Mirya and Agoada, is in the face of the small circuit discrepancies, incredible. It was therefore decided in spite of the accordance of the old and modern results, and notwithstanding Sir Andrew Waugh's opinion that Rivers' height of Mirya was correct to within 2 feet, to reject Rivers' observations *in toto*. This has now been done: the residual error of 19 feet has been dispersed between Karanja and Agoada, and the height of Mirya has been determined as 473 feet. It is probable even now, in spite of the additional precautions taken in measuring the vertical angles, that on account of peculiarities in refraction the heights of the South Konkan Coast Series are not so reliable as ordinary modern trigonometrical heights: it would in fact be no matter for surprise, if an error of 5 feet was discovered hereafter in the height of any one of the stations.

Secondary Work.

The Secondary work of Lieutenants Jacob and Rivers was scanty, only about 80 points of this class being fixed in the entire length—nearly 250 miles—of the Series: the principal places whose positions were determined were:—The towns of Poona and Ratnagíri, and the forts of Ráigad, Partábgad, Matgad and Bhaura; the Agoada light-house and the more important headlands likely to be of use in navigation were now accurately fixed for the first time. In 1864, Lieutenant-Colonel J. T. Walker, the Superintendent of the Great Trigonometrical Survey, ordered Captain C. T. Haig, who was then employed on the triangulation of the Mangalore Meridional Series, to detach, as opportunities offered, one of his assistants to the South Konkan and to allot to him the work of laying down all points of importance along the coast. Accordingly, Mr. Anding with a small party was sent to Bombay in January, 1865; and, working at intervals, he was able in that and the next field season to add about 35 additional points along the length of the coast-line between the extremities of the South Konkan Series.

July, 1888.

S. G. BURRARD,

In charge of Computing Office.

SOUTH KONKAN COAST SERIES.

PRINCIPAL TRIANGULATION. ALPHABETICAL LIST OF STATIONS.

Adhúr	V.
Agoada	XIII.
Bailúr	XX.
Bori	XVII.
Chaukola	XII.
Darsinga	XIX.
Ghirya	IX.
Jarma	XVIII.
Kanta	III.
Karanja (Of the Bombay Longitudinal Series).	XXXIV.
Kumbhári	XVI.
Kumbhárli	VI.
Mahábaleshvar	IV.
Mándvi (Of the Bombay Longitudinal Series).	XXXI.
Manoli	VIII.
Mirya	VII.
Parule	XI.
Pil	XV.
Salili	XIV.
Samshergad (Of the Mangalore Meridional Series).	XXIII.
Titvi	I.
Torna	II.
Valvan	X.
Yalúr (Of the Mangalore Meridional Series).	XXII.

PRINCIPAL TRIANGULATION. NUMERICAL LIST OF STATIONS.

XXXI (Of the Bombay Longitudinal Series).	Mándvi.
XXXIV (Of the Bombay Longitudinal Series).	Karanja.
I	Titvi.
II	Torna.
III	Kanta.
IV	Mahábaleshvar.
V	Adhúr.
VI	Kumbhárli.
VII	Mirya.
VIII	Manoli.
IX	Ghirya.
X	Valvan.
XI	Parule.
XII	Chaukola.
XIII	Agoada.
XIV	Salili.
XV	Pil.
XVI	Kumbhári.
XVII	Bori.
XVIII	Jarma.
XIX	Darsinga.
XX	Bailúr.
XXII (Of the Mangalore Meridional Series).	Yalúr.
XXIII (Of the Mangalore Meridional Series).	Samshergad.

SOUTH KONKAN COAST SERIES.

DESCRIPTION OF PRINCIPAL STATIONS.

All the Principal Stations hereafter described, with the exception of that on the bastion of Agoada fort, are situated on hills. Stations numbered XXXI, and XXXIV (of the Bombay Longitudinal Series), II, III, XIV, XVII, XVIII, XX, and XXII and XXIII (of the Mangalore Meridional Series), each consists of a circular and isolated pillar of masonry, either solid or perforated, from 2 to 3½ feet in diameter, and from 3½ to 5 feet in height excepting at two stations at which the pillars are sunk in the ground and have their surfaces flush with the ground level. Around each pillar and level with its upper surface, a platform of stones and earth 10 to 14 feet square was built for the accommodation of the observatory tent. Stations numbered I and XIX are denoted simply by circle and dot cut on the rock *in sitú*. The remaining stations have platforms of stones and earth, some circular and 10 to 13 feet in diameter, and some square 8 to 14 feet in side, and varying in height from 1 to 5½ feet. In the centre and upper surface of the pillar or platform is embedded a stone on which is engraved a mark (circle and dot) in the normal of one or more similar marks below, the lowermost mark being in some instances cut on the rock *in sitú*.

At all the stations the upper marks have been protected by small pillars of masonry in the form of a frustum of a pyramid, 28 inches square at base, 20 inches at top and 3½ feet in height, excepting at Agoada station where the pillar is 3 feet in diameter and 5 feet in height. These protecting pillars carry sufficiently accurate marks on their upper surfaces for Topographical and Revenue Survey purposes, as shewn at page 74 of Volume II of the *Account of the Operations &c.*

The following descriptions have been compiled from those given by the Officers who executed the Series, and by the Officer in charge Tidal and Levelling Operations, under whose superintendence the vertical angles of the Series executed between the years 1842-44, were revised, supplemented as regards adjacent villages from the Topographical Survey Maps of the country traversed, and corrected, so far as the local sub-divisions in which the several stations are situated, from the latest Annual Reports furnished by the District Officers to whose charge the stations were committed.

The orthography is based on the official lists published under the orders of the Government of India, except that the long *e* is unaccented as in all previous volumes of this series, and the short *e* is shewn thus, *ĕ*; the same remarks apply to *o*. Final vowels and those in well-known terminals are unaccented. When the popular spelling of a name has been accepted by Government, its correct transliteration is given in parenthesis where the name occurs for the first time.

XXXI. (*Of the Bombay Longitudinal Series*). Mándvi Hill Station, lat. 18° 38′, long. 73° 35′—observed at in 1839, 1841 and 1842—is on a ridge of the Western Gháts and occupies the peak locally known as Mándvi: it is 1½ miles W. of the village of Vaula, whence there is a very fair path to the station, Tikona hill fort 1¾ miles W. is connected with it by a remarkable ridge about a mile in length along which there is a footpath. The station is at the N. end of the summit of the hill which rises precipitously from all sides to a height of about 500 feet above the level of the high ridges of the table-land. The hill is composed generally of hard vesicular basalt; the lower part is of amygdaloid. The station is in the lands of the village of Tikona, táluka Pován Mával, Bhor State.

The station of 1839 consisted of a platform having a mark-stone in its upper surface and another inserted in a circular hole, 15 inches in diameter, excavated in the rock below. No change appears to have been made in 1841. When visited in 1842 in connection with the operations of the South Konkan Coast Series, the platform had been entirely destroyed and the lower mark removed: a new station was built consisting of a platform enclosing a solid, circular and isolated pillar of masonry, having two marks, one engraved on the rock *in sitú* in the excavation mentioned above and the other 2 feet above it on a stone embedded in the upper surface of the pillar which is flush with the ground. The upper part of the pillar has three stones for the support of the theodolite stand. From observations taken both at and to this station, its position was found to be identical with that of 1839. In 1881 the mark in the upper surface of the pillar, which is 5 inches lower than the surrounding platform, was found in position but the pillar was somewhat damaged. In 1885 the station was found to consist of a roughly constructed pillar of masonry 2½ feet in diameter and 2 feet deep surrounded by an annulus and the upper mark was firmly embedded in position. The directions and distances of the circumjacent villages are:—Malaundi N.W. by N., mile 1; Kásig S.W. by W., miles 1½; Kolván S., miles 3½; and Andhali S.E. by E., miles 1¾. *Note.*—In 1842 another mark surrounded by a smaller circle was also cut on the rock *in sitú*: this mark is 3·35 inches to the S.E. and a little above the lower mark of the present station.

XXXIV. (*Of the Bombay Longitudinal Series*). Karanja Hill Station, lat. 18° 51′, long. 72° 59′—observed at in 1839 and 1842—is situated on the highest part of the southern and higher of two hills on the island of Uran about 6 miles S.E. of Bombay. The hill is locally called Dronagiri, and has the cart road from the town of Uran to Karanja skirting its eastern base. There are two very good reservoirs of water on the hill, one at ¼ of a mile N.W. of the station and the other ¾ of a mile in the same direction and contiguous to a dilapidated chapel. The station is in the lands of the village of Chanja, táluka Panvel, district Kolába.

The station as built in 1839 is described as "marked by a circle and centre on a square pile of stones." No change appears to have been made in 1842. It was visited in 1866 in connection with the Bombay Island Triangulation but no statement is forthcoming to show that any change was then made. In 1881 Mr. W. G. Beverley found the station to consist of a solid, circular pillar of masonry 3 feet in diameter enclosed in a platform of stones about 10 feet square and 4 feet high. The pillar was much damaged and a flag-staff of the Harbour Surveying Department was found inserted in it, consequently the mark-stone was not in its place but on the side of the platform: the mark-stone was firmly refixed in the centre and upper surface of the pillar. When again visited in 1885, the station was in good preservation. The directions and distances of the circumjacent villages are:—Uran N., miles 1½; Karanja S.E., mile 1; Chanja N.E. by E., mile 1; and Nagaon N.W., miles 1½.

I. Titvi Hill Station, lat. 18° 23′, long. 73° 4′—observed at in 1842—is situated on the highest part of a range of hills running nearly parallel to the coast, and at a distance of about 8 miles from it. The large village of Nándgaon which is ¼ mile from the coast and on the main road from Borlai to Murúd lies 6 miles W. of the station and that of Murúd 4¾ miles S.W. The station is in the lands of the village of Titvi, táluka Roha, district Kolába.

The station is denoted by a circle and dot engraved on the surface of a large laterite rock surmounted by a cairn of stones. When visited in 1885-86 it was in good preservation. The azimuths and distances of the circumjacent villages are:—Dhangar (hamlet) 222°, mile ¼; Titvi 176°, mile 1; Khandár 186°, miles 2; Sasoli 178°, miles 2¾; and Chenera 194°, miles 2½.

II. Torna Hill Station, lat. 18° 16′, long. 73° 40′—observed at in 1842—is situated on the highest part of the hill fort of Torna or Prichandgad, and near the western brow of the hill: it is 89 yards E. of the western or Konkan gate of the fort and 60 yards W. of Mengais' temple and sadar (court) house. The ascent from the village of Yela at the E. foot of the hill is good till the fortifications are reached, after which it becomes steep and dangerous, the summit being reached by steps cut in the rock. It is in the lands of the village of Yela, táluka Prichandgad, Bhor State, Sátára Agency.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry, 3 feet in diameter and 2 feet deep, having its surface flush with the ground level which contains two marks, one in its upper surface and the other 2·08 feet below it in the foundation. The directions and distances of the circumjacent villages are:—Vagdari N.N.W., miles 1¼; Yela Buzurg N.E. by N., miles 1¾; Rájgad (fort) E.S.E., miles 4¼; Bársi hamlet S.S.W., miles 1½; and Phanas hamlet W.N.W., mile 1.

III. Kanta Hill Station, lat. 17° 58′, long. 73° 8′—observed at in 1843—is situated on the centre and highest of the three conspicuous peaks lying in a straight line and about ½ a mile apart. These peaks rise above the table-land on the S. side of the Sávitri river. The large village of Bánkot is on the slope of the table-land about 2¾ miles N.W. The station is in the lands of the village of Kanta, táluka Dápoli, district Ratnágiri.

The station of 1843 was marked by a circle and dot cut on the rock. When visited in 1885-86, it was found to consist of a kacha circular pillar 2 feet in diameter and 3½ feet in height, surrounded by a platform of loose stones. As there was no mark-stone in the upper surface of the pillar it was removed and the mark of 1843 was found engraved on the rock *in sitú*. On completion of the observations a pillar of paka masonry of the same dimensions as the kacha pillar was built, carrying a mark-stone in its upper surface, in the normal of the mark on the rock. The azimuths and distances of the following villages and objects are:—Ambavli 348°, miles 1¼; Panháli 280°, miles 1¾; Gudagad 245°, miles 1¼; Shipola 198°, mile 1; Western peak 124° 17′, mile ½; and Eastern peak 301° 43′, mile ¾.

IV. Mahábaleshvar or Malcolmpeth Hill Station, lat. 17° 55′, long. 73° 43′—observed at in 1842—is situated near the S.W. end of the rocky ridge locally known as Sindola, and is the highest point in the sanitarium of Mahábaleshvar. It is immediately above the house called "The Four Oaks", from which a path leads to the Beckwith Monument and Christ's Church distant ¾ of a mile W. by N. The station is in táluka Jávli, district Sátára.

The station consists of a circular platform of stones 13 feet in diameter having a mark-stone in its upper surface and another 4·54 feet below it at the ground level. Around the upper mark-stone three large stones are fixed for the theodolite stand. When visited in 1885-86 the station was in good preservation.

V. Adhúr Hill Station, lat. 17° 24′, long. 73° 13′—observed at in 1843—is situated on a very conspicuous hill, the foot of which is washed by the sea on its S., N. and W. sides which are very precipitous: it is 3¼ miles S.W. by W. of the village of Pálshet on the high road from Bombay to Bandar Rohila. The ascent from the E. is tolerably easy. The station is 60 feet N. of the southern extremity of the hill and 79 feet from the S.E. corner, 81·75 feet from the S.W. corner and 86 feet from the centre (top) of Durga Devi temple which is 17 feet square and 15 feet high. It is in the lands of the village of Adhúr, táluka Chiplún, district Ratnágiri.

The station consists of a platform of stones 12 by 13 feet and 1 foot high, having a mark-stone in its upper surface and another 1·01 feet below it. When visited in 1885-86 the station was in good preservation. The directions and distances of the circumjacent villages are:—Adhúr E. by N., miles 2; Budhal N.E. by N., mile ½; Karul E.S.E., miles 2; and Bori (Customs Office) S.E., miles 1⅜.

VI. Kumbhárli Hill Station, lat. 17° 25′, long. 73° 43′—observed at in 1843—is situated on a flat-topped hill called Torna, about 30 feet from its western edge which is precipitous: it is 1½ miles of the Engineer's Bungalow near milestone No. 38 on the high road from Karád to Chiplún and immediately above and on the N. side of the Police Chauki at the head of the Kumbhárli Ghát. The station is best approached from the village of Helvak, *viá* Torna on the table-land. It is in the lands of the village of Torna, táluka Pátan, district Sátára.

The station described in 1843 is as follows:—"The station is marked in the rock." When visited in 1885-86 it was found to consist of a rough stone platform 10 feet in diameter with a mark-stone 8 inches square firmly fixed in the centre and flush with the upper surface of the platform which is 2½ feet above the level of the hill. The directions and distances of the circumjacent villages are:—Torna E.S.E., miles 1⅜; Bopoli S.E. by S., miles 1⅞; Dhankal S., miles 2; Kembsa S.W. by S., miles 2; and Pophli N.W. by W., miles 3½.

VII. Mirya Hill Station, lat. 17° 2′, long. 73° 18′—observed at in 1843 and 1844—is situated on the summit of a very conspicuous hill locally known as Mirya Dongar, and is surrounded on three sides by the sea: it is about 2 miles W. of Shirgaon village and 3 miles N.N.W. of the Ratnágiri Light-house. The station is in the lands of the village of Vada Mirya, táluka and district Ratnágiri.

The station was originally denoted by the usual circle and dot engraved on the top of a large rock around which a platform was built. When visited in 1885-86, the mark on the rock was found intact. The azimuths and approximate distances of the following places are:—Mirya No. 1 230°, mile 1; Mirya No. 2 285°, mile ¾; Mirya Dharmshála 216°, miles 1¼; and Ratnágiri Collector's Office 320°, miles 3.

VIII. Manoli Hill Station, lat. 16° 55′, long. 73° 51′—observed at in 1843—is situated on the W. edge of a small table-land at the W. end of Manoli hill: it is 18 feet E. of a precipice and somewhat lower than the highest point of the range which is extensive and runs E. and W. The village of Ámba, near the head of Ámbághát on the road from Kolhápur to Ratnágiri, lies 4 miles N. of the station. The ascent, which is steep in two or three parts and through dense forest, is from the village of Manoli. It is in the lands of the village of Manoli, táluka Vishálgad, Kolhápur State.

The station, as described in 1843, consisted of a platform having a mark-stone in its upper surface and another mark 1·54 feet below it engraved on the rock. When visited in 1885-86 it was found to consist of a rough but substantial stone platform 13 feet in diameter and 3½ feet above the ground, with a mark-stone about 7 inches square set in the centre and on a level with the surface of the platform. The approximate directions and distances of the following villages are:—Manoli N., miles 2; and Malkapur E., miles 9.

IX. Ghirya Hill Station, lat. 16° 30′, long. 73° 22′—observed at in 1843—is situated on a low flat-topped hill, locally known as Kurutiam, rising perpendicularly above the coast line, about 4 miles S. of the large village of Vijaydurg. It is in the lands of the village of Ghirya, táluka Devgad, district Ratnágiri.

The station in 1843 was marked by the usual circle and dot engraved on the rock. When visited in 1885-86 it was found to consist of a stone masonry platform 7⅞ feet square and 1·83 feet high, in the centre of which stood a staff in a circular hole 19 inches deep and 12 inches in diameter, cut partly into the rock. On removing the platform three flat surfaces (intended for the theodolite stand) were found cut around the circular hole the centre of which agreed with the centre of the circle circumscribed around the equilateral triangle formed by joining the centres of the three flat surfaces above mentioned. A mark-stone was fixed in the centre of this hole flush with the surface of the rock. From observations to the surrounding stations it became evident that the mark occupied the same position with that engraved on the rock in 1843 and which had been destroyed in cutting the hole for the staff. The azimuths and approximate distances of the surrounding places are:—Kumár Vádi 270°, mile ½; Chaundasir temple 240°, mile ¾; Kothavadi temple 300°, miles 1½; and Puruli hamlet 324°, miles 3½.

X. Valvan Hill Station, lat. 16° 25′, long. 73° 54′—observed at in 1843—is situated on the western knoll of an extensive semicircular range of hills, called Mursumbi Dongar, about 3 miles N. of the village of Valvan and 4 miles N. of Dajipur, a village with a travellers' bungalow near the head of Phondághát, on the high road from Kolhápur to Devgad. The knoll on which the station is gradually slopes westward for about

300 yards and then ends precipitously, overlooking the table-land on which lies a small hamlet belonging to Valvan. The station is approached from Valvan by a gradually ascending path up to the foot of the knoll after which the ascent is rather steep. It is in the lands of the village of Valvan, estate Bávda, Kolhápur State.

The station built in 1843 consisted of a platform having a mark-stone in its upper surface and another mark 9½ inches below cut on a large piece of rock around which the platform was built. When visited in 1885-86 it consisted of a dot and circle 6 inches in diameter deeply engraved on a rock projecting about 4½ feet above the surrounding ground, around which was a 10-foot square platform of rough stone-work, with steps on the west side.

XI. Parule Hill Station, lat. 15° 58′, long. 73° 33′—observed at in 1843 and 1844—is situated on the highest point and at the N.E. end of a flat-topped, conspicuous hill, rising immediately above the coast line, about 6¾ miles S.S.E. of the town of Málvan. It is in the lands of the village of Parule, táluka Vengurla, district Ratnágiri.

The station originally consisted of a platform which contained two mark-stones, one in its upper surface and the other 5·83 feet below it. When visited in 1885-86 it was found to be a platform of stones 9 feet square and 5¾ feet high; the upper mark-stone had been removed, but the lower was intact, over which the usual rectangular pillar of masonry has been built. The azimuths and approximate distances of the circumjacent places are:—Asba hamlet 210°, miles 1½; Parule 252°, miles 1½; Pat 276°, miles 4; and Málvan Custom house 151°, miles 7.

XII. Chaukola Hill Station, lat. 15° 56′, long. 74° 2′—observed at in 1843—is situated on about the centre of a small flat-topped hill, the most westerly point of the group of hills forming the Chaukola plateau: it is about 2½ miles S. by W. of the Amboli Sanitarium at the top of the Ambolighát, and ⅜ of a mile S.E. of the 46th mile-stone on the road from Belgaum to Vengurla. There is a much higher point about ½ a mile N.E., but this did not suit the ray to Valvan station. It is in the lands of the village of Chaukola, Sávant-vádi State.

The station consists of a platform 12 feet square having a mark-stone in its upper surface and another mark 2·13 feet below it cut in the rock. When visited in 1885-86, the station was found in good preservation. The directions and distances of the circumjacent places are:—Chaukola S.E. by E., miles 3½; Phansauda S.S.W., miles 1¾; and Nenanvádi S.E. by E., miles 1½.

XIII. Agoada Station, lat. 15° 30′, long. 73° 49′—observed at in 1844 and 1867—is situated in the centre of the N.E. bastion of the upper fort of Agoada, 273 feet 4 inches from the Light-house, the azimuth of which is 346° 42′ 30″. A few miles lower down is the town of Panjim or New Goa, now (1888) the chief town of the Portuguese territory.

The station, as built in 1843, was marked by a circle and dot on brass let into the stone at the surface of a pillar and a mark-stone embedded 1·77 feet below it. When visited in 1867 the station pillar was found intact: over this a circular protecting pillar of masonry, 3 feet in diameter and 5 feet in height, was built, carrying a mark-stone in its upper surface. When again visited in 1885-86, the protecting pillar was found in good preservation.

XIV. Salili Hill Station, lat. 15° 35′, long. 74° 7′—observed at in 1844 and 1867—is situated on the highest point of the hill isolated from the line of the Western Gháts, and runs E. and W. The sister hill called Vágiri lies to the N.W. with a very conspicuous clump of trees on its summit. The ascent which is steep and over rugged ground is from the village of Salili at the S. foot of the hill. It is in the lands of the village of Salili, táluka Sanquelim (Sánkuli), Portuguese territory.

The station is said to be the same as that of Captain Garling's triangulation, but no description was given of it when visited in 1844. When visited in 1867 a circular, perforated and isolated pillar of masonry 32 inches in diameter and 4·96 feet in height was built carrying a mark-stone in its upper surface, in the normal of the mark of 1844. A platform 14 feet square was built, through which and the central pillar an aperture gives access to the lower mark. When again visited in 1885-86, the station was found in good preservation and to consist of a platform 14 feet square, and about 3 feet above the surface of the hill, enclosing an isolated pillar of masonry 32 inches in diameter, with a mark-stone let in flush with the upper surface of the pillar. The approximate directions and distances of the following places are:—Salili S., miles 1½; and Sanquelim (town) W. by S., miles 5.

XV. Pil Hill Station, lat. 15° 6′, long. 74° 3′—observed at in 1844—is situated on the highest point of the hill locally known as Peril. There are two good springs of water on the hill lying N.W. and S.E. respectively, both within a quarter of a mile of the station. It is in the lands of the village of Mor Pil, pargana Bálli, district Goa, Portuguese territory.

The station is marked in the usual manner on two stones, the difference of height between them being 1·71 feet. When visited in 1886, the station was found slightly damaged but the upper mark-stone was intact. The azimuths and approximate distances of the following places are:—Baitul 128°, miles 4½; Mor Pil 148°, mile 1; Cape Ramas 70°, miles 4; and Kopi 59°, miles 2.

XVI. Kumbhári Hill Station, lat. 15° 9′, long. 74° 20′—observed at in 1844—is situated on a peak of the Western Gháts overlooking the Konkan, about 3 and 6 miles S.E. of the villages of Kumbhári, and Bhattia respectively, and 14 miles S.E. of the town of Sanguem (Sangi). The summit of the hill is pointed and very precipitous on the N. and W. sides, and has just sufficient space for the station: on the E. and S. the hill slopes down gradually. It is on the boundary of Kagloli and Kumbhári villages, the former in the Supa táluka, district Kánara, and the latter in the Sanguem táluka, Portuguese territory.

The station consists of a platform 12 feet square and 2½ feet high which contains two mark-stones, one in its upper surface and the other 1·25 feet below it. Around the upper mark three large stones are fixed for the theodolite stand.

XVII. Bori Hill Station, lat. 15° 21′, long. 74° 5′—observed at in 1867—is situated on a high hill about 5 miles S.S.E. of Panda in Portuguese territory. The best route to the station is by the river Rachol which should be ascended as far as the village of Bori, whence there is a stiff climb of two hours over a very rough road. It is probably within about 4 feet of the station of "Boree" of Colonel Lambton's triangulation. The station is in Portuguese territory.

The station consists of a platform enclosing a circular, perforated and isolated pillar of masonry 4 feet high, which contains two mark-stones, one in its upper surface and the other below it: an aperture gives access to the lower mark.

XVIII. Jarma Hill Station, lat. 15° 36′, long. 74° 9′—observed at in 1866—is situated on the eastern of two remarkable hills which rise almost from sea level to a height of about 2,000 feet and are detached from the main line of the Western Ghâts: the station is on the centre and highest of three summits, the northern having a grove of trees forming quite a landmark, about 6½ miles E. by N. of the town of Sanquelim on the main road from Bicholim to Khánápur, and 4 miles S.W. by S. of Chorlen Ghát. The station is in the lands of the village of Jarma, táluka Sanquelim, Portuguese territory.

The station consists of a platform enclosing a circular, isolated and perforated pillar of masonry which contains two mark-stones, one in its upper surface and the other below it: an aperture gives access to the lower mark.

XIX. Darsinga Hill Station, lat. 15° 31′, long. 74° 19′—observed at in 1866—is situated on the extreme western edge of the precipitous crest of a high and commanding plateau, somewhat detached from the main line of the Western Ghâts. The stone marking the trijunction of the districts of Kánara, Belgaum and Goa is about 11 chains S. It is about 3 miles N. of the small village of Paldi, and 2⅓ miles S.W. of Mundil. The only easy ascent is from the village of Paldi at the S. side of the hill. The station is in the lands of the village of Paldi, táluka Supa, district North Kánara.

The station is denoted only by a circle and dot cut on the rock *in sitû*.

XX. Bailúr Hill Station, lat. 15° 45′, long. 74° 22′—observed at in 1866—is situated on the highest ridge of the hill, about 6¼ miles W. by S. of Kiniya village on the road from Jámboti to Belgaum, and 4¼ miles S.S.W. of that of Tudiya. It is in the lands of the village of Betgeri, táluka and district Belgaum.

The station consists of a platform of loose rubble enclosing a circular, isolated and perforated pillar of masonry 5 feet high, which contains two mark-stones, one in its upper surface and the other below: an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Betgeri N.E. by N., mile ¾; Mahálunga W.N.W., miles 2¼; and Boknúr E.N.E., miles 1½.

XXII. (*Of the Mangalore Meridional Series*). Yalúr Hill Station, lat. 15° 45′, long. 74° 34′—observed at in 1866—is situated near the S.W. corner of the ramparts of the hill fort of Yalúr lying 2½ miles E. of the Railway Station of Desúr, and about 7 miles S. by E. of the cantonment of Belgaum. The station is in Kurundvád State, Southern Marátha Agency.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in the upper surface of the pillar and the other 6 feet below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Yalúr N. by W., miles 2; Solgi N.W., mile 1; Desúr S.W. by W., miles 2; Náganhatti E. by S., miles 2¾; and Nandihalli S.E., miles 2¾.

XXIII. (*Of the Mangalore Meridional Series*). Samshergad Hill Station, lat. 15° 34′, long. 74° 34′—observed at in 1866—is situated on the highest of the three conical shaped hills, about 3 miles W. of the large village of Nandgad on the high road from Tinaighát to Kittúr, and 5½ miles S.S.E. of the town and Railway Station of Khánápur. The station is in the lands of the village of Nandgad, táluka Khánápur, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Naikol W.S.W., miles 1¾; Sávargali N.W. by N., miles 1¼; Hirĕbhalke S.W., miles 2; and Karanjol S. by E., miles 2.

October, 1889.

W. H. COLE,

In charge of Computing Office.

SOUTH KONKAN COAST SERIES.

PRINCIPAL TRIANGULATION. OBSERVED ANGLES.

At XXXI (Mándvi)

February 1842; *observed by Lieutenant W. S. Jacob with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on II: 321° 47′	141° 47′	341° 47′	161° 48′	1° 48′	181° 47′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
II & I	″ h 20·90, h 14·93	″ h 18·94, h 19·27	″ l 17·57, l 23·53	″ l 9·26, l 9·93	″ h 14·24, h 18·57, d 16·00	″ h 22·57, d 22·06	$M = 17''\cdot63$; $w = 0\cdot28$; $\frac{1}{w} = 3\cdot61$; $C = 75^\circ\ 50'\ 17''\cdot63$
	17·92	19·11	20·55	9·60	16·27	22·32	
I & XXXIV	h 32·73, h 38·20	h 41·93, h 42·27	d 39·06, d 35·70	l 36·50, l 38·50	h 39·73, h 39·20, d 39·06	d 34·82, d 35·52	$M = 37''\cdot83$; $w = 0\cdot79$; $\frac{1}{w} = 1\cdot26$; $C = 48^\circ\ 22'\ 37''\cdot84$
	35·47	42·10	37·38	37·50	39·33	35·17	

At XXXIV (Karanja)

February 1842; *observed by Lieutenant W. S. Jacob with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XXXI: 111° 31′	291° 31′	131° 31′	311° 31′	151° 31′	331° 31′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXXI & I	″ h 67·67, d 70·67, d 69·67	″ h 65·00, h 64·34	″ h 64·64, h 63·64	″ h 66·97, h 66·97	″ h 54·00, h 62·33, d 56·79	″ h 70·63, h 66·00, d 69·52	$M = 65''\cdot26$; $w = 0\cdot31$; $\frac{1}{w} = 3\cdot27$; $C = 59^\circ\ 30'\ 5''\cdot26$
	69·34	64·67	64·14	66·97	57·71	68·72	

NOTE.—Stations XXXI and XXXIV appertain to the Bombay Longitudinal Series.

At I (Titvi)

February 1842; *observed by Lieutenant W. S. Jacob with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XXXIV 200° 2′	20° 0′	220° 1′	40° 2′	240° 1′	60° 2′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXXIV & XXXI	″ h 28·70, h 29·30	″ h 23·30, h 20·06	″ h 26·97, h 27·03	″ h 21·23, h 21·87, h 20·76	″ h 22·77, h 23·77	″ h 22·64, h 26·74	$M = 24''\cdot49$; $w = 0\cdot61$; $\frac{1}{w} = 1\cdot64$
	29·00	21·68	27·00	21·29	23·27	24·69	$C = 72^\circ\ 7'\ 24''\cdot48$
XXXI & II	d 15·85, d 16·52	h 17·60, h 15·97	h 11·00, h 7·67	h 15·97, h 14·63, d 14·23	h 19·93, h 15·60	h 17·26, h 14·96	$M = 15''\cdot19$; $w = 0\cdot61$; $\frac{1}{w} = 1\cdot64$
	16·19	16·79	9·34	14·94	17·77	16·11	$C = 37^\circ\ 10'\ 15''\cdot19$
II & III	h 39·07, h 38·40	h 35·20, h 37·73	h 37·80, h 42·06	h 32·53, h 33·57, h 32·43, d 31·77	h 35·77, h 36·10	h 38·54, h 36·07	$M = 36''\cdot83$; $w = 0\cdot85$; $\frac{1}{w} = 1\cdot18$
	38·74	36·47	39·93	32·58	35·94	37·31	$C = 70^\circ\ 51'\ 36''\cdot79$

At II (Torna)

November 1842; *observed by Lieutenant W. S. Jacob with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on IV 184° 57′	4° 58′	204° 57′	24° 58′	224° 56′	44° 57′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
IV & III	″ d 14·00, d 13·33, d 13·67, d 13·67	″ h 10·66, d 11·99	″ l 19·00, l 14·00, h 10·33	″ l 6·00, l 9·33, h 11·34	″ h 18·34, h 16·67	″ h 5·00, h 11·33	$M = 12''\cdot34$; $w = 0\cdot41$; $\frac{1}{w} = 2\cdot44$
	13·67	11·33	14·44	8·89	17·51	8·17	$C = 66^\circ\ 1'\ 12''\cdot35$
III & I	h 34·00, h 34·66	h 34·67, h 33·34	l 20·67, d 23·33, d 26·99	l 32·00, h 29·00, d 27·50, d 30·50	h 30·00, h 26·67	h 37·66, h 36·00	$M = 31''\cdot15$; $w = 0\cdot24$; $\frac{1}{w} = 4\cdot12$
	34·33	34·01	23·66	29·75	28·34	36·83	$C = 42^\circ\ 3'\ 31''\cdot11$

NOTE.—Stations XXXI and XXXIV appertain to the Bombay Longitudinal Series.

At II (Torna)—(*Continued*).

Angle between	Circle readings, telescope being set on IV: 184° 57′	4° 58′	204° 57′	24° 58′	224° 56′	44° 57′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
I & XXXI	″ h 33·66 h 31·67	″ h 36·33 h 36·33	″ l 43·33 h 39·34 d 45·83	″ l 43·33 h 37·66 d 37·50 d 40·50	″ h 37·00 h 42·66 h 43·00	″ h 29·67 h 28·00	$M = 36''·89$ $w = 0·20$ $\frac{1}{w} = 5·10$ $C = 66° 59' 36''·97$
	32·67	36·33	42·83	39·75	40·89	28·84	

At III (Kanta).

October 1843; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on I: 40° 0′	220° 0′	60° 1′	240° 1′	80° 40′	260° 0′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
I & II	″ h 51·00 h 49·00 h 51·00 h 50·00 d 51·83 d 53·16	″ l 59·00 l 59·34 l 59·67 d 63·83 d 62·51	″ h 53·67 h 57·00 h 57·33 d 58·34	″ h 53·67 h 55·67 d 57·33 d 57·00	″ l 58·66 l 54·66	″ h 50·67 h 52·00	$M = 55''·40$ $w = 0·41$ $\frac{1}{w} = 2·44$ $C = 67° 4' 55''·42$
	51·00	60·87	56·59	55·92	56·66	51·34	
II & IV	h 33·66 h 35·34 d 36·08 d 37·41	l 26·34 l 27·66 d 31·17 d 30·83 d 30·50	h 30·33 h 28·33 d 31·67	h 32·33 h 33·67 d 35·66 d 35·33	l 27·67 l 31·00	h 31·67 h 30·33	$M = 31''·60$ $w = 0·75$ $\frac{1}{w} = 1·34$ $C = 35° 30' 31''·63$
	35·62	29·30	30·11	34·25	29·34	31·00	
IV & VI	d 45·22 d 43·89	d 53·00 d 56·00	h 51·67 d 52·23	h 53·00 d 51·16	d 47·67 d 48·34	h 58·33 h 57·67	$M = 51''·52$ $w = 0·26$ $\frac{1}{w} = 3·79$ $C = 40° 2' 51''·52$
	44·56	54·50	51·95	52·08	48·01	58·00	
VI & V	d 14·78 d 11·79 d 10·79	d 3·00 d 4·00 d 4·00	d 5·11 d 5·67	d 7·68 d 5·84	h 5·67 h 11·00	h 4·67 h 7·67	$M = 7''·13$ $w = 0·59$ $\frac{1}{w} = 1·69$ $C = 37° 57' 7''·14$
	12·45	3·67	5·39	6·76	8·34	6·17	

At IV (Mahábaleshvar)

March 1842; *observed by Lieutenant W. S. Jacob with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on VI: 177° 53′	357° 53′	197° 53′	17° 53′	217° 52′	37° 52′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
VI & V	″ d 38·60 d 40·61	″ h 45·54 d 40·51	″ h 42·86 d 40·94	″ d 36·42 d 36·09	″ h 42·84 h 43·50	″ h 38·20 h 36·56	$M = 40''\cdot 23$ $w = 0\cdot 63$ $\frac{1}{w} = 1\cdot 59$ $C = 44^\circ 10' 40''\cdot 23$
	39·61	43·03	41·90	36·26	43·17	37·38	
V & III	d 46·73 d 47·73	d 34·43 d 33·80	h 40·80 d 45·20	h 37·13 h 37·46	h 33·23 h 33·23	h 39·86 h 40·80	$M = 39''\cdot 20$ $w = 0\cdot 20$ $\frac{1}{w} = 4\cdot 90$ $C = 51^\circ 2' 39''\cdot 20$
	47·23	34·12	43·00	37·30	33·23	40·33	
III & II	d 16·89 d 15·89	d 27·02 d 29·69	h 18·96 l 18·03 h 20·34	d 22·76 d 22·76	h 32·67 h 31·67	h 19·90 h 21·26 d 20·76	$M = 23''\cdot 24$ $w = 0\cdot 17$ $\frac{1}{w} = 5\cdot 95$ $C = 78^\circ 28' 23''\cdot 24$
	16·39	28·36	19·11	22·76	32·17	20·64	
II & R.M.	l 38·94 h 35·36	l 30·97 l 33·30 h 29·67	h 42·37 l 37·67 l 40·33	h 38·40 h 38·07	h 36·63 h 36·30	h 37·44 h 33·77 d 35·79	$M = 36''\cdot 49$ $w = 0\cdot 62$ $\frac{1}{w} = 1\cdot 63$ $C = 8^\circ 26' 36''\cdot 48$
	37·15	31·31	40·12	38·24	36·47	35·67	

At V (Adhúr)

October 1843; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on III: 20° 0′	200° 0′	40° 1′	220° 1′	60° 0′	240° 0′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
III & IV	″ h 28·34 h 29·00 d 26·00	″ h 30·67 h 35·00 h 32·00	″ h 26·34 h 28·00 h 28·33 d 30·84	″ h 38·00 h 36·67	″ h 30·34 h 30·33 h 24·00	″ h 27·67 h 31·33 h 34·34 h 31·33	$M = 30''\cdot 91$ $w = 0\cdot 40$ $\frac{1}{w} = 2\cdot 48$ $C = 50^\circ 57' 30''\cdot 85$
	27·78	32·56	28·38	37·34	28·22	31·17	

NOTE.—R.M. denotes Referring Mark.

At V (Adhúr)—(*Continued*).

Angle between	Circle readings, telescope being set on III 20° 0′	200° 0′	40° 1′	220° 1′	60° 0′	240° 0′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	
IV & VI	h 36·00 h 33·00 d 31·83	h 33·33 h 28·66	h 42·33 h 39·33 d 44·11	h 28·67 h 31·66	h 39·66 h 40·67 h 42·67	h 37·00 h 37·66 h 37·00 d 36·66	$M = 35''\cdot80$ $w = 0\cdot23$ $\frac{1}{w} = 4\cdot37$ $C = 46^\circ\ 32'\ 35''\cdot81$
	33·61	31·00	41·92	30·17	41·00	37·08	
VI & VII	h 15·66 h 12·66 d 11·49	h 16·67 h 16·34	h 4·33 h 5·34 d 8·12	h 17·66 h 14·67	h 11·67 h 7·33 h 6·33	h 8·34 h 7·67 h 15·00 d 9·78	$M = 11''\cdot75$ $w = 0\cdot30$ $\frac{1}{w} = 3\cdot34$ $C = 77^\circ\ 42'\ 11''\cdot71$
	13·27	16·51	5·93	16·17	8·44	10·20	

At VI (Kumbhárli)

October and November 1843; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on VIII 232° 59′	53° 1′	252° 55′	72° 55′	272° 55′	92° 55′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	
VIII & VII	h 42·67 h 48·00 h 49·33	h 38·67 h 39·66	h 37·00 h 37·66	h 43·67 h 44·66 d 41·84	l 33·67 h 41·67 d 35·12	l 47·33 l 49·00 h 43·67	$M = 41''\cdot68$ $w = 0\cdot27$ $\frac{1}{w} = 3\cdot76$ $C = 59^\circ\ 52'\ 41''\cdot73$
	46·67	39·17	37·33	43·39	36·82	46·67	
VII & V	h 65·00 h 59·33 h 55·67 d 62·33	h 68·66 h 67·67	h 67·00 h 64·67	h 63·00 d 61·17 d 60·18 d 63·77	l 70·33 h 68·00 h 69·34 d 66·67	h 64·67 d 60·50 d 59·83	$M = 64''\cdot48$ $w = 0\cdot44$ $\frac{1}{w} = 2\cdot29$ $C = 42^\circ\ 39'\ 4''\cdot42$
	60·58	68·17	65·84	62·03	68·59	61·67	
V & III	h 60·67 h 62·00 h 63·33 d 64·33	h 55·00 h 54·00	h 63·00 h 63·00	h 55·00 l 57·33 l 55·33	l 56·33 l 55·33 h 52·00 h 51·00	h 54·33 h 56·00 d 50·67	$M = 57''\cdot22$ $w = 0\cdot30$ $\frac{1}{w} = 3\cdot38$ $C = 44^\circ\ 32'\ 57''\cdot20$
	62·58	54·50	63·00	55·89	53·67	53·67	

At VI (Kumbhárli)—(*Continued*).

Angle between	Circle readings, telescope being set on VIII: 232° 59′	53° 1′	252° 55′	72° 55′	272° 55′	92° 55′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	
III & IV	h 54·33 h 52·34	h 53·67 h 56·33	h 52·00 h 50·33	h 59·00 h 55·33 h 56·67	h 57·33 h 56·00	h 55·34 h 60·00 h 56·66	$M = 55''\cdot09$ $w = 0\cdot88$ $\frac{1}{w} = 1\cdot14$ $C = 44^\circ 43' 55''\cdot13$
	53·34	55·00	51·17	57·00	56·67	57·33	

At VII (Mirya)

* *November* 1843; *and* † *October* 1844; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on V: 352° 4′	172° 4′	12° 5′	192° 5′	32° 4′	212° 4′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	
* V & VI	d 51·58 d 52·59 d 53·25	h 46·00 h 42·00	d 39·48 d 40·14 d 39·81	d 48·56 d 48·56	d 40·10 d 38·09	h 55·34 h 52·66 h 48·67	$M = 46''\cdot03$ $w = 0\cdot17$ $\frac{1}{w} = 6\cdot06$ $C = 59^\circ 38' 46''\cdot07$
	52·47	44·00	39·81	48·56	39·10	52·22	
* VI & VIII	h 55·00 h 58·00 d 56·01 d 55·00 d 54·34	h 62·33 d 62·00	h 63·00 h 61·00 h 59·67 h 61·66	h 56·00 d 52·16 d 52·16	h 66·66 h 72·34 d 64·58	h 62·00 h 61·34	$M = 60''\cdot36$ $w = 0\cdot22$ $\frac{1}{w} = 4\cdot59$ $C = 54^\circ 48' 0''\cdot34$
	55·67	62·17	61·33	53·44	67·86	61·67	
* VIII & IX	h 18·00 h 16·33 h 20·33 d 17·99	h 13·33 d 13·50	h 12·66 h 14·67 h 16·33 h 15·66	h 21·00 h 22·67	h 18·00 h 10·66	h 11·66 d 5·43 d 10·77	$M = 15''\cdot31$ $w = 0\cdot30$ $\frac{1}{w} = 3\cdot31$ $C = 70^\circ 56' 15''\cdot29$
	18·16	13·42	14·83	21·84	14·33	9·29	
† V & R.M.	h 16·66 h 16·33	h 9·33 h 12·67 h 10·00	h 17·66 h 18·67	h 15·67 h 15·00	h 8·66 h 9·00	h 14·00 h 14·66	$M = 13''\cdot97$ $w = 0\cdot46$ $\frac{1}{w} = 2\cdot16$ $C = 17^\circ 56' 13''\cdot96$
	16·50	10·67	18·17	15·34	8·83	14·33	

NOTE.—R.M. denotes Referring Mark.

At VIII (Manoli)

November 1843; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on X: 206° 7′	26° 7′	226° 7′	46° 7′	246° 6′	66° 6′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	
X & IX	h 40·00 h 39·00 h 37·67	h 31·33 h 29·34 h 26·00	h 35·00 h 32·34	h 32·00 h 28·00	h 34·67 h 32·33	h 29·67 h 29·33	$M = 32''\cdot41$ $w = 0\cdot39$ $\frac{1}{w} = 2\cdot55$ $C = 53^\circ 56' 32''\cdot42$
	38·89	28·89	33·67	30·00	33·50	29·50	
IX & VII	h 13·00 h 13·67 d 16·33	h 18·00 h 21·66 d 19·78	h 8·34 h 11·66 d 10·00	h 19·00 h 21·00	h 17·67 h 18·67	h 21·00 h 20·67	$M = 17''\cdot19$ $w = 0\cdot33$ $\frac{1}{w} = 3\cdot06$ $C = 54^\circ 37' 17''\cdot17$
	14·33	19·81	10·00	20·00	18·17	20·84	
VII & VI	h 24·34 h 23·00 d 26·66	h 21·34 h 19·67 h 21·67 d 20·84	h 26·66 h 26·67 d 26·67	h 16·00 h 17·33	h 22·66 h 24·00	h 21·33 h 19·00	$M = 22''\cdot07$ $w = 0\cdot46$ $\frac{1}{w} = 2\cdot18$ $C = 65^\circ 19' 22''\cdot08$
	24·67	20·88	26·67	16·67	23·33	20·17	

At IX (Ghirya)

December 1843; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on VII: 140° 0′	320° 1′	160° 0′	340° 0′	180° 0′	0° 0′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	
VII & VIII	h 31·33 h 28·33 d 32·82	h 37·34 h 33·67 d 32·45	h 28·33 h 29·67	h 40·34 h 39·00 h 33·00	h 28·66 h 30·66 d 27·50	h 36·33 h 32·66 h 34·00 h 33·34	$M = 32''\cdot47$ $w = 0\cdot46$ $\frac{1}{w} = 2\cdot17$ $C = 54^\circ 26' 32''\cdot51$
	30·83	34·49	29·00	37·45	28·94	34·08	
VIII & X	h 57·67 h 60·00 d 61·83	h 60·33 d 55·44 d 59·11	h 70·33 d 70·66	h 57·33 h 66·00 h 60·00	h 68·67 h 69·67 d 67·01	h 66·67 h 61·67 h 64·66	$M = 63''\cdot75$ $w = 0\cdot23$ $\frac{1}{w} = 4\cdot29$ $C = 52^\circ 7' 3''\cdot72$
	59·83	58·29	70·50	61·11	68·45	64·33	

At IX (Ghirya)—(*Continued*).

Angle between	Circle readings, telescope being set on VII: 140° 0′	320° 1′	160° 0′	340° 0′	180° 0′	0° 0′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	
X & XI	h 42·00 h 38·00 d 38·67	d 34·11 d 30·44 d 29·44 d 30·11	d 32·17 d 30·17	d 28·10 d 28·77	d 30·23 d 29·22	d 27·59 d 26·59	$M = 31''·17$ $w = 0·30$ $\frac{1}{w} = 3·37$
	39·56	31·03	31·17	28·44	29·73	27·09	$C = 62° 45' 31''·20$

At X (Valvan)

November 1843; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XII: 333° 6′	153° 6′	353° 6′	173° 6′	13° 7′	193° 8′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	
XII & XI	d 8·33 d 8·34	d 6·78 d 6·78	d 6·11 d 11·11	d 9·77 d 3·10 d 7·11 d 8·10	d 4·56 d 3·23	d 6·78 d 7·11	$M = 6''·93$ $w = 1·46$ $\frac{1}{w} = 0·69$
	8·34	6·78	8·61	7·02	3·90	6·95	$C = 51° 1' 6''·93$
XI & IX	h 54·00 h 53·67	h 63·00 h 60·00 h 58·67	h 56·33 h 54·34 h 59·33	h 60·00 h 57·33 h 62·33	h 55·33 h 56·67 h 55·67	h 56·66 h 54·00	$M = 57''·03$ $w = 0·74$ $\frac{1}{w} = 1·34$
	53·84	60·56	56·67	59·89	55·89	55·33	$C = 61° 55' 57''·07$
IX & VIII	h 30·34 h 30·66	h 19·33 h 19·33 h 23·33	h 23·00 h 30·00 h 26·67	h 31·34 h 23·67 h 25·67 h 20·67	h 28·00 h 28·00 h 29·66	h 27·67 h 30·00	$M = 26''·74$ $w = 0·41$ $\frac{1}{w} = 2·42$
	30·50	20·66	26·56	25·34	28·55	28·84	$C = 73° 56' 26''·66$

At XI (Parule)

December 1843; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on IX: 24° 41′	204° 42′	44° 41′	224° 41′	64° 41′	244° 41′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	
IX & X	h 42·33 h 44·67	h 38·33 h 43·00	h 33·33 h 35·33	h 43·33 h 41·33	h 44·33 h 43·00 h 42·00	h 41·34 h 42·00	$M = 40''·94$ $w = 0·49$ $\frac{1}{w} = 2·05$
	43·50	40·67	34·33	42·33	43·11	41·67	$C = 55° 18' 40''·95$

At XI (Parule)—(*Continued*).

**December* 1843; *and* †*February* 1844; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on IX 24° 11′	 204° 42′	 44° 41′	 224° 41′	 64° 41′	 244° 41′	M = Mean of Groups w = Relative Weight C = Concluded Angle
X *& XII	″ h 64·34 h 66·67	″ h 65·67 h 56·67 h 56·67 d 60·78	″ h 64·34 h 59·00 h 66·66 h 69·67 h 68·33	″ h 56·33 h 57·33	″ h 67·00 h 64·00	″ h 68.67 h 68·33	$M = 63''·65$ $w = 0·27$ $\frac{1}{w} = 3·72$ $C = 58° 29' 3''·62$
	65·51	59·95	65·60	56·83	65·50	68·50	
	Circle readings, telescope being set on XII 38° 29′	 218° 28′	 58° 29′	 238° 29′	 78° 29′	 258° 28′	
XII †& XIV	″ h 0·33 h 2·33	″ h 1·00 h 3·67 d 4·00	″ h 1·33 h 2·00 h 3·33 d 5·83 d 0·83	″ h 5·67 h 2·66 h 4·67 d 4·83	″ h 3·34 h 4·34	″ h 0·00 h 3·33 h 4·66	$M = 2''·97$ $w = 3·09$ $\frac{1}{w} = 0·32$ $C = 29° 45' 3''·01$
	1·33	2·89	2·66	4·46	3·84	2·66	
XIV †& XIII	h 4·00 h 2·00	h 13·00 h 8·33 d 12·33	h 0·67 h 5·67 d 5·17 d 4·50 d 3·17	h 2·00 h 8·34 d 5·67	h 6·00 h 6·00	h 1·33 h 3·33 h 1·00	$M = 5''·22$ $w = 0·50$ $\frac{1}{w} = 2·00$ $C = 26° 48' 5''·22$
	3·00	11·22	3·84	5·34	6·00	1·89	

At XII (Chaukola)

December 1843; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XIV 329° 38′	 149° 38′	 349° 39′	 169° 39′	 9° 38′	 189° 39′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XIV & XIII	d 43·44 d 45·44 d 41·44 d 42·78	d 42·17 d 42·17 d 43·18	d 38·12 d 41·12	d 46·00 d 44·00	d 53·50 d 56·17	d 58·27 d 51·61 d 55·94	$M = 46''·75$ $w = 0·13$ $\frac{1}{w} = 7·58$ $C = 40° 24' 46''·75$
	43·28	42·51	39·62	45·00	54·84	55·27	

At XII (Chaukola)—(*Continued*).

Angle between	Circle readings, telescope being set on XIV						M = Mean of Groups w = Relative Weight C = Concluded Angle
	329° 38′	149° 38′	349° 39′	169° 39′	9° 38′	189° 39′	
	″	″	″	″	″	″	
XIII & XI	h 22·33 h 22·33 h 25·67 h 23·33	h 25·67 h 27·34 h 26·33	h 21·33 h 26·34 h 24·00	h 27·33 h 31·00	h 17·00 h 19·00 h 22·33 h 26·33	h 17·00 h 19·33	$M = 23''·71$ $w = 0·36$ $\frac{1}{w} = 2·76$ $C = 70° 5' 23''·70$
	23·42	26·45	23·89	29·17	21·17	18·17	
XI & X	h 68·34 h 64·67 d 66·66 d 67·66	h 58·67 h 58·00 d 57·50	h 67·67 h 69·67 h 64·33 d 66·22	h 58·34 d 58·84 d 57·18	h 59·33 h 57·33 h 59·33 h 55·00	h 62·00 h 61·33 h 60·33	$M = 61''·49$ $w = 0·31$ $\frac{1}{w} = 3·27$ $C = 70° 30' 1''·49$
	66·83	58·06	66·97	58·12	57·75	61·22	
X & R.M.	h 30·33 h 32·00 h 30·00 h 30·33 d 30·82 d 31·82	h 33·00 h 32·00 d 31·66	h 27·66 h 26·00 h 25·67 d 25·44	h 29·00 h 30·66 d 29·50	h 30·67 h 28·67 h 29·00 h 28·67	h 26·34 h 29·67 h 29·00	$M = 29''·43$ $w = 1·31$ $\frac{1}{w} = 0·76$ $C = 19° 21' 29''·43$
	30·88	32·22	26·19	29·72	29·25	28·34	

At XIII (Agoada)

February 1844; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XI						M = Mean of Groups w = Relative Weight C = Concluded Angle
	178° 23′	358° 22′	198° 24′	18° 24′	218° 24′	38° 24′	
	″	″	″	″	″	″	
XI & XII	h 27·00 h 26·34 d 24·34	h 36·00 d 33·00 d 32·00	h 32·66 h 38·67 h 32·67	h 23·34 h 31·34	h 37·34 h 34·33 h 31·33	h 19·00 h 25·33	$M = 29''·68$ $w = 0·20$ $\frac{1}{w} = 5·10$ $C = 53° 21' 29''·73$
	25·89	33·67	34·67	27·34	34·33	22·17	
XII & XIV	h 70·34 h 68·66 h 68·00 d 66·67	h 54·67 h 57·33 h 56·00 d 52·50	h 56·67 h 53·66 h 54·33	h 60·66 h 53·00 h 53·33	h 60·66 h 58·00 h 60·34 h 63·67	h 68·00 h 62·00 h 69·34	$M = 60''·20$ $w = 0·16$ $\frac{1}{w} = 6·29$ $C = 48° 15' 0''·22$
	68·42	55·13	54·89	55·66	60·67	66·45	

NOTE.—R. M. denotes Referring Mark.

At XIII (Agoada)—(*Continued*).

Angle between	Circle readings, telescope being set on XI 178° 23′	358° 22′	198° 24′	18° 24′	218° 24′	38° 24′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XIV & XVI	″ h 25·33 h 21·66 d 21·33	″ h 21·00 h 19·67	″ h 27·00 h 30·33 h 30·66 d 31·68 d 27·34	″ h 32·00 h 31·34 d 31·67	″ h 33·66 h 27·67 h 23·66 d 29·67	″ h 16·67 h 16·00	$M = 24''\cdot87$ $w = 0\cdot16$ $\frac{1}{w} = 6\cdot25$ $C = 50^\circ\ 4'\ 24''\cdot95$
	22·77	20·34	29·40	31·67	28·67	16·34	
XVI & XV	h 62·67 d 58·83 d 62·16	d 67·11 d 68·44	h 61·66 h 66·00 d 66·34 d 63·01 d 62·68	h 53·00 h 57·00 d 55·00	h 63·00 d 63·01 d 65·67	h 62·00 d 62·33	$M = 62''\cdot33$ $w = 0\cdot32$ $\frac{1}{w} = 3\cdot15$ $C = 26^\circ\ 18'\ 2''\cdot32$
	61·22	67·78	63·94	55·00	63·89	62·17	

January 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XVIII 0° 1′	180° 1′	79° 12′	259° 11′	158° 22′	338° 22′	237° 31′	57° 31′	316° 44′	136° 44′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVIII & XVII	″ h 32·08 h 34·22	″ h 33·98 h 33·42 h 31·38	″ h 33·96 h 34·28	″ h 35·36 h 36·48	″ h 34·38 d 33·86	″ h 35·68 d 31·67	″ h 31·40 h 34·02	″ h 36·50 h 36·46	″ h 34·18 l 34·00	″ h 34·46 l 34·12	$M = 34''\cdot14$ $w = 5\cdot24$ $\frac{1}{w} = 0\cdot19$ $C = 45^\circ\ 3'\ 34''\cdot13$
	33·15	32·93	34·12	35·92	34·12	33·68	32·71	36·48	34·09	34·29	
XIV & XVII	h 10·00 h 11·46	h 11·68 h 8·64 h 7·32	h 10·42 h 9·30	h 10·42 h 10·44	h 10·30 h 10·32	h 10·08 h 8·92	h 9·68 h 11·90	h 11·38 h 13·36	h 10·50 l 12·56	h 9·52 l 11·52	$M = 10''\cdot53$ $w = 7\cdot30$ $\frac{1}{w} = 0\cdot14$ $C = 43^\circ\ 40'\ 10''\cdot51$
	10·73	9·21	9·86	10·43	10·31	9·50	10·79	12·37	11·53	10·52	

At XIV (Salili)

January 1844; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XVI 208° 43′	28° 41′	228° 41′	48° 42′	248° 42′	68° 42′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVI & XV	″ h 76·67 h 74·33 h 77·67	″ h 66·67 h 66·00 h 68·00	″ h 73·66 h 74·00	″ h 72·00 h 67·33 h 62·00 h 65·34	″ h 62·00 h 70·33 h 69·67 h 68·00	″ h 68·67 h 70·33 d 57·67	$M = 69''\cdot45$ $w = 0\cdot26$ $\frac{1}{w} = 3\cdot86$ $C = 34^\circ\ 41'\ 9''\cdot36$
	76·22	66·89	73·83	66·67	67·50	65·56	

At XIV (Salili)—(*Continued*).

Angle between	Circle readings, telescope being set on XVI						M = Mean of Groups w = Relative Weight C = Concluded Angle
	208° 43′	28° 41′	228° 41′	48° 42′	248° 42′	68° 42′	
XV & XIII	″ h 53·33 h 51·67 d 51·00	″ h 61·00 h 62·67 h 58·33	″ h 54·33 h 52·00 d 51·22	″ h 62·67 h 68·00 h 65·33 d 61·23	″ h 60·67 h 62·00 h 58·00 h 56·00	″ h 66·66 h 75·33 d 59·17	$M = 59''\cdot 29$ $w = 0\cdot 15$ $\frac{1}{w} = 6\cdot 67$
	52·00	60·67	52·52	64·31	59·17	67·05	$C = 65^\circ\ 1'\ 59''\cdot 29$
XIII & XI	h 26·34 h 26·33 h 26·33 d 24·83	h 25·00 h 25·00 h 25·00	h 25·33 h 26·67 h 28·34 d 24·83	h 21·00 h 18·34 h 18·00 d 15·01	h 29·33 h 20·67 h 32·33 h 32·34	h 20·67 h 13·34 h 20·66	$M = 23''\cdot 71$ $w = 0\cdot 27$ $\frac{1}{w} = 3\cdot 65$
	25·96	25·00	26·29	18·09	28·67	18·22	$C = 51^\circ\ 35'\ 23''\cdot 73$
XI & XII	h 58·00 h 61·34	h 53·00 h 53·67	h 54·00 h 55·67	h 62·00 h 60·33	h 56·33 h 49·00 h 52·67 h 54·00	h 58·00 h 60·33 h 60·33	$M = 56''\cdot 93$ $w = 0\cdot 42$ $\frac{1}{w} = 2\cdot 38$
	59·67	53·34	54·84	61·17	53·00	59·55	$C = 39^\circ\ 44'\ 56''\cdot 91$

January 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No* 2.

Angle between	Circle readings, telescope being set on XVII										M = Mean of Groups w = Relative Weight C = Concluded Angle
	359° 54′	179° 54′	78° 50′	258° 50′	158° 24′	338° 24′	237° 37′	57° 36′	316° 48′	136° 48′	
XVII & XIII	″ h 4·14 h 6·04	″ h 3·84 h 5·04	″ h 4·28 h 4·66	″ h 5·68 h 4·24	″ h 1·58 h 1·70 h 3·44	″ h 3·26 h 3·40	″ h 2·20 h 3·84	″ h 1·10 h 1·78	″ h 6·78 h 5·54	″ h 5·42 h 3·00 h 2·88	$M = 3''\cdot 89$ $w = 4\cdot 34$ $\frac{1}{w} = 0\cdot 23$
	5·09	4·44	4·47	4·96	2·24	3·33	3·02	1·44	6·16	3·77	$C = 64^\circ\ 58'\ 3''\cdot 88$

At XV (Pil)

January 1844; *observed by Lieutenant H. Rivers with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XIII						M = Mean of Groups w = Relative Weight C = Concluded Angle
	341° 24′	61° 24	1° 24′	181° 24′	21° 25′	201° 25′	
XIII & XIV	″ h 28·66 h 29·33 h 32·00	″ h 26·67 h 27·34	″ h 35·00 h 33·34 h 31·33	″ h 33·33 h 31·00	″ h 27·66 h 32·66 h 31·00	″ h 26·00 h 30·00 h 26·33	$M = 30''\cdot 05$ $w = 0\cdot 84$ $\frac{1}{w} = 1\cdot 19$
	30·00	27·01	33·22	32·17	30·44	27·44	$C = 38^\circ\ 35'\ 30''\cdot 06$

At XV (Pil)—(*Continued*).

Angle between	Circle readings, telescope being set on XIII: 341° 24′	161° 24′	1° 24′	181° 24′	21° 25′	201° 25′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	
XIV & XVI	h 26·00 h 27·00 h 25·33	h 35·67 h 34·00	h 28·66 h 27·33	h 33·34 h 32·00	h 28·00 h 29·00 h 25·34 h 27·00	h 27·34 h 29·34 h 24·00 h 26·00	$M = 29''·27$ $w = 0·44$ $\frac{1}{w} = 2·26$ $C = 70° 38' 29''·24$
	26·11	34·84	28·00	32·67	27·34	26·67	

At XVI (Kumbhári)

January 1844; *observed by Lieutenant H. Rivers, with Dollond's* 15-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XV: 304° 31′	124° 31′	324° 31′	144° 31′	344° 32′	164° 32′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	
XV & XIII	h 54·33 h 49·67 h 49·67 h 55·33	h 55·34 h 51·00 h 54·34	h 49·00 h 45·33 h 49·00	h 47·00 h 44·33 h 43·66	h 50·67 h 53·33 h 45·00	h 44·00 h 45·66 h 44·33 h 47·00	$M = 48''·92$ $w = 0·42$ $\frac{1}{w} = 2·36$ $C = 44° 27' 48''·92$
	52·25	53·56	47·78	45·00	49·67	45·25	
XIII & XIV	h 25·33 h 28·33 h 26·00 d 24·45	h 19·00 h 26·33 h 26·33	h 29·33 h 30·00 h 29·33	h 24·33 h 26·34 h 28·00 h 26·00	h 23·67 h 26·34 h 30·33	h 32·33 h 35·00 h 32·67 h 31·34	$M = 27''·54$ $w = 0·53$ $\frac{1}{w} = 1·87$ $C = 30° 12' 27''·55$
	26·03	23·89	29·55	26·17	26·78	32·84	
XIV & R.M.	h 47·00 h 44·67 h 43·00 d 42·79	h 44·66 h 43·00 h 41·00	h 47·00 h 44·00 h 42·00	h 53·00 h 44·00 h 48·00 h 45·00	h 49·00 h 45·33 h 44·33	h 47·67 h 44·34 h 45·00 h 45·34 h 44·00	$M = 45''·10$ $w = 1·52$ $\frac{1}{w} = 0·66$ $C = 20° 48' 45''·13$
	44·37	42·89	44·33	47·50	46·22	45·27	

NOTE.—R.M. denotes Referring Mark.

At XVII (Bori)

January 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XIII: 244° 21′	64° 12′ / 64° 16′	79° 9′	259° 8′	158° 19′	338° 19′	237° 36′	57° 36′	316° 2′	136° 2′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XIII & XIV	h 49·26 h 50·60	h 50·04 h 47·30 h 47·36	h 46·68 h 49·34	h 50·76 h 49·08	h 47·26 l 45·18	h 49·96 h 49·62	h 46·94 h 46·10	h 45·34 h 46·48	h 44·96 h 47·76 h 50·00	h 45·62 h 45·94 h 47·80	$M = 47''·86$ $w = 3·19$ $\frac{1}{w} = 0·31$ $C = 71° 21' 47''·85$
	49·93	48·23	48·01	49·92	46·22	49·79	46·52	45·91	47·57	46·45	
XIII & XVIII	h 64·74 h 62·08	h 63·78 h 65·14 h 62·46	h 63·02 h 64·10	h 64·34 h 62·54	h 63·44 h 57·92	h 62·24 h 64·52	h 61·40 h 62·84	h 62·52 h 63·32	h 61·76 h 63·20	h 62·96 h 60·12 h 63·30	$M = 62''·79$ $w = 5·92$ $\frac{1}{w} = 0·17$ $C = 75° 3' 2''·80$
	63·41	63·79	63·56	63·44	60·68	63·38	62·12	62·92	62·48	62·13	
XVIII & XIX	h 20·54 h 23·02 h 18·98 h 22·54	h 21·04 h 20·82	h 19·60 h 20·12	h 21·96 h 21·92	h 22·86 h 23·58	h 23·02 h 21·48	h 22·70 h 22·50	h 22·10 h 21·80	h 20·94 h 19·28	h 22·38 h 23·36 h 19·44	$M = 21''·59$ $w = 6·38$ $\frac{1}{w} = 0·16$ $C = 40° 36' 21''·59$
	21·27	20·93	19·86	21·94	23·22	22·25	22·60	21·95	20·11	21·73	

At XVIII (Jarma)

February 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XX: 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XX & XIX	h 43·42 h 43·16	h 43·00 h 41·92	h 45·18 h 44·40	h 40·98 h 40·48	l 41·28 l 42·56	l 41·92 l 42·92	h 41·76 h 41·22	h 41·36 h 41·64	h 41·08 h 41·12	h 40·08 h 40·84	$M = 42''·02$ $w = 5·70$ $\frac{1}{w} = 0·18$ $C = 56° 20' 42''·02$
	43·29	42·46	44·79	40·73	41·92	42·42	41·49	41·50	41·10	40·46	
XIX & XVII	h 55·86 h 56·14	h 55·74 h 57·14	h 57·50 h 57·36	h 59·40 h 58·72	l 57·38 l 56·78	l 57·88 l 57·92	h 57·42 h 57·86	h 57·38 h 57·26	h 58·08 h 56·80	h 57·20 h 57·26	$M = 57''·35$ $w = 13·50$ $\frac{1}{w} = 0·07$ $C = 80° 31' 57''·35$
	56·00	56·44	57·43	59·06	57·08	57·90	57·64	57·32	57·44	57·23	
XVII & XIII	h 26·98 h 25·80	h 23·06 h 24·78	h 25·50 h 24·36	h 24·08 l 23·78	l 23·28 l 22·20	l 25·80 l 24·94	h 25·44 h 25·96	h 24·86 h 25·70	h 24·62 h 25·06	h 26·62 h 26·34	$M = 24''·96$ $w = 6·80$ $\frac{1}{w} = 0·15$ $C = 59° 53' 24''·96$
	26·39	23·92	24·93	23·93	22·74	25·37	25·70	25·28	24·84	26·48	

At XIX (Darsinga)

February 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XVII: 0° 0′	180° 0′	48° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XVII & XVIII	″ h 43·70 h 42·94	″ h 42·02 h 42·52	″ h 43·74 h 42·98	″ h 41·94 h 43·16	″ h 43·06 h 44·28	″ h 42·46 h 42·48	″ l 41·40 l 40·74	″ h 42·94 l 41·38	″ l 42·62 l 43·30	″ l 42·46 l 42·84	M = 42″·65 w = 14·90 1/w = 0·07
	43·32	42·27	43·36	42·55	43·67	42·47	41·07	42·16	42·96	42·65	C = 58° 51′ 42″·65
XVIII & XX	h 49·56 h 48·32	h 48·82 h 48·96	h 48·62 h 48·74	h 49·16 h 49·34	h 48·12 h 47·98	h 50·78 h 49·68	l 48·74 l 49·86	h 48·90 h 49·32	l 48·76 l 48·66	l 49·28 l 49·28	M = 49″·04 w = 26·30 1/w = 0·04
	48·94	48·89	48·68	49·25	48·05	50·23	49·30	49·11	48·71	49·28	C = 80° 33′ 49″·04
XX & XXIII	h 0·58 h 1·34	h 3·68 h 3·54	h 1·84 h 2·14	h 2·46 h 2·64	h 1·08 h 0·56	h 3·10 h 2·90	l 3·16 l 2·34	h 2·84 h 1·68	l 1·76 l 2·60	l 1·24 l 1·12	M = 2″·13 w = 11·20 1/w = 0·09
	0·96	3·61	1·99	2·55	0·82	3·00	2·75	2·26	2·18	1·18	C = 67° 37′ 2″·13

At XX (Bailúr)

February 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXII: 210° 14′	30° 14′	253° 27′	73° 27′	296° 38′	116° 38′	339° 51′	159° 51′	23° 2′	203° 2′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXII & XXIII	″ h 52·98 h 51·74	″ h 50·40 h 49·54	″ h 51·48 h 51·70	″ h 50·76 h 52·04	″ h 52·16 h 51·94	″ h 52·88 h 52·70	″ l 53·44 l 51·96	″ h 51·90 h 51·98	″ l 53·04 l 51·26	″ l 52·30 l 51·54	M = 51″·89 w = 12·70 1/w = 0·08
	52·36	49·97	51·59	51·40	52·05	52·79	52·70	51·94	52·15	51·92	C = 47° 9′ 51″·89
XXIII & XIX	h 28·36 h 28·32	h 27·44 h 26·60	h 30·12 h 29·56	h 27·08 h 27·72	h 28·56 h 28·00	h 25·74 h 25·84	l 27·14 l 27·96	h 27·72 h 27·28	l 27·62 l 27·12	l 28·32 l 27·96	M = 27″·72 w = 8·80 1/w = 0·11
	28·34	27·02	29·84	27·40	28·28	25·79	27·55	27·50	27·37	28·14	C = 59° 30′ 27″·72
XIX & XVIII	h 31·04 h 31·02	h 30·86 h 31·50	h 29·58 h 29·60	h 30·68 h 29·02	h 30·28 h 31·18	h 31·04 h 31·60	l 30·74 l 31·70	h 29·96 h 30·56	l 29·98 l 30·38	l 29·74 l 29·64	M = 30″·51 w = 18·90 1/w = 0·05
	31·03	31·18	29·59	29·85	30·73	31·32	31·22	30·26	30·18	29·69	C = 43° 5′ 30″·51

Note.—Stations XXII and XXIII appertain to the Mangalore Meridional Series.

At XXII (Yalúr)

February 1866; *observed by Captain C. T. Haig, R.E., with Barrow'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
	129° 46′	309° 46′	172° 58′	352° 58′	216° 9′	36° 9′	259° 22′	79° 22′	302° 33′	122° 33′	
XXIII & XX	″	″	″	″	″	″	″	″	″	″	$M = 5''{\cdot}96$
	h 6·82	h 5·28	l 7·34	l 6·80	h 4·36	h 3·82	h 5·08	h 7·08	h 6·70	h 6·06	$w = 6{\cdot}80$
	h 5·80	h 5·60	l 7·36	l 6·30	h 3·58	h 4·52	h 5·74	h 7·60	h 6·86	h 6·44	$\frac{1}{w} = 0{\cdot}15$
	6·31	5·44	7·35	6·55	3·97	4·17	5·41	7·34	6·78	6·25	$C = 86° 16' 5''{\cdot}96$

At XXIII (Samshergad)

January and February 1866; *observed by Captain C. T. Haig, R.E., with Barrow's 24-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XIX										M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	145° 55′	325° 55′	189° 7′	9° 7′	232° 18′	52° 18′	275° 31′	95° 31′	318° 42′	138° 42′	
XIX & XX	″	″	″	″	″	″	″	″	″	″	$M = 33''{\cdot}19$
	h 32·70	h 34·52	h 33·02	h 33·28	h 32·64	h 32·28	h 33·58	h 32·94	h 33·44	h 33·28	$w = 10{\cdot}30$
	h 32·78	h 34·30	h 34·74	h 35·06	h 32·80	h 31·60	h 32·80	h 32·48	h 32·38	h 33·26	$\frac{1}{w} = 0{\cdot}10$
	32·74	34·41	33·88	34·17	32·72	31·94	33·19	32·71	32·91	33·27	$C = 52° 52' 33''{\cdot}19$
XX & XXII	h 2·58	h 2·70	l 2·74	h 3·54	l 2·60	l 2·40	h 3·76	l 4·12	h 3·54	h 4·40	$M = 3''{\cdot}31$
	h 4·20	h 3·18	l 2·28	h 3·50	l 3·86	l 1·68	h 3·78	l 3·56	h 3·52	h 4·30	$w = 18{\cdot}90$
											$\frac{1}{w} = 0{\cdot}05$
	3·39	2·94	2·51	3·52	3·23	2·04	3·77	3·84	3·53	4·35	$C = 46° 34' 3''{\cdot}31$

NOTE.—Stations XXII and XXIII appertain to the Mangalore Meridional Series.

J. B. N. HENNESSEY,

In charge of Computing Office.

February 1882.

ADDENDUM.

The portion of this Series between Karanja-Mándvi and Pil-Kumbhári, exclusive of the connection from the east on Agoada-Salili, was executed with Dollond's 15-inch Theodolite read by 3 microscopes, on a system of zero-setting which merely required that the zeros should consist of 3 pairs removed 20° apart.

The system of zero-settings for an instrument of 5 microscopes, laid down for adoption in 1860 and explained at page 63 of Volume II, is

$$\frac{0^\circ\,0'}{180^\circ\,0'},\ \frac{79^\circ\,12'}{259^\circ\,12'},\ \frac{158^\circ\,24'}{338^\circ\,24'},\ \frac{237^\circ\,36'}{57^\circ\,36'}\ \text{and}\ \frac{316^\circ\,48'}{136^\circ\,48'}$$

this system was adopted during 1867 in the following instances when Barrow's 24-inch Theodolite No. 2 with 5 microscopes was used.

At XIII	angle between	XVIII	and XVII.
„ „	„ „	XIV	and XVII.
„ XIV	„ „	XVII	and XIII.
„ XVII	„ „	XIII	and XIV.
„ „	„ „	XIII	and XVIII.
„ „	„ „	XVIII	and XIX.

For the remaining angles *eastward* to the side Yalúr-Samshergad of the Mangalore Meridional Series, observed in 1866 with the same instrument as was used in 1867, the system erroneously adopted was

$$\frac{0^\circ\,0'}{180^\circ\,0'},\ \frac{43^\circ\,13'}{223^\circ\,13'},\ \frac{86^\circ\,24'}{266^\circ\,24'},\ \frac{129^\circ\,36'}{309^\circ\,36'}\ \text{and}\ \frac{172^\circ\,48'}{352^\circ\,48'}.$$

On page 20—C, at Station XVII *two* zero readings were made use of *on the same face*; the angular values obtained on each of the zeros are indicated *generally* on that page; a more precise statement is here added.

	Seconds of angle		
	XIII & XIV	XIII & XVIII	XVIII & XIX
On zero 64° 12′	*h* 50″·04 *h* 47 ·30	*h* 63″·78	
„ 64° 16′	*h* 47″·36	*h* 65″·14 *h* 62 ·46	*h* 21″·04 *h* 20 ·82

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In charge of Computing Office.

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In the calculations of the weights of the observed angles by the formula given in Section 4 of Chapter VII of Volume II and illustrated by an example in the foot note to page 342 of the same Volume, it is necessary to employ the squares of the *apparent* errors of observation and graduation. These data have been employed to 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 as follows:—

Dollond's 15-inch Theodolite, having 3 microscopes to read the azimuth circle; observations were taken on 3 pairs of zeros (*face right* and *face left*) giving circle readings at 20° apart.

Barrow's 24-inch Theodolite No. 2, having 5 microscopes to read the azimuth circle; observations were taken on 5 pairs of zeros (*face right* and *face left*) giving circle readings at 7° 12′ apart.

The *e.m.s. of observation* of a single measure of an angle $= \sqrt{\dfrac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$

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

Group	Observer and Instrument	Position of stations	Interval between microscope readings of circle	Number of: Measures on each zero (average)	Number of: Angles	Number of: Single measures	Number of: Single zeros	e. m. s. of observation of a single measure	e. m. s. of graduation and observation of a single zero
			° ′						
I	Lieutenant W. S. Jacob, Dollond's 15-inch Theodolite.	Hills,	20 0	2·32	13	181	78	$\left\{\frac{427\cdot75}{181-78}\right\}^{\frac{1}{2}} = \pm 2''\cdot038$	$\left\{\frac{1078\cdot84}{78-13}\right\}^{\frac{1}{2}} = \pm 4''\cdot074$
II	Lieutenant H. Rivers, Dollond's 15-inch Theodolite.	"	20 0	2·91	45	786	270	$\left\{\frac{2838\cdot31}{786-270}\right\}^{\frac{1}{2}} = \pm 2\cdot345$	$\left\{\frac{3796\cdot98}{270-45}\right\}^{\frac{1}{2}} = \pm 4\cdot108$
III	Lieutenant H. Trotter, Barrow's 24-inch Theodolite No. 2.	"	7 12	2·20	6	132	60	$\left\{\frac{138\cdot51}{132-60}\right\}^{\frac{1}{2}} = \pm 1\cdot387$	$\left\{\frac{80\cdot41}{60-6}\right\}^{\frac{1}{2}} = \pm 1\cdot220$
IV	Captain C. T. Haig, Barrow's 24-inch Theodolite No. 2.	"	7 12	2·00	12	240	120	$\left\{\frac{35\cdot66}{240-120}\right\}^{\frac{1}{2}} = \pm 0\cdot545$	$\left\{\frac{90\cdot73}{120-12}\right\}^{\frac{1}{2}} = \pm 0\cdot917$
I & II	Lieutenants W. S. Jacob, and H. Rivers, Dollond's 15-inch Theodolite.	"	20 0	2·78	58	967	348	$\left\{\frac{3266\cdot06}{967-348}\right\}^{\frac{1}{2}} = \pm 2\cdot297$	$\left\{\frac{4875\cdot82}{348-58}\right\}^{\frac{1}{2}} = \pm 4\cdot100$
III & IV	Lieutenant H. Trotter, and Captain C. T. Haig, Barrow's 24-inch Theodolite No. 2.	"	7 12	2·07	18	372	180	$\left\{\frac{174\cdot17}{372-180}\right\}^{\frac{1}{2}} = \pm 0\cdot952$	$\left\{\frac{171\cdot14}{180-18}\right\}^{\frac{1}{2}} = \pm 1\cdot028$

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SOUTH KONKAN COAST SERIES.

PRINCIPAL TRIANGULATION. REDUCTION OF FIGURES.

Figure No. 26.

Observed Angles

No.	Value	Reciprocal Weight
	° ′ ″	
1	50 57 30·85	2·48
2	37 57 7·14	1·69
3	40 2 51·52	3·79
4	51 2 39·20	4·90
5	44 10 40·23	1·59
6	44 43 55·13	1·14
7	44 32 57·20	3·38
8	46 32 35·81	4·37

Equations to be satisfied — **Factor**

$x_1 + x_2 + x_3 + x_4 = e_1 = -0·904,$ λ_1

$x_3 + x_4 + x_5 + x_6 = e_2 = -2·858,$ λ_2

$x_5 + x_6 + x_7 + x_8 = e_3 = +0·493,$ λ_3

$\left.\begin{matrix} -17x_1 + 4x_2 - 21x_3 \\ +20x_6 - x_7 + 20x_8 \end{matrix}\right\} = e_4 = +96·5,$ λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 0·904	+ 12·86	+ 8·69	...	− 114·99
2	− 2·858		+ 11·42	+ 2·73	− 56·79
3	+ 0·493		*	+ 10·48	+ 106·82
4	+ 96·5				+ 4622·53

Values of the Factors

$\lambda_1 = + ·5173$

$\lambda_2 = - ·4453$

$\lambda_3 = - ·1637$

$\lambda_4 = + ·0321$

Angular errors in seconds

$x_1 = - ·068$	$x_5 = - ·968$
$x_2 = +1·091$	$x_6 = + ·037$
$x_3 = -2·279$	$x_7 = - ·662$
$x_4 = + ·352$	$x_8 = +2·086$

$[wx^2] = 3·82$

* In the tables of the equations between the factors the co-efficients of the terms below the diagonal are omitted for convenience, the co-efficient of the *p*th term in the *q*th line being always the same as the co-efficient of the *q*th term in the *p*th line.

Figure No. 27.

Observed Angles

No.	Value			Reciprocal Weight
	°	′	″	
1	53	21	29·73	5·10
2	26	48	5·22	2·00
3	29	45	3·01	0·32
4	70	5	23·70	2·76
5	40	24	46·75	7·58
6	39	44	56·91	2·38
7	51	35	23·73	3·65
8	48	15	0·22	6·29

Equations to be satisfied — Factor

$x_1 + x_2 + x_3 + x_4 = e_1 = -4·866,$ λ_1

$x_3 + x_4 + x_5 + x_6 = e_2 = +5·519,$ λ_2

$x_5 + x_6 + x_7 + x_8 = e_3 = +4·118,$ λ_3

$\left.\begin{matrix} -16x_1 + 14x_2 - 23x_3 \\ +26x_6 + x_7 + 19x_8 \end{matrix}\right\} = e_4 = -128·7,$ λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 4·866	+10·18	+ 3·08	...	− 60·96
2	+ 5·519		+13·04	+ 9·96	+ 54·52
3	+ 4·118		*	+19·90	+ 185·04
4	−128·7				+ 5750·10

Values of the Factors

$\lambda_1 = -·9480$

$\lambda_2 = +·5527$

$\lambda_3 = +·4004$

$\lambda_4 = -·0506$

Angular errors in seconds

$x_1 = -·709$	$x_5 = +7·224$
$x_2 = -3·312$	$x_6 = -·860$
$x_3 = +·246$	$x_7 = +1·277$
$x_4 = -1·091$	$x_8 = -3·523$

$[wx^2] = 15·82$

Figure No. 28.

Observed Angles

No.	Value	Reciprocal Weight
	° ′ ″	
1	38 35 30·06	1·19
2	26 18 2·32	3·15
3	50 4 24·95	6·25
4	65 1 59·29	6·67
5	34 41 9·36	3·86
6	30 12 27·55	1·87
7	44 27 48·92	2·36
8	70 38 29·24	2·26

Equations to be satisfied

		Factor
$x_1 + x_2 + x_3 + x_4$	$= e_1 = -7·667,$	λ_1
$x_3 + x_4 + x_5 + x_6$	$= e_2 = -3·409,$	λ_2
$x_5 + x_6 + x_7 + x_8$	$= e_3 = -9·031,$	λ_3
$-26\,x_1 + 5\,x_2 - 13\,x_3 + 30\,x_6 - 6\,x_7 + 7\,x_8$	$= e_4 = -4·3,$	λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 7·667	+ 17·26	+ 12·92	...	− 96·44
2	− 3·409		+ 18·65	+ 5·73	− 25·15
3	− 9·031		*	+ 10·35	+ 57·76
4	− 4·3				+ 3818·14

Values of the Factors

$\lambda_1 = -1·4298$

$\lambda_2 = +1·2764$

$\lambda_3 = -1·5490$

$\lambda_4 = -·0054$

Angular errors in seconds

$x_1 = -1·535$	$x_5 = -1·053$
$x_2 = -4·589$	$x_6 = -·813$
$x_3 = -·520$	$x_7 = -3·579$
$x_4 = -1.023$	$x_8 = -3·586$

$[wx^2] = 20·62$

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SOUTH KONKAN COAST SERIES.

PRINCIPAL TRIANGULATION. TRIANGLES.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ' "			
25		XXXIV (Karanja)	2·661	+ ·214	+ ·226		+ ·440	59 30 3·039	5·3054821,0	202060·84	38·269
		XXXI (Mándvi)	2·661	+ ·083	− ·034		+ ·049	48 22 35·228	5·2437837,8	175300·76	33·201
		I (Titvi)	2·662	+ ·107	− ·192		− ·085	72 7 21·733	5·3486653,6	223185·19	42·270
			7·984				+ ·404	180 0 0·000			
26		XXXI (Mándvi)	2·052	−1·268	− ·013		−1·281	75 50 14·297	5·3280751,4	212850·71	40·313
		I (Titvi)	2·051	− ·576	+ ·346		− ·230	37 10 12·909	5·1226506,1	132632·69	25·120
		II (Torna)	2·051	−1·792	− ·333		−2·125	66 59 32·794	5·3054821,0	202060·84	38·269
			6·154				−3·636	180 0 0·000			
27		I (Titvi)	2·458	+ ·618	+ ·076		+ ·694	70 51 35·026	5·3390892,6	218317·87	41·348
		II (Torna)	2·457	+2·157	+ ·052		+2·209	42 3 30·862	5·1897902,2	154806·86	29·319
		III (Kanta)	2·458	+1·278	− ·128		+1·150	67 4 54·112	5·3280751,4	212850·71	40·313
			7·373				+4·053	180 0 0·000			
28		II (Torna)	2·038	− ·278	− ·120		− ·398	66 1 9·914	5·3087350,2	203579·96	38·557
		III (Kanta)	2·038	− ·152	+ ·259		+ ·107	35 30 29·699	5·1119810,1	129413·93	24·510
		IV (Mahábaleshvar)	2·038	− ·676	− ·139		− ·815	78 28 20·387	5·3390892,6	218317·87	41·348
			6·114				−1·106	180 0 0·000			
29		III (Kanta)	3·205	+1·188	− ·033		+1·155	77 59 56·610	5·4088952,7	256386·57	48·558
		IV (Mahábaleshvar)	3·205	− ·352	+ ·063		− ·289	51 2 35·706	5·3092602,6	203826·32	38·603
		V (Adhúr)	3·204	+ ·068	− ·030		+ ·038	50 57 27·684	5·3087350,2	203579·96	38·557
			9·614				+ ·904	180 0 0·000			

NOTE.—1. The values of the sides are given in the same lines with the opposite angles.
2. Stations XXXI (Mándvi) and XXXIV (Karanja) appertain to the Bombay Longitudinal Series.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
30		IV (Mahábaleshvar)	2·625	+ ·968	− ·294		+ ·674	44 10 38·279	5·2520880,8	178685·01	33·842
		V (Adhúr)	2·626	−2·086	+ ·246		−1·840	46 32 31·344	5·2697938,6	186120·37	35·250
		VI (Kumbhárli)	2·626	+ ·625	+ ·048		+ ·673	89 16 50·377	5·4088952,7	256386·57	48·558
			7·877				− ·493	180 0 0·000			
	330	III (Kanta)	2·979	+2·279		+ ·242	+2·521	40 2 51·062	5·2697938,6	186120·37	35·250
		IV (Mahábaleshvar)	2·980	+ ·616		− ·231	+ ·385	95 13 16·835	5·4594916,3	288065·75	54·558
		VI (Kumbhárli)	2·979	− ·037		− ·011	− ·048	44 43 52·103	5·3087350,2	203579·96	38·557
			8·938				+2·858	180 0 0·000			
31		V (Adhúr)	1·934	+1·029	− ·265		+ ·764	77 42 10·540	5·3060366,1	202318·98	38·318
		VI (Kumbhárli)	1·934	+ ·706	+ ·071		+ ·777	42 39 3·263	5·1470452,4	140295·98	26·571
		VII (Mirya)	1·934	+1·867	+ ·194		+2·061	59 38 46·197	5·2520880,8	178685·01	33·842
			5·802				+3·602	180 0 0·000			
32		VI (Kumbhárli)	2·514	+1·211	− ·577		+ ·634	59 52 39·850	5·2846239,5	192585·67	36·475
		VII (Mirya)	2·514	+1·479	+ ·202		+1·681	54 47 59·507	5·2599280,9	181939·95	34·458
		VIII (Manoli)	2·514	+ ·702	+ ·375		+1·077	65 19 20·643	5·3060366,1	202318·98	38·318
			7·542				+3·392	180 0 0·000			
33		VII (Mirya)	2·775	+1·300	− ·450		+ ·850	70 56 13·365	5·3497576,4	223747·24	42·376
		VIII (Manoli)	2·774	+1·201	+ ·057		+1·258	54 37 15·654	5·2855910,6	193015·00	36·556
		IX (Ghirya)	2·774	+ ·852	+ ·393		+1·245	54 26 30·981	5·2846239,5	192585·67	36·475
			8·323				+3·353	180 0 0·000			
34		VIII (Manoli)	2·625	+1·398	− ·748		+ ·650	53 56 30·445	5·2746823,1	188227·18	35·649
		IX (Ghirya)	2·625	+2·351	+ ·269		+2·620	52 7 3·715	5·2642732,6	183769·43	34·805
		X (Valvan)	2·625	+1·326	+ ·479		+1·805	73 56 25·840	5·3497576,4	223747·24	42·376
			7·875				+5·075	180 0 0·000			
35		IX (Ghirya)	2·670	− ·604	− ·685		−1·289	62 45 27·241	5·3086179,5	203525·09	38·546
		X (Valvan)	2·669	− ·240	+ ·112		− ·128	61 55 54·273	5·3053377,1	201993·63	38·256
		XI (Parule)	2·669	− ·368	+ ·573		+ ·205	55 18 38·486	5·2746823,1	188227·18	35·649
			8·008				−1·212	180 0 0·000			
36		X (Valvan)	2·299	− ·462	− ·960		−1·422	51 1 3·209	5·2248833,9	167835·32	31·787
		XI (Parule)	2·300	−2·490	+ ·191		−2·299	58 28 59·021	5·2649601,6	184060·32	34·860
		XII (Chaukola)	2·300	−2·189	+ ·769		−1·420	70 29 57·770	5·3086179,5	203525·09	38·546
			6·899				−5·141	180 0 0·000			
37		XI (Parule)	2·175	+3·066	−1·226		+1·840	56 33 7·895	5·2418706,4	174530·22	33·055
		XII (Chaukola)	2·176	+1·091	+ ·237		+1·328	70 5 22·852	5·2937350,9	196668·64	37·248
		XIII (Agoada)	2·175	+ ·709	+ ·989		+1·698	53 21 29·253	5·2248833,9	167835·32	31·787
			6·526				+4·866	180 0 0·000			
38		XII (Chaukola)	1·164	−7·224	−1·380		−8·604	40 24 36·982	5·0537360,8	113171·24	21·434
		XIII (Agoada)	1·164	+3·523	+ ·619		+4·142	48 15 3·198	5·1147674,8	130246·93	24·668
		XIV (Salili)	1·164	− ·417	+ ·761		+ ·344	91 20 19·820	5·2418706,4	174530·22	33·055
			3·492				−4·118	180 0 0·000			
	331	XI (Parule)	1·617	− ·246		+ ·145	− ·101	29 45 1·292	5·1147674,8	130246·93	24·668
		XII (Chaukola)	1·617	−6·133		−1·143	−7·276	110 30 1·557	5·3906779,1	245854·36	46·563
		XIV (Salili)	1·617	+ ·860		+ ·998	+1·858	39 44 57·151	5·2248833,9	167835·32	31·787
			4·851				−5·519	180 0 0·000			
	332	XIII (Agoada)	1·429	+5·109		* − ·034	+5·075	76 22 30·916	5·2463173,9	176326·42	33·395
		XIV (Salili)	1·429	+1·023		− ·003	+1·020	65 1 58·881	5·2161063,1	164477·43	31·151
		XV (Pil)	1·429	+1·535		+ ·037	+1·572	38 35 30·203	5·0537360,8	113171·24	21·434
			4·287				+7·667	180 0 0·000			

* Corrections to eliminate a residual difference of 33 in the 8th place of log. side XIV–XVI in triangles Nos. 333 and 334.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ' "			
	333	XIV (Salili)	1·367	+1·053		+ ·003	+1·056	34 41 9·049	5·0172177,8	104044·18	19·705
		XV (Pil)	1·367	+3·586		− ·037	+3·549	70 38 31·422	5·2367736,3	172493·86	32·669
		XVI (Kumbhári)	1·367	+4·392		+ ·034	+4·426	74 40 19·529	5·2463173,9	176326·42	33·395
			4·101				+9·031	180 0 0·000			
	334	XIII (Agoada)	1·520	+ ·520		+ ·034	+ ·554	50 4 23·984	5·2367736,3	172493·86	32·669
		XIV (Salili)	1·520	+2·076		·000	+2·076	99 43 9·206	5·3457752,0	221704·85	41·990
		XVI (Kumbhári)	1·519	+ ·813		− ·034	+ ·779	30 12 26·810	5·0537360,8	113171·24	21·434
			4·559				+3·409	180 0 0·000			
39		XIV (Salili)	·668	− ·080	− ·038		− ·118	64 58 3·094	5·0342889,8	108215·38	20·495
		XIII (Agoada)	·668	− ·048	− ·005		− ·053	43 40 9·789	4·9162892,4	82468·72	15·619
		XVII (Bori)	·668	− ·108	+ ·043		− ·065	71 21 47·117	5·0537360,8	113171·24	21·434
			2·004				− ·236	180 0 0·000			
40		XIII (Agoada)	·731	+ ·088	− ·087		+ ·001	45 3 33·400	4·9471740,7	88547·03	16·770
		XVII (Bori)	·732	+ ·078	− ·001		+ ·077	75 3 2·145	5·0822866,0	120861·11	22·890
		XVIII (Jarma)	·731	+ ·138	+ ·088		+ ·226	59 53 24·455	5·0342889,8	108215·38	20·495
			2·194				+ ·304	180 0 0·000			
41		XVII (Bori)	·464	− ·105	− ·047		− ·152	40 36 20·974	4·8282218,9	67332·06	12·752
		XVIII (Jarma)	·465	− ·046	+ ·016		− ·030	80 31 56·855	5·0087838,1	102043·15	19·326
		XIX (Darsinga)	·464	− ·046	+ ·031		− ·015	58 51 42·171	4·9471740,7	88547·03	16·770
			1·393				− ·197	180 0 0·000			
42		XVIII (Jarma)	·430	− ·186	− ·031		− ·217	56 20 41·373	4·9140203,4	82038·99	15·538
		XIX (Darsinga)	·431	− ·041	− ·016		− ·057	80 33 48·552	4·9877774,9	97224·89	18·414
		XX (Bailúr)	·430	− ·052	+ ·047		− ·005	43 5 30·075	4·8282218,9	67332·06	12·752
			1·291				− ·279	180 0 0·000			
43		XIX (Darsinga)	·532	− ·434	− ·027		− ·461	67 37 1·137	4·9783654,3	95140·51	18·019
		XX (Bailúr)	·531	− ·530	+ ·007		− ·523	59 30 26·666	4·9477372,9	88661·96	16·792
		XXIII (Samshergad)	·531	− ·482	+ ·020		− ·462	52 52 32·197	4·9140203,4	82038·99	15·538
			1·594				−1·446	180 0 0·000			
44		XX (Bailúr)	·382	− ·004	− ·022		− ·026	47 9 51·482	4·8445727,3	69915·38	13·242
		XXIII (Samshergad)	·381	− ·003	·000		− ·003	46 34 2·926	4·8403343,2	69236·37	13·113
		XXII (Yalúr)	·382	− ·008	+ ·022		+ ·014	86 16 5·592	4·9783654,3	95140·51	18·019
			1·145				− ·015	180 0 0·000			

Note.—Stations XXII (Yalúr) and XXIII (Samshergad) appertain to the Mangalore Meridional Series.

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In charge of Computing Office.

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SOUTH KONKAN COAST SERIES.

PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	XXXI (Mándvi)	18 37 51·11	73 34 48·89	111 40 40·43	5·3486653,6	291 29 6·38	XXXIV (Karanja)
	" "	"	"	63 18 2·54	5·3054821,0	243 8 7·53	I (Titvi)
	" "	"	"	347 27 46·19	5·1226506,1	167 29 20·77	II (Torna)
13	XXXIV (Karanja)	18 51 24·99	72 58 49·06	350 59 12·08	5·2437837,8	171 0 43·14	I (Titvi)
14	I (Titvi)	18 22 48·44	73 3 34·26	280 18 22·49	5·3280751,4	100 29 45·92	II (Torna)
"	" "	"	"	351 9 59·98	5·1897902,2	171 11 16·77	III (Kanta)
	II (Torna)	18 16 27·44	73 39 47·70	58 26 12·60	5·3390892,6	238 16 13·34	" "
	" "	"	"	352 25 0·65	5·1119810,1	172 25 55·60	IV (Mahábaleshvar)
15	III (Kanta)	17 57 31·75	73 7 40·54	273 46 45·08	5·3087350,2	93 57 33·17	" "
"	" "	"	"	351 46 44·89	5·3092602,6	171 48 16·32	V (Adhúr)
"	" "	"	"	313 49 39·12	5·4594916,3	134 0 31·13	VI (Kumbhárli)
	IV (Mahábaleshvar)	17 55 15·55	73 42 44·59	42 54 54·26	5·4088952,7	222 45 47·21	V (Adhúr)
	" "	"	"	358 44 13·36	5·2697938,6	178 44 26·21	VI (Kumbhárli)
16	V (Adhúr)	17 24 11·50	73 12 41·55	269 18 21·18	5·2520880,8	89 27 33·21	" "
"	" "	"	"	347 0 33·65	5·1470452,4	167 2 9·85	VII (Mirya)
	VI (Kumbhárli)	17 24 30·59	73 43 26·96	46 48 28·01	5·3060366,1	226 40 57·99	" "
	" "	"	"	346 55 45·65	5·2599280,9	166 57 50·74	VIII (Manoli)
17	VII (Mirya)	17 1 35·92	73 18 6·61	281 29 0·01	5·2846239,5	101 38 27·58	" "
"	" "	"	"	352 25 16·15	5·2855910,6	172 26 31·62	IX (Ghirya)
	VIII (Manoli)	16 55 13·17	73 50 30·82	47 1 9·15	5·3497576,4	226 53 5·37	" "

Note.—Stations XXXI (Mándvi) and XXXIV (Karanja) appertain to the Bombay Longitudinal Series.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ' "	° ' "	° ' "		° ' "	
	VIII (Manoli)	16 55 13·17	73 50 30·82	353 4 36·08	5·2642732,6	173 5 41·37	X (Valvan)
18	IX (Ghirya)	16 29 58·66	73 22 28·28	279 0 11·71	5·2746823,1	99 9 12·91	" "
"	" "	"	"	341 45 41·62	5·3053377,1	161 48 42·82	XI (Parule)
	X (Valvan)	16 25 4·15	73 54 18·42	37 13 15·96	5·3086179,5	217 7 23·97	" "
	" "	"	"	346 12 10·46	5·2649601,6	166 14 15·76	XII (Chaukola)
19	XI (Parule)	15 58 15·95	73 33 16·35	275 36 25·29	5·2248833,9	95 44 15·69	" "
"	" "	"	"	332 9 35·36	5·2937350,9	152 13 50·05	XIII (Agoada)
"	" "	"	"	305 21 28·20	5·3906779,1	125 30 45·94	XIV (Salili)
	XII (Chaukola)	15 55 31·44	74 1 48·31	25 38 50·66	5·2418706,4	205 35 21·48	XIII (Agoada)
	" "	"	"	345 14 12·51	5·1147674,8	165 15 44·70	XIV (Salili)
20	XIII (Agoada)	15 29 30·78	73 48 55·70	253 50 25·84	5·0537360,8	73 55 23·72	" "
"	" "	"	"	330 12 58·18	5·2161063,1	150 16 38·20	XV (Pil)
"	" "	"	"	303 54 51·34	5·3457752,0	124 3 7·75	XVI (Kumbhári)
"	" "	"	"	297 30 36·30	5·0342889,8	117 34 57·18	XVII (Bori)
"	" "	"	"	252 27 2·17	5·0822866,0	72 32 18·11	XVIII (Jarma)
	XIV (Salili)	15 34 42·36	74 7 27·90	8 53 23·41	5·2463173,9	188 52 9·83	XV (Pil)
	" "	"	"	334 12 12·99	5·2367736,3	154 15 36·08	XVI (Kumbhári)
	" "	"	"	8 57 19·96	4·9162892,4	188 56 44·97	XVII (Bori)
	XV (Pil)	15 5 54·64	74 2 49·74	259 30 42·62	5·0172177,8	79 35 15·18	XVI (Kumbhári)
	XVI (Kumbhári)	15 9 1·80	74 20 14·38				
21	XVII (Bori)	15 21 14·47	74 5 16·69	192 38 0·06	4·9471740,7	12 38 52·93	XVIII (Jarma)
"	" "	"	"	233 14 21·50	5·0087838,1	53 18 4·10	XIX (Darsinga)
	XVIII (Jarma)	15 35 31·32	74 8 34·85	292 6 55·61	4·8282218,9	112 9 46·74	" "
	" "	"	"	235 46 13·80	4·9877774,9	55 49 56·09	XX (Bailúr)
22	XIX (Darsinga)	15 31 19·67	74 19 12·92	192 43 35·72	4·9140203,4	12 44 25·59	" "
"	" "	"	"	260 20 37·39	4·9477372,9	80 24 37·01	XXIII (Samshergad)
	XX (Bailúr)	15 44 33·25	74 22 17·99	266 4 6·53	4·8403343,2	86 7 18·52	XXII (Yalúr)
	" "	"	"	313 13 58·39	4·9783654,3	133 17 9·74	XXIII (Samshergad)
31	XXII (Yalúr)	15 45 20·01	74 34 5·35	359 51 12·55	4·8445727,3	179 51 13·04	" "
32	XXIII (Samshergad)	15 33 46·66	74 34 7·18				

Note.—Stations XXII (Yalúr) and XXIII (Samshergad) appertain to the Mangalore Meridional Series.

W. H. COLE,
In charge of Computing Office.

June, 1889.

SOUTH KONKAN COAST SERIES.

PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.

The following table gives, first, the usual data of the observed vertical angles and the heights of the signal and instrument, &c., in pairs of horizontal lines, the first line of which gives the data for the 1st or the fixed station, and the second line the data for the 2nd or the deduced station. This is followed by the arc contained between the two stations, and then by the terrestrial refraction and the height of the 2nd station above or below the 1st, as computed from the vertical angles in the usual manner. This difference of height applied to the given height above mean sea level of the fixed station, gives that of the deduced station. Usually there are two or three independent values of the height of the deduced station; the details are so arranged as to show these consecutively and their mean in the columns of "Trigonometrical Results." The mean results thus obtained are however liable to receive corrections for the errors generated in the trigonometrical operations, which are shown up by the spirit levelling operations, wherever a junction between the two has been effected. The spirit levelled determinations are always accepted as final, and the trigonometrical heights of stations lying between those fixed by the levelling operations are adjusted by simple proportion to accord with the latter. In the table the spirit levelled values are printed thus, **261·50**, &c., to distinguish them from the adjusted trigonometrical values. The column in which the mean trigonometrical heights are given is barred across where necessary, as after deduction of Stn. XIII from Stn. XII, page 36—c., to indicate that one set of adjustments ends and another begins. The trigonometrical heights always refer to the upper mark or to the upper surface of the pillar or structure on which the theodolite stood; when a spirit levelled height does not refer to either of these surfaces, it is given in combination with a correction, thus $\left\{\begin{matrix}\mathbf{261{\cdot}50}\\ -5{\cdot}0\end{matrix}\right.$, and the sum of these two quantities, in this case 256·50, represents the value with which the corresponding trigonometrical mean height 239·9 is comparable. Descriptions follow these tables, exactly indicating the surfaces on which the levelling staff stood during the determinations of the spirit levelled heights.

When the pillar of the station is perforated, the height given in the last column is that between the upper surface of pillar and the ground level mark-stone in the floor of the passage; otherwise, it is the approximate height of the structure above the ground at the base of the station.

The heights of the initial stations above Mean Sea Level are taken from the Bombay Longitudinal Series and are as follows:—

XXXI (Mándvi) 4120·8 feet; XXXIV (Karanja) 997·1 feet.

Astronomical Date 1885		Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
		h m		° ′ ″				″							feet
Dec.	6,7	1 46	XXXI (Mándvi)	D 1 1 57·2	36	1·7	5·0	1997	145	·073	−2802·9	1317·9	1317·0	1318	0
„	6,7	1 34	I (Titvi)	E 0 33 23·9	28	1·8	5·1								
Nov.	29	1 57	XXXIV (Karanja)	D 0 6 17·6	20	2·3	5·1	1732	116	·067	+ 319·0	1316·1			
Dec.	7,8	1 57	I (Titvi)	D 0 18 45·5	20	4·5	5·1								

Note.—Stations XXXI (Mándvi) and XXXIV (Karanja) appertain to the Bombay Longitudinal Series.

Astronomical Date 1885-86	Astronomical Date: Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Nov.27,28,29	1 46	XXXI (Mándvi)	E 0 2 51·5	32	2·0	5·0	1310	85	·065	+ 480·2	4601·0			
Dec. 13,15	1 46	II (Torna)	D 0 21 58·2	16	4·2	5·0						4601·7	4604	0
„ 13	1 54	I (Titvi)	E 0 37 57·0	16	2·1	5·1	2103	149	·071	+3285·4	4602·4			
„ 13	1 57	II (Torna)	D 1 8 9·3	16	1·7	5·0								
„ 10	2 11	I (Titvi)	D 0 15 20·1	12	2·1	5·1	1530	97	·063	− 186·4	1130·6			
„ 20	2 14	III (Kanta)	D 0 6 59·6	12	4·6	4·6						1130·1	1134	3·5
„ 18,19	1 29	II (Torna)	D 1 10 13·9	24	0·5	5·0	2157	148	·069	−3472·1	1129·6			
„ 18,19	1 45	III (Kanta)	E 0 39 7·0	24	2·1	4·6								
„ 15,18	1 50	II (Torna)	D 0 6 15·8	12	2·0	5·0	1279	84	·066	+ 115·8	4717·5			
Jan. 5,6,7	1 49	IV (Mahábaleshvar)	D 0 12 20·1	24	5·0	5·0						4714·2	4719	4·5
„ 5	1 52	III (Kanta)	E 0 45 55·7	16	2·0	4·6	2012	137	·068	+3580·7	4710·8			
„ 5	1 50	IV (Mahábaleshvar)	D 1 14 59·5	16	1·7	5·0								
„ 20,21	2 11	III (Kanta)	D 0 27 15·6	20	4·2	4·6	2014	139	·069	− 758·1	372·0			
„ 10,12	2 6	V (Adhúr)	D 0 1 44·9	16	1·3	5·1								
„ 9	1 42	IV (Mahábaleshvar)	D 1 16 30·6	16	1·9	5·0	2534	170	·067	−4341·0	373·2	373·7	380	1·1
„ 9	2 7	V (Adhúr)	E 0 39 52·3	16	2·0	5·1								
„ 16	1 53	VI (Kumbhárli)	D 1 11 40·8	20	1·9	5·4	1766	122	·069	−3064·1	375·8			
„ 16	1 48	V (Adhúr)	E 0 46 11·4	16	1·0	5·1								
„ 21	1 56	III (Kanta)	E 0 7 5·5	16	1·0	4·6	2847	201	·071	+2306·4	3436·5			
„ 21	1 45	VI (Kumbhárli)	D 0 47 57·1	20	1·7	5·4								
„ 5,6,7	1 46	IV (Mahábaleshvar)	D 0 36 56·7	24	1·9	5·0	1839	115	·063	−1270·9	3443·3	3438·8	3445	2·5
„ 18,19	1 48	VI (Kumbhárli)	E 0 10 2·1	24	4·4	5·4								
„ 16	1 48	V (Adhúr)	E 0 46 11·4	16	1·0	5·1	1766	122	·069	+3064·1	3436·7			
„ 16	1 53	VI (Kumbhárli)	D 1 11 40·8	20	1·9	5·4								
„ 13,14	1 47	V (Adhúr)	D 0 7 50·7	18	1·8	5·1	1387	92	·066	+ 92·6	466·3			
„ 27	1 50	VII (Mirya)	D 0 12 19·5	16	4·2	5·1						465·7	473	0
„ 26	1 55	VI (Kumbhárli)	D 1 4 57·8	20	2·1	5·4	2000	137	·069	−2973·8	465·0			
„ 26	1 53	VII (Mirya)	E 0 36 4·2	16	1·2	5·1								
„ 18,19	1 38	VI (Kumbhárli)	D 0 14 53·6	24	1·4	5·4	1798	108	·060	− 86·6	3352·2			
Feb. 3,4,5	1 42	VIII (Manoli)	D 0 11 34·0	28	4·2	5·4						3353·5	3362	3·5
„ 2,3	1 37	VII (Mirya)	E 0 37 59·0	24	2·0	5·1	1903	140	·074	+2889·0	3354·7			
„ 2,3	1 43	VIII (Manoli)	D 1 5 8·7	32	2·1	5·4								
Jan. 30,31	1 55	VII (Mirya)	D 0 16 16·8	24	3·2	5·1	1907	131	·069	− 142·1	323·6			
Feb.10,11,12	1 51	IX (Ghirya)	D 0 11 11·5	44	4·8	5·1						322·1	332	0
„ 9	1 50	VIII (Manoli)	D 1 2 32·2	24	2·7	5·4	2211	152	·069	−3033·0	320·5			
„ 9	1 42	IX (Ghirya)	E 0 30 38·4	12	2·0	5·1								

Note.—Station XXXI (Mándvi) appertains to the Bombay Longitudinal Series.

Astronomical Date 1886	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Feb. 3, 4, 5, 6	2 13	VIII (Manoli)	D 0 15 27·4	16	2·2	5·4	1816	113	·062	− 114·2	3239·3	3238·1	3250	0
„ 17, 18	1 46	X (Valvan)	D 0 11 9·1	20	4·3	5·7								
„ 17	1 48	IX (Ghirya)	E 0 39 57·5	20	2·2	5·1	1860	137	·074	+ 2914·7	3236·8			
„ 17	1 47	X (Valvan)	D 1 6 29·6	16	2·7	5·7								
„ 18	1 55	IX (Ghirya)	D 0 5 24·0	12	1·7	5·1	929	42	·045	+ 48·7	370·8	372·9	386	1
„ 24, 25	1 34	* Bhutoba	D 0 8 52·6	10	4·1	5·1								
„ 24	1 42	X (Valvan)	D 1 12 3·3	24	2·0	5·7	1611	107	·066	− 2863·1	375·0			
„ 24	1 45	Bhutoba	E 0 48 38·3	12	2·2	5·1								
Mar. 3	1 41	X (Valvan)	D 1 0 31·6	24	7·5	5·7	2012	137	·068	− 2728·7	509·4	508·4	522	0
„ 3	1 42	XI (Parule)	E 0 31 28·0	20	2·2	10·5								
Feb. 25	1 28	Bhutoba	D 0 3 36·3	12	7·6	5·1	1070	58	·054	+ 134·5	507·4			
„ 28, Mar. 1	1 32	XI (Parule)	D 0 12 26·3	24	4·1	10·5								
„ 17, 18, 19	1 38	X (Valvan)	D 0 21 57·7	32	1·7	5·7	1819	111	·061	− 458·7	2779·4	2778·4	2794	2·1
Mar. 9, 10, 11	1 43	XII (Chaukola)	D 0 4 45·7	36	4·6	5·0								
„ 9, 10	1 41	XI (Parule)	E 0 34 26·4	40	2·8	10·5	1658	117	·071	+ 2269·0	2777·4			
„ 9, 10	1 35	XII (Chaukola)	D 0 58 17·2	36	7·5	5·0								
„ 26, 30	2 4	XI (Parule)	D 0 18 58·4	20	5·6	10·5	1944	120	·062	− 268·2	240·2	239·9	261·50 − 5·0	†
„ 15, 16, 17	1 49	XIII (Agoada)	D 0 9 28·8	24	7·0	5·2								
„ 13, 15	1 39	XII (Chaukola)	D 1 2 25·3	32	5·6	5·0	1725	117	·068	− 2538·9	239·5			
„ 13, 15	1 51	XIII (Agoada)	E 0 37 31·1	24	2·8	5·2								
„ 16, 17, 22	1 35	XIII (Agoada)	E 0 15 37·4	26	1·7	5·2	1625	108	·066	+ 1313·4	1569·9	1569·9	1571·56 − 3·5	1·7
Apr. 16	1 35	XV (Pil)	D 0 39 11·4	16	5·6	5·1								
Mar. 26, 27	1 43	XI (Parule)	E 0 3 16·5	28	1·7	10·5	2429	162	·067	+ 1498·7	2021·1	2022·8	2023	3
„ 26, 27	1 41	XIV (Salili)	D 0 38 28·4	22	7·5	5·0								
„ 11, 12, 13	1 48	XII (Chaukola)	D 0 29 54·0	48	1·7	5·0	1287	77	·060	− 771·6	2022·1			
„ 22, 23, 24	1 46	XIV (Salili)	E 0 10 54·1	48	4·6	5·0								
(1)	2 20	XIII (Agoada)	E 0 45 38·9	28	2·2	5·3	1118	83	·074	+ 1767·7	2024·2			
(2)	2 15	XIV (Salili)	D 1 1 39·7	20	4·1	5·2								
Apr. 11	1 54	XV (Pil)	D 0 3 46·9	24	1·7	5·1	1743	116	·067	+ 455·8	2023·9			
„ 11	1 52	XIV (Salili)	D 0 21 33·1	24	1·7	5·1								
„ 22	1 55	XIII (Agoada)	E 0 25 9·7	16	1·6	4·8	2191	150	·068	+ 2643·2	2899·7	2897·8	2898	2·5
„ 22	1 50	XVI (Kumbhári)	D 0 56 44·4	16	5·7	5·3								
Mar. 25, 26, 27, 28	1 47	XIV (Salili)	E 0 5 9·8	44	1·3	5·0	1705	125	·073	+ 872·3	2895·1			
Apr. 18, 19	1 41	XVI (Kumbhári)	D 0 29 32·5	30	4·1	5·0								
„ 18	1 44	XV (Pil)	E 0 36 23·9	24	1·9	5·1	1028	66	·064	+ 1330·6	2898·7			
„ 18	1 37	XVI (Kumbhári)	D 0 51 31·1	16	1·7	5·0								

* This is an auxiliary station for the determination of height only, and its data are not published in this Volume. † See description of this station, page 5—c. (1) Mean of observations taken on 27th February, 1866, and 22nd March, 1886. (2) Mean of observations taken on 26th February, 1866, and 22nd March, 1886.

Astronomical Date 1866	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Feb. 27	3 4	XIII (Agoada)	E 0 51 45·5	4	2·7	5·3	1195	95	·079	+2117·0	2373·5	2376·8	2378	*
„ 24	2 47	XVIII (Jarma)	D 1 8 39·5	4	2·6	5·3								
„ 26	2 25	XIV (Salili)	E 2 28 1·7	4	2·7	5·3	81	5	·056	+ 357·2	2380·0			
„ 24	2 37	XVIII (Jarma)	D 2 31 25·8	4	2·6	5·3								
1867 Jan. 28	2 15	XIV (Salili)	D 0 34 16·2	8	2·8	5·3	815	55	·067	− 678·6	1344·2	1341·3	1344	4
„ 22	2 49	XVII (Bori)	E 0 22 17·7	8	2·6	5·3								
1866 Feb. 23	2 40	XVIII (Jarma)	D 0 46 41·2	2	2·3	5·3	875	62	·072	−1038·4	1338·4			
1867 Jan. 22	2 55	XVII (Bori)	E 0 33 56·5	10	2·6	5·3								
„ 22	3 3	XVII (Bori)	E 1 0 46·3	8	2·6	5·3	1009	76	·075	+2019·2	3360·5	3358·6	3363	0
1866 Feb. 19	2 49	XIX (Darsinga)	D 1 15 14·5	4	2·6	5·3								
„ 23,24	2 31	XVIII (Jarma)	E 0 45 7·8	8	2·6	5·3	666	48	·072	+ 979·8	3356·6			
„ 19	2 43	XIX (Darsinga)	D 0 54 53·9	4	2·6	5·3								
„ 23,24	2 19	XVIII (Jarma)	E 0 29 1·6	8	2·6	5·3	961	59	·062	+1022·6	3399·4	3399·3	3405	5
„ 12	3 0	XX (Bailúr)	D 0 43 16·2	4	2·6	5·3								
„ 19	2 29	XIX (Darsinga)	D 0 4 21·7	4	2·6	5·3	811	49	·060	+ 40·5	3399·1			
„ 12	2 53	XX (Bailúr)	D 0 7 45·2	4	2·6	5·3								
„ 19	2 21	XIX (Darsinga)	D 0 20 46·9	4	2·6	5·3	877	51	·058	− 366·9	2991·7	2992·2	2999	*
„ 15	2 53	XXIII (Samshergad)	E 0 7 40·6	4	2·8	5·3								
„ 8,12	2 43	XX (Bailúr)	D 0 21 36·4	8	2·6	5·3	941	61	·065	− 406·6	2992·7			
Jan. 31, Feb. 1	2 41	XXIII (Samshergad)	E 0 7 46·4	8	2·6	5·3								
Feb. 8,12	2 35	XX (Bailúr)	D 0 11 15·2	8	2·7	5·3	685	41	·060	− 123·0	3276·3	3275·8	3283	6
„ 2,3	2 49	XXII (Yalúr)	E 0 0 57·2	8	2·6	5·3								
Jan. 31, Feb. 1	2 34	XXIII (Samshergad)	E 0 8 46·4	8	2·7	5·3	693	45	·065	+ 283·1	3275·3			
Feb. 2,3	2 41	XXII (Yalúr)	D 0 19 4·6	8	2·6	5·3								

NOTE.—Stations XXII (Yalúr) and XXIII (Samshergad) appertain to the Mangalore Meridional Series. * Not forthcoming.

Description of Spirit-levelled Points.

When determining the Spirit-levelled heights, given on page 36—C., the levelling staff stood on the surfaces hereafter described.

XIII (Agoada) ... ... Within the circle on the top of the circular protecting pillar.

XV (Pil) ... ... On the intersection of the cross lines on the top of the rectangular protecting pillar.

For further particulars of these stations, see page 5—C.

June, 1889.

W. H. COLE,
In charge of Computing Office.

SOUTH KONKAN COAST SERIES.

PRINCIPAL TRIANGULATION. AZIMUTHAL OBSERVATIONS.

At VII (Mirya)

Lat. N. 17° 1′ 35″·92; Long. E. 73° 18′ 6″·61 = $4^h\ 53^m\ 12^s{\cdot}4$; Height above Mean Sea Level, 473 feet.
October 1844; observed by Lieutenant H. Rivers with Dollond's 15-inch Theodolite.

Star observed	*a* Ursæ Minoris (East and West).
Mean Right Ascension 1844·0	$1^h\ 3^m\ 18^s$
Mean North Polar Distance 1844·0	1° 31′ 20″·44
Local Mean Times of Elongation, October 22	Eastern $5^h\ 2^m$; Western 16 57

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Oct. 22	E.	10 0	+ 3 23 28·00	2 26	− 0 0·32	+ 3 23 27·68	+ 3 23 41·33	20 0	− 0 21·71	+ 3 23 19·62
		&	23 26·33	5 7	0 1·42	24·91	23 51·33	22 10	0 26·69	24·64
		189 59	23 29·00	13 37	0 10·07	18·93	24 16·33	31 41	0 54·46	21·87
			23 38·33	16 38	0 15·00	23·33	24 19·66	33 22	1 0·41	19·25
			27 27·67	68 2	4 9·98	17·69	24 31·00	35 41	1 9·04	21·96
			27 45·33	70 23	4 27·49	17·84	26 23·67	58 12	3 3·28	20·39
„ 22	W.	10 0	+ 6 33 4·33	24 21	+ 0 32·14	+ 6 33 36·47	+ 6 31 38·67	44 17	+ 1 45·91	+ 6 33 24·58
		&	33 3·67	25 50	0 36·13	39·80	30 44·66	53 31	2 34·47	19·13
		189 59	32 53·00	27 6	0 39·77	32·77				
„ 23	E.	30 0	+ 3 23 29·67	15 57	− 0 13·80	+ 3 23 15·87	+ 3 23 19·66	3 19	− 0 0·60	+ 3 23 19·06
		&	23 54·34	24 3	0 31·40	22·94	23 20·00	5 55	0 1·90	18·10
		210 0	24 4·00	25 54	0 36·42	27·58	23 23·67	7 56	0 3·42	20·25
			24 14·33	27 51	0 42·07	32·26	23 23·00	8 41	0 4·10	18·90
							24 43·00	37 58	1 18·19	24·81
							24 52·66	40 43	1 29·87	22·79
„ 23	W.	30 0	+ 6 33 13·67	19 2	+ 0 19·66	+ 6 33 33·33	+ 6 32 7·00	40 23	+ 1 28·44	+ 6 33 35·44
		&	32 47·67	27 42	0 41·55	29·22	32 14·34	38 18	1 19·54	33·88
		210 0	32 45·33	30 16	0 49·61	34·94				
			32 32·67	31 29	0 53·68	26·35				
			32 30·00	35 35	1 8·51	38·51				

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Oct. 24	E.	50 0	+ 3 23 55·33	25 32	− 0 35·39	+ 3 23 19·94	+ 3 24 32·00	35 49	− 1 9·56	+ 3 23 22·44
		&	23 52·34	26 41	0 38·66	13·68	24 36·00	36 51	1 13·64	22·36
		230 0	23 54·34	28 2	0 42·62	11·72	24 38·33	37 59	1 18·25	20·08
			27 34·66	69 4	4 17·63	17·03	24 39·00	38 58	1 22·36	16·64
			27 40·66	70 13	4 26·26	14·40	24 47·00	41 0	1 31·11	15·89
„ 24	W.	50 0	+ 6 32 12·66	35 11	+ 1 7·12	+ 6 33 19·78	+ 6 33 29·66	0 27	+ 0 0·01	+ 6 33 29·67
		&	33 3·67	17 50	0 17·26	20·93	33 29·66	1 11	0 0·08	29·74
		230 0	33 4·33	16 31	0 14·80	19·13	33 29·00	2 17	0 0·29	29·29
			33 5·00	15 20	0 12·78	17·78	33 29·00	3 18	0 0·59	29·59
			33 7·66	14 17	0 11·08	18·74	33 28·33	4 17	0 0·99	29·32
			33 8·00	12 56	0 9·08	17·08	33 28·00	5 20	0 1·54	29·54
„ 24	W.	190 0	...	...	...	...	+ 6 32 19·34	35 41	+ 1 8·88	+ 6 33 28·22
			...	...	...	...	31 36·00	44 54	1 48·94	24·94

Abstract of Astronomical Azimuth observed at VII (Mirya) 1844.

1. By Eastern Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R
Zero	10°	190°	30°	210°	50°	230°
Date	October 22		October 23		October 24	
	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	27·68	19·62	15·87	19·06	19·94	22·44
	24·91	24·64	22·94	18·10	13·68	22·36
	18·93	21·87	27·58	20·25	11·72	20·08
	23·33	19·25	32·26	18·90	17·03	16·64
	17·69	21·96		24·81	14·40	15·89
	17·84	20·39		22·79		
Means	21·73	21·29	24·66	20·65	15·35	19·48
	° ′ ″		″		″	
Means of both faces	+ 3 23 21·51		22·66		17·41	
Az. of Star fr. S., by W.	181 35 4·90		4·52		4·15	
Az. of Ref. M. „	184 58 26·41		27·18		21·56	

Abstract of Astronomical Azimuth observed at VII (Mirya) 1844—(*Continued*).

2. By Western Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R
Zero	10°	190°	30°	210°	50°	230°
Date	October 22		October 23		October 24	
	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	36·47 39·80 32·77	24·58 19·13 *28·97 *25·69	33·33 29·22 34·94 26·35 38·51	35·44 33·88	19·78 20·93 19·13 17·78 18·74 17·08	29·67 29·74 29·29 29·59 29·32 29·54
Means	36·35	24·59	32·47	34·66	18·91	29·53
	° ′ "		"		"	
Means of both faces	+ 6 33 30·47		33·57		24·22	
Az. of Star fr. S., by W.	178 24 55·29		55·66		56·04	
Az. of Ref. M. ,,	184 58 25·76		29·23		20·26	

		°	′	"
Astronomical Azimuth of Referring Mark ... by Eastern Elongation		184	58	25·05
Astronomical Azimuth of Referring Mark ... by Western ,, ...			,,	25·08
Astronomical Azimuth of Referring Mark ... Mean			,,	25·07
Angle Referring Mark and V (Adhúr) *see page* 12—c. *ante*	−	17	56	13·96
Astronomical Azimuth of Adhúr by observation		167	2	11·11
Geodetical Azimuth of ,, by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 32—c. *ante*		167	2	9·85
Astronomical — Geodetical Azimuth at VII (Mirya)	+			1·26

NOTE.—Where observations occurred on the same pair of zeros on different nights they are reduced in this abstract to one date—the most convenient—by allowing for star's change of place. The date so adopted appears at the head of the column, and the reduced observation is preceded by an asterisk.

At XII (Chaukola)

Lat. N. 15° 55′ 31″·44; Long. E. 74° 1′ 48″·31 = 4^h 56^m 7^s·2; Height above Mean Sea Level, 2794 feet.
December 1843; observed by Lieutenant H. Rivers with Dollond's 15-inch Theodolite.

Star observed	δ Ursæ Minoris (East and West).
Mean Right Ascension 1843·0	18^h 22^m 59^s
Mean North Polar Distance 1843·0	3° 24′ 23″·77
Local Mean Times of Elongation, December 27	Eastern 18^h 3^m; Western 5 57

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT				FACE RIGHT			
			Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	Interval in Time from Elongation	Reduction in Arc to Time of Elongation	Reduced Observation Ref. Mark – Star at Elongation	Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	Interval in Time from Elongation	Reduction in Arc to Time of Elongation	Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 27	E.	209 57	+ 2 3 49·67	18 3	− 0 39·38	+ 2 3 10·29	+ 2 4 59·67	28 47	− 1 39·95	+ 2 3 19·72
		&	3 34·00	16 16	0 31·98	2·02	4 40·67	27 4	1 28·38	12·29
		29 57	3 31·33	13 42	0 22·72	8·61	3 20·00	1 12	0 0·18	19·82
			3 24·00	12 7	0 17·76	6·24	3 14·00	0 26	0 0·02	13·98
			3 26·00	10 27	0 13·20	12·80	3 10·66	7 30	0 6·82	3·84
			3 23·00	9 12	0 10·23	12·77	3 26·33	10 12	0 12·59	13·74
			3 17·33	8 1	0 7·79	9·54				
			3 16·33	6 38	0 5·33	11·00				
„ 28	W.	190 1	+ 9 6 35·00	28 27	+ 1 37·67	+ 9 7 72·67	+ 9 7 53·34	14 15	+ 0 24·53	+ 9 7 77·87
		&	6 22·00	29 40	1 46·21	68·21	7 43·34	16 17	0 32·05	75·39
		10 0	5 28·33	35 12	2 29·35	57·68	7 12·00	21 49	0 57·48	69·48
			5 14·67	36 43	2 42·48	57·15	4 49·00	41 46	3 30·00	79·00
							4 29·00	43 16	3 45·34	74·34
							3 23·34	48 51	4 46·87	70·21
							2 55·67	51 24	5 17·29	72·96
„ 28	E.	190 1	+ 2 5 45·34	35 1	− 2 27·86	+ 2 3 17·48	+ 2 9 31·00	56 14	− 6 19·39	+ 2 3 11·61
		&	4 39·33	26 18	1 23·51	15·82	9 4·33	53 56	5 49·10	15·23
		10 1	4 25·00	24 9	1 10·40	14·60	3 17·67	2 14	0 0·60	17·07
			3 53·67	18 7	0 39·64	14·03	3 16·34	3 33	0 1·53	14·81
			3 48·33	16 33	0 33·14	15·19	3 23·33	9 53	0 11·84	11·49
			3 40·67	15 10	0 27·82	12·85	3 34·00	11 51	0 17·03	16·97
			3 32·33	13 23	0 21·65	10·68				
			3 22·66	6 12	0 4·65	18·01				
			3 21·00	4 41	0 2·66	18·34				
			3 21·00	3 30	0 1·49	19·51				
			3 18·33	2 17	0 0·63	17·70				
„ 29	W.	170 0	+ 9 6 23·66	30 47	+ 1 54·34	+ 9 7 78·00	+ 9 8 16·66	5 58	+ 0 4·31	+ 9 7 80·97
		&	5 54·66	33 32	2 15·53	70·19	8 12·66	8 51	0 9·46	82·12
		350 0	5 51·67	35 2	2 27·93	79·60	7 53·66	14 55	0 26·88	80·54
			5 31·00	36 24	2 39·69	70·69	7 15·67	22 56	1 3·52	79·19
							6 58·67	24 45	1 13·98	72·65
							4 21·67	44 32	3 58·68	80·35
							4 0·67	46 19	4 17·94	78·61
							3 38·33	48 28	4 42·39	80·72

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 29	E.	170 0	+ 2 3 10·00	4 21	− 0 2·30	+ 2 3 7·70	+ 2 4 23·00	23 28	− 1 6·47	+ 2 3 16·53
		&	3 8·33	2 29	0 0·75	7·58	4 13·66	22 14	0 59·75	13·91
		350 0	3 7·67	1 14	0 0·18	7·49	4 10·66	21 0	0 53·30	17·36
							4 9·66	19 41	0 46·81	22·85
							3 27·33	8 33	0 8·85	18·48
							3 29·33	10 38	0 13·70	15·63
							3 38·00	12 14	0 18·15	19·85
							3 34·66	13 57	0 23·56	11·10
							3 35·33	15 8	0 27·74	7·59
							3 41·00	16 22	0 32·46	8·54
„ 30	W.	209 59	+ 9 7 21·66	21 42	+ 0 56·91	+ 9 7 78·57	+ 9 6 57·66	26 5	+ 1 22·13	+ 9 7 79·79
		&	7 3·66	23 18	1 5·52	69·18	6 45·00	27 19	1 30·08	75·08
		30 0	7 3·00	24 21	1 11·56	74·56	6 41·00	28 14	1 36·23	77·23
							5 39·34	34 36	2 24·36	63·70
							5 11·67	37 29	2 49·25	60·92
							5 2·66	38 45	3 0·87	63·53
							4 55·00	39 42	3 9·85	64·85
							4 49·00	40 34	3 18·21	67·21

Abstract of Astronomical Azimuth observed at XII (Chaukola) 1843.

1. By Eastern Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R
Zero	170°	350°	190°	10°	210°	30°
Date	December 29		December 28		December 27	
	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	7·70	16·53	17·48	11·61	10·29	19·72
	7·58	13·91	15·82	15·23	2·02	12·29
	7·49	17·36	14·60	17·07	8·61	19·82
		22·85	14·03	14·81	6·24	13·98
		18·48	15·19	11·49	12·80	3·84
		15·63	12·85	16·97	12·77	13·74
		19·85	10·68		9·54	
		11·10	18·01		11·00	
		7·59	18·34			
		8·54	19·51			
			17·70			
Means	7·59	15·18	15·84	14·53	9·16	13·90
	° ′ ″		″		″	
Means of both faces	+ 2 3 11·39		15·19		11·53	
Az. of Star fr. S., by W.	183 32 29·96		29·63		29·30	
Az. of Ref. M. „	185 35 41·35		44·82		40·83	

Abstract of Astronomical Azimuth observed at XII (Chaukola) 1843—(*Continued*).

2. By Western Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R
Zero	170°	350°	190°	10°	210°	30°
Date	December 29		December 28		December 30	
	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	78·00 70·19 79·60 70·69	80·97 82·12 80·54 79·19 72·65 80·35 78·61 80·72	72·67 68·21 57·68 57·15	77·87 75·39 69·48 79·00 74·34 70·21 72·96	78·57 69·18 74·56	79·79 75·08 77·23 63·70 60·92 63·53 64·85 67·21
Means	74·62	79·39	63·93	74·18	74·10	69·04
	° ′ ″		″		″	
Means of both faces	+ 9 7 77·00		69·06		71·57	
Az. of Star fr. S., by W.	176 27 30·21		30·54		29·88	
Az. of Ref. M. „	185 35 47·21		39·60		41·45	

				°	′	″
Astronomical Azimuth of Referring Mark ...	by Eastern Elongation	...	...	185	35	42·33
	by Western „	...	...	„		42·75
	Mean ...	...	...	„		42·54
Angle Referring Mark and X (Valvan) *see page* 16—c. *ante* ...		...	...	− 19	21	29·43
Astronomical Azimuth of Valvan by observation		...	...	166	14	13·11
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 33—c. *ante*		...	...	166	14	15·76
Astronomical — Geodetical Azimuth at XII (Chaukola)		...	...	−		2·65

At XVI (Kumbhári)

Lat. N. 15° 9′ 1″·80; Long. E. 74° 20′ 14″·38 = 4^h 57^m 21^s·0; Height above Mean Sea Level, 2898 feet.
January 1844; observed by Lieutenant H. Rivers with Dollond's 15-inch Theodolite.

Star observed	λ Ursæ Minoris (West and East).
Mean Right Ascension 1844·0	20^h 18^m 15^s
Mean North Polar Distance 1844·0	1° 9′ 29″·02
Local Mean Times of Elongation, January 22	Western 6^h 12^m; Eastern 18 12

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT				FACE RIGHT			
			Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	Interval in Time from Elongation	Reduction in Arc to Time of Elongation	Reduced Observation Ref. Mark − Star at Elongation	Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	Interval in Time from Elongation	Reduction in Arc to Time of Elongation	Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Jan. 22	W.	60 0	− 3 44 44·34	39 35	+ 1 4·08	− 3 43 40·26	− 3 44 20·00	27 36	+ 0 31·20	− 3 43 48·80
		&	44 54·00	40 57	1 8·57	45·43	44 21·00	29 3	0 34·57	46·43
		240 0	44 56·67	42 0	1 12·13	44·54	45 47·33	54 9	1 59·63	47·70
			44 57·66	43 31	1 17·37	40·29	45 51·33	55 12	2 4·23	47·10
			45 4·33	45 6	1 23·10	41·23	46 4·67	58 29	2 19·40	45·27
			45 5·66	46 1	1 26·50	39·16				
„ 22	E.	60 0	− 6 6 54·34	28 57	− 0 34·31	− 6 7 28·65	− 6 7 20·33	15 18	− 0 9·59	− 6 7 29·92
		&	6 59·34	27 4	0 30·02	29·36	7 21·66	14 1	0 8·06	29·72
		240 0	7 1·34	26 1	0 27·73	29·07	7 22·33	12 42	0 6·61	28·94
			7 6·67	25 1	0 25·64	32·31	7 22·00	10 49	0 4·79	26·79
							7 23·00	9 49	0 3·95	26·95
							7 22·66	8 14	0 2·78	25·44
„ 23	W.	80 0	− 3 44 18·00	27 11	+ 0 30·27	− 3 43 47·73	− 3 44 47·66	41 2	+ 1 8·86	− 3 43 38·80
		&	44 22·00	28 23	0 33·01	48·99	44 52·66	42 6	1 12·42	40·24
		260 0	44 28·67	30 23	0 37·78	50·89	44 58·33	43 13	1 16·32	42·01
			44 29·67	31 34	0 40·79	48·88	45 0·33	44 18	1 20·19	40·14
			46 30·66	64 5	2 47·16	43·50	45 10·66	45 59	1 26·39	44·27
			46 37·66	65 17	2 53·46	44·20	45 26·33	48 4	1 34·32	52·01
			46 50·66	66 21	2 59·05	51·61	45 26·66	48 57	1 37·81	48·85
			46 47·00	67 9	3 3·37	43·63				
			46 53·00	67 59	3 7·92	45·08				
„ 23	E.	80 1	− 6 5 31·67	54 24	− 2 0·69	− 6 7 32·36	− 6 6 30·66	41 38	− 1 10·84	− 6 7 41·50
		&	5 39·34	52 46	1 53·57	32·91	6 30·66	40 33	1 7·21	37·87
		260 1	5 50·33	51 34	1 48·48	38·81	6 32·00	39 37	1 4·15	36·15
			5 52·33	50 24	1 43·70	36·03	6 33·00	38 34	1 0·84	33·84
			7 24·00	12 31	0 6·43	30·43	7 1·33	30 16	0 37·51	38·84
			7 25·00	10 48	0 4·78	29·78	7 2·67	27 22	0 30·65	33·32
			7 24·33	9 48	0 3·93	28·26	7 14·00	25 53	0 27·45	41·45
			7 28·00	8 32	0 2·99	30·99	7 11·67	24 46	0 25·13	36·80
			7 26·67	7 26	0 2·27	28·94	7 11·00	23 46	0 23·14	34·14
			7 26·67	6 19	0 1·64	28·31				
			7 31·00	5 53	0 1·42	32·42				

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT Interval in Time from Elongation	FACE LEFT Reduction in Arc to Time of Elongation	FACE LEFT Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT Interval in Time from Elongation	FACE RIGHT Reduction in Arc to Time of Elongation	FACE RIGHT Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Jan. 24	W.	40 0	− 3 43 57·33	14 33	+ 0 8·67	− 3 43 48·66	− 3 44 16·00	24 32	+ 0 24·67	− 3 43 51·33
		&	44 0·00	15 43	0 10·12	49·88	44 19·33	26 0	0 27·67	51·66
		220 0	43 54·67	16 35	0 11·27	43·40	44 22·66	26 55	0 29·66	53·00
			45 20·33	47 19	1 31·43	48·90	44 23·33	28 29	0 33·22	50·11
			45 25·00	48 44	1 36·98	48·02	44 23·67	29 33	0 35·76	47·91
			45 30·66	49 57	1 41·87	48·79	44 24·00	30 32	0 38·18	45·82
			45 30·66	51 18	1 47·37	43·29	44 26·67	31 30	0 40·64	46·03
			45 38·66	52 28	1 52·30	46·36	44 28·67	32 28	0 43·12	45·55
			45 41·33	53 29	1 56·69	44·64	44 36·67	33 32	0 46·06	50·61
„ 24	E.	40 0	− 6 5 56·33	47 34	− 1 32·40	− 6 7 28·73	− 6 7 0·33	28 20	− 0 32·87	− 6 7 33·20
		&	6 0·66	45 35	1 24·86	25·52	7 5·00	26 29	0 28·71	33·71
		220 0	6 10·00	44 2	1 19·25	29·25	7 6·66	25 7	0 25·85	32·51
			6 17·66	42 44	1 14·65	32·31	7 6·66	23 23	0 22·40	29·06
			7 30·00	6 41	0 1·84	31·84				
			7 30·33	4 10	0 0·71	31·04				
			7 31·33	2 46	0 0·31	31·64				
			7 32·67	1 22	0 0·08	32·75				
			7 32·33	0 12	0 0·00	32·33				
			7 32·67	1 54	0 0·15	32·82				

Abstract of Astronomical Azimuth observed at XVI (Kumbhári) 1844.

1. By Eastern Elongation of λ Ursæ Minoris.

Face	L	R	L	R	L	R
Zero	40°	220°	60°	240°	80°	260°
Date	January 24		January 22		January 23	
	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	28·73 25·52 29·25 32·31 31·84 31·04 31·64 32·75 32·33 32·82	33·20 33·71 32·51 29·06	28·65 29·36 29·07 32·31	29·92 29·72 28·94 26·79 26·95 25·44	32·36 32·91 38·81 36·03 30·43 29·78 28·26 30·99 28·94 28·31 32·42	41·50 37·87 36·15 33·84 38·84 33·32 41·45 36·80 34·14
Means	30·82	32·12	29·85	27·96	31·75	37·10
	° ′ ″		″		″	
Means of both faces	− 6 7 31·47		28·91		34·42	
Az. of Star fr. S., by W.	181 11 51·91		51·24		51·57	
Az. of Ref. M. „	175 4 20·44		22·33		17·15	

Abstract of Astronomical Azimuth observed at XVI (Kumbhári) 1844—(*Continued*).

2. By Western Elongation of λ Ursæ Minoris.

Face	L	R	L	R	L	R
Zero	40°	220°	60°	240°	80°	260°
Date	January 24		January 22		January 23	
	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	48·66 49·88 43·40 48·90 48·02 48·79 43·29 46·36 44·64	51·33 51·66 53·00 50·11 47·91 45·82 46·03 45·55 50·61	40·26 45·43 44·54 40·29 41·23 39·16	48·80 46·43 47·70 47·10 45·27	47·73 48·99 50·89 48·88 43·50 44·20 51·61 43·63 45·08	38·80 40·24 42·01 40·14 44·27 52·01 48·85
Means	46·88	49·11	41·82	47·06	47·17	43·76

	° ′ ″	″	″
Means of both faces	— 3 43 48·00	44·44	45·46
Az. of Star fr. S., by W.	178 48 8·26	8·92	8·59
Az. of Ref. M. „	175 4 20·26	24·48	23·13

		°	′	″
Astronomical Azimuth of Referring Mark ...	by Eastern Elongation	175	4	19·97
	by Western „		„	22·62
	Mean		„	21·30
Angle Referring Mark and XIV (Salili) *see page* 19—c. *ante*		— 20	48	45·13
Astronomical Azimuth of Salili by observation		154	15	36·17
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 33—c. *ante*		154	15	36·08
Astronomical — Geodetical Azimuth at XVI (Kumbhári)		+		0·09

July, 1889.

W. H. COLE,
In charge of Computing Office.

PRINCIPAL TRIANGULATION - SOUTH KONKAN COAST SERIES

Fig. No. 26

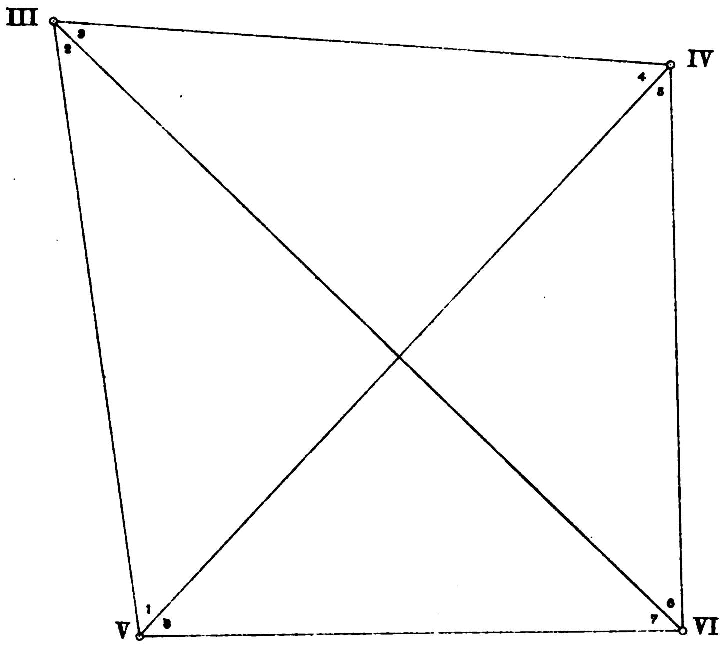


Fig. No. 27

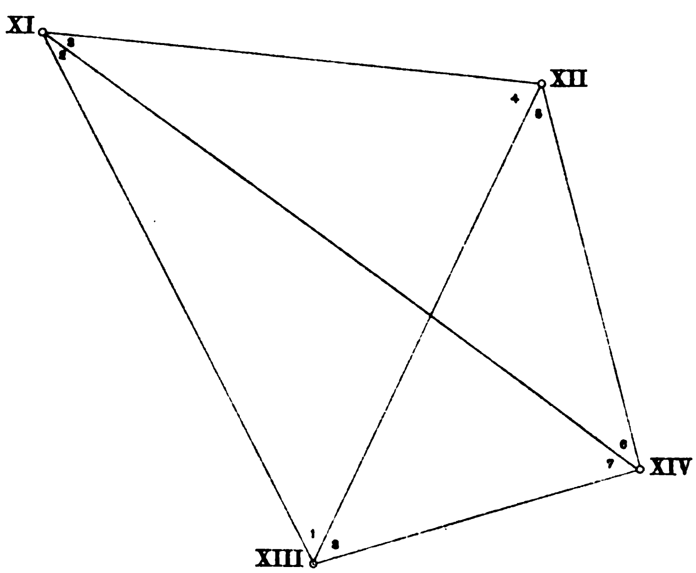
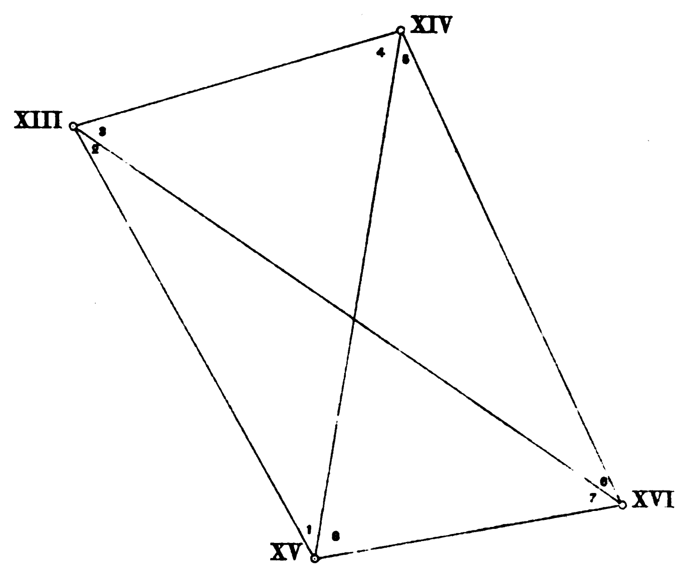


Fig. No. 28



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, March 1888.

MANGALORE MERIDIONAL SERIES.

THE MANGALORE MERIDIONAL SERIES.

INTRODUCTION.

The triangulation on the meridian of 75° is divided into three sections, of which the Series under review is the southern, the Khánpisura Meridional the central, and the Gurhágarh Meridional the northern. It is of a length approaching that of the Great Arc, and considerably longer than any other meridional series in India. It extends from the parallel of 33°, to the parallel of 13°, on which the towns of Madras, Bangalore (Bĕngalúr) and Mangalore (Mangalúr) are situated. In the country traversed by this Series very little triangulation had been executed by Colonel Lambton; his operations on the parallel of Madras did not extend north of Mangalore, and with the exception of a longitudinal series, immediately north of Nagar, which connects the western coast with the general network over the interior, he did not carry out any work near the meridian of 75°.

The Mangalore Meridional Series starts from the Bombay Longitudinal Series in latitude $18\frac{1}{4}$°, its sides of origin being Kem–Alsunda and Alsunda–Bori. At the parallel of $15\frac{1}{2}$° it is in close proximity with the southern end of the South Konkan Coast Series, and is connected with it by a principal longitudinal series consisting of 6 single triangles. After this junction the meridional series itself becomes a coast series.

The orders for its commencement were issued early in 1861, and the work was given for execution to the Bombay Party under Captain (now Colonel) C. T. Haig, R.E. This party was at the time employed in Gujarát, where it remained for the rest of the field season of 1860-61; but Mr. J. DaCosta, Civil 2nd Assistant, was deputed in January to take up the approximate work, and before his return to Poona (Puna) in the following May he had succeeded in selecting stations forming 5 polygons, which brought the approximate series down to latitude $15\frac{1}{2}$°.

During the field season of 1861-62, the Mangalore Meridional Series remained in abeyance owing to the want of a first class instrument, not one being then available, and the Bombay Party returned to Gujarát where Captain Haig extended the triangulation of the Gujarát Longitudinal Series from the meridian of 73° to its termination on a side of the Khánpisura Meridional Series as well as executing a portion of the Singi Meridional Series.

Season 1862-63.

PERSONNEL.

Captain C. T. Haig, R.E., 1st Assistant.
Mr. John Mc Gill, Civil Assistant.
" G. A. Anding, 2nd Class Sub-Assistant.
" J. E. Donohoe, 3rd " "

In October 1862—the instrument known as Barrow's 24-inch Theodolite No. 2 having been sent to Captain Haig—Mr. Anding was sent ahead and ordered to build the stations at the points selected by Mr. DaCosta. Before commencing the final angles, Captain Haig was directed to double the Bombay Longitudinal Series from Bidar as far west as the meridian of Mangalore, in order to ensure a firm base of emanation for the new series; whilst so employed he found that with very little extra labour he could also revise the whole of that portion of the Bombay Longitudinal Series. This revision he therefore carried out, and it was not till March 1863 that he was able to begin observing the final angles on the series under review. Meanwhile Mr. McGill, having by the middle of January selected the additional stations required on the Bombay Longitudinal Series, had proceeded to Belgaum (Belgaon), the nearest town to the station of Yalúr, and commenced laying out the small longitudinal chain* that was to connect the Mangalore Meridional with the South Konkan Coast Series. Yalúr–Samshergad was his side of origin, being a flank of one of Mr. DaCosta's approximate polygons, and the chain terminated on a side of the southern figure of the South Konkan Coast Series. Mr. McGill having completed the approximate work, returned to Dhárwár (Dhárvád), and taking up the selection of stations on the meridian of 75°, where Mr. DaCosta had left it, carried the approximate series south to within 30 miles of Mangalore. On this latter work he met with many difficulties, the country being one dense teak jungle; even the tops of the hills were covered with high trees which hindered him from obtaining a good view of the surrounding country; moreover there prevailed at the time a most malignant epidemical fever which had so depopulated the country, that even guides were procurable only with the utmost difficulty; and by the time Mr. McGill closed work, almost the whole of his party were sick.

In February, March and April Captain Haig, working with Barrow's 24-inch Theodolite No. 2, visited the stations of Kem, Alsunda, Bori and Kalas, and then proceeded to Palvan, where a serious accident occurred to the theodolite, which compelled him to close the field season's work. The following account of this untoward event is given by Captain Haig:—
"On the 17th April 1863, I set up the instrument in the observatory tent on a tower sta-
"tion near the village of Palvan. On the evening of the following day between seven and
"eight o'clock the outer platform on the west side gave way. Rain had then been falling
"for about two hours, and there was a very high easterly wind. The pressure and shock
"given by the observatory tent against the instrument made the stone of the masonry pillar
"underneath one foot of the stand yield, causing the immediate fall of the instrument.
"Having examined its position, I perceived that any attempt to remove it in the dark would
"only do further damage; I therefore secured all the ropes to keep every thing *in statû quo.*
"On the following morning I succeeded in releasing the instrument from the *débris* of the
"pillar without further injury.

"The platform was about 14 feet high, built of dry stone masonry with an exterior

* This chain of triangles is now considered a part of the South Konkan Coast Series.

"slope of 1 in 3. I examined the exterior work of the part which remained firm. It "seemed to be perfectly well built. My opinion is that the accident arose from an unequal "yielding of the ground, greater towards the centre of the platform than at the edge. It is "evident that it was not caused by any sudden additional pressure, as the instrument had "been fixed for 28 hours, during which period I had frequently been on the platform, at times "accompanied by 5 or 6 persons. No one was on the platform at the time of the fall. I do not "think the yielding could have been in the platform itself, as it was composed entirely of "stone, and would, if liable to give way, have done so suddenly, when the instrument was "being put up, and the platform was crowded with people."

In a letter to Major J. T. Walker, R.E., the Superintendent of the Great Trigonometrical Survey, on the subject of this accident Captain Haig writes:—"The sight on the morn-"ing of the 19th was one not easily described. The instrument was upside down, resting with "most pressure on the vertical circle and more lightly on the clamping circle, the axis being "fortunately supported by the observatory table; one of the gunbarrel legs of the table was "entangled between a microscope and the clamping circle, and the whole was enveloped in "the fly of the tent. Having made the slope of the *débris*, which consisted entirely of large "loose stones, fit for the descent of the bearers who were to carry the instrument down, the "first step was to remove the fly of the tent. I then took off all the microscopes except C, "the upper part of which had already been wrenched off while the lower was too tightly "screwed to the arm. By passing a rope round the axis and one of the tripod arms and "making it fast to a lever, I was enabled to support the instrument, and have the observa-"tory table and the stand removed. I next placed a pole between the pillars, and managed "to slide the instrument along it upside down. The Y's being opened when the instru-"ment was raised, the telescope and vertical circle were taken out and at once removed. "The instrument, resting upside down on the pole, and supported in that position on either "side, was then brought down the slope to the stand in the shade of my tent. The lifting "handles being fixed, it was carefully toppled over into three men's hands, and then placed "on the stand without further damage. The horizontal circle and the axis, the two most "important parts, are, I think, uninjured, as also the telescope and six microscopes. The "bend in the vertical circle is clear of those parts generally used in terrestrial observations; "I am therefore in hopes, that the damage is repairable."

No time was lost in sending the theodolite to Calcutta, where on the 16th June 1863, it was examined and reported on by the Mathematical Instrument Maker from whose statement it appeared that, besides serious injury to nine other components, a new vertical circle and its connecting parts were essentially necessary: the azimuth-circle could not be tested until the vertical axis was restored to an efficient state. Under these circumstances Major Walker directed the instrument to be despatched to London to Messrs. Troughton and Simms, who renovated so many of its parts that the old instrument may be said to have given place to a new one. The telescope, the vertical circle and the transit-axis were constructed anew; the vertical circle was adapted for shifting round the transit-axis, and the central cube of the telescope was perforated transversely to allow mutual visibility between two collimating telescopes. The pillar-table which had been cracked was renewed, and advantage was taken of the occasion to have the azimuth circle newly divided by the beautiful dividing engine in the factory of these noted instrument makers and also to have the whole of the microscopes exchanged for others of the newest pattern. This reconstruction was effected so rapidly that the theodolite was absent from the field for only one season.*

Season 1864-65.

PERSONNEL.

Captain C. T. Haig, R.E., 1st Assistant.
Mr. John Mc Gill, Civil Assistant.
„ G. A. Anding, 1st Class Sub-Assistant.
„ A. D. Christie, 3rd „ „
„ C. H. Mc A'Fee, 3rd „ „

During the field season of 1863-64 the party was employed on the triangulation of Káthiáwár (Káthiávád), while the Mangalore Meridional Series remained in abeyance.

In December 1864 on the return of the theodolite work was resumed. Unfortunately the stand of the instrument was not received in the field until the beginning of February, so that much of the field season was lost. Being thus prevented from continuing the principal triangulation, Captain Haig determined to take some star observations for latitude at Alsunda, a station of the Bombay Longitudinal Series, and one of those from which the Mangalore Meridional Series emanates. To supply the want of the stand three small brass chairs were fitted to that of an 18-inch instrument, just outside the old chairs, and the 24-inch was placed upon it: this method of course admitted of no change of zero. Prime vertical transits were taken to *83 Cancri* on 21 mornings, and a number of meridian altitudes were observed to six different stars—two close to the zenith, two about 6° N. and S. of the zenith, and two about 12° N. and S. of the zenith. Captain Haig then proceeded to Bori station, where he received the stand for his theodolite on the 4th of February, but owing to rainy and cloudy weather he could not complete observations till the 8th. By the 20th of March the principal triangulation had been carried down to Kundal station in parallel 17° 7′. The out-turn of work during the season consisted of 11 triangles forming two polygons and extending a direct distance of 85 miles. An azimuth of verification was also observed at Páchvad station.

Captain Haig proceeded on six months' furlough to Europe on the 14th April, and during his absence Lieut. C. A. Mc G. Skinner, R.E., held charge of the party. Mr. McGill had in the meanwhile been working on the approximate series: he took the field on the 3rd December, and proceeded south to Bisale station in latitude 13° 35′, the last point in the approximate series that he had fixed in 1862-63, and by the middle of February had selected all the stations for the Mangalore Meridional Series, and then, wheeling to the East, for the three following months was employed on the approximate work of the Madras Longitudinal Series: both were however subsequently re-cast by Major B. R. Branfill, as will be explained presently.

Season 1865-66.

PERSONNEL.

Captain C. T. Haig, R.E., 1st Assistant.
Mr. G. A. Anding, 1st Class Sub-Assistant.
„ A. D. Christie, 2nd „ „
„ C. H. Mc A'Fee, 3rd „ „

In May 1865 the party returned to Poona for the recess, leaving it again for the field in the following November, and on the 21st work was resumed at Kundal station. At almost all the stations of the Dandoba Dongar polygon the party was delayed by rain and clouds, but on entering the Karabgati polygon, the weather cleared and continued fine until the station of Samshergad was reached. Before completing the Chikk Nandihallígudd polygon, the party

* For a full description of the instrument and the work performed by it, see Appendix No. 2 of Volume II of the *Account of the Operations, &c.*

was delayed a week through the failure of the approximate series: the ray between the two southern stations was found impracticable, and a site for a new station, Kalkera, had consequently to be selected about a mile and a half east of the useless station. This gave the polygon an unsymmetrical shape, but it was the best that could be done, as the adjacent stations of the next polygon had been already built, and the ground was ill-adapted for good selection owing to the lowness of the hills.

On completing the Chikk Nandihallígudd polygon, Captain Haig took up the longitudinal series to Goa (Gova), intending to return and continue work on the Mangalore meridian when the former was finished. The approximate series however again failed, and another serious delay ensued. Páldi, an old station, was not on the highest point of the hill, and was simply a mark cut on the face of a rock. About 200 feet to the north of it was a ridge 15 feet higher, which entirely obstructed the view from the station of Bailúr; consequently a new station, Darsinga, had to be erected on the ridge. Whilst occupied with this work, Captain Haig received intimation that he had been transferred to the Northern Bombay Party, to take the place of Captain D. J. Nasmyth, R.E. He thought it better, however, to try and complete the series to Goa before his departure, but the country was so difficult, and the hills of Jarma and Salili so high and steep, that he was obliged to leave without carrying out his intention.

The districts traversed by the Mangalore Meridional Series this season, form a vast plain studded with solitary peaks, and broken here and there by low ranges of hills. Many of the peaks are crowned by small but well-built forts. The ranges of low hills are generally covered with brushwood, but in some cases their sides are carefully cultivated almost to the very summit. Belgaum and Dhárwár were the only towns of note whose positions were fixed. The former is built on a rock of laterite lying upon the trap of the Deccan; it possesses a fort, about 1000 yards in length and 700 in breadth, which is surrounded by a broad and deep wet ditch cut in hard ground. In 1818, after the overthrow of the Peshwa, the place was invested by a British force, and captured after a 21 days' siege. Dhárwár was formerly a fortified town of considerable strength; according to local tradition it was founded in 1403 by one Dhár Ráo, an officer in the Forest Department under Rám Rája, the Hindu king of Anigundi. The Anigundi kingdom was overthrown by Muhammad Ádil Sháh of Bijápur in 1568 A.D. In 1685 the fort of Dhárwár was captured by the Mughal Emperor of Delhi, and in 1753 fell into the hands of the Mahrattas. On the final overthrow of the Peshwa it came into the possession of the British Government.

During the field season 21 principal triangles were completed, forming one compound figure, one hexagon and one heptagon, and extending a direct distance of 120 miles between the parallels $15\frac{1}{2}°$ and $17\frac{1}{4}°$: 4 single triangles were also completed on the longitudinal series to Goa, covering a distance of about 30 miles.

Season 1866-67.

PERSONNEL.

Lieut. H. Trotter, R.E., Assistant Surveyor.
Mr. G. A. Anding, Sub-Assistant, 2nd Grade.
„ A. D. Christie, „ 3rd „
„ J. Bond, „ 4th „

On November 1st 1866 Lieutenant Trotter took over charge of the party from Captain Haig. Only three stations on the longitudinal series to Goa remained to be visited, so that the party during the field season was to be chiefly employed on the Mangalore Meridional Series in North Kánara (Kánada). The jungles of this district had of late years borne a deadly character, and enquiries shewed that the earliest possible time for commencing work, with a reasonable chance of the party not being paralysed from fever, was the beginning of February. To ensure reaching the district by this time Lieutenant Trotter proceeded to Bombay early in January, and engaged *pattemárs* (coasting craft) to take himself and his establishment to Goa, where, after a journey of 2½ days in a ten-ton boat, he arrived on the 12th. When Captain Haig visited Goa, the Bombay Government had applied to His Excellency the Governor General of Portuguese India for permission to carry survey operations through this territory: this had been cordially granted. Every assistance was also given to Lieutenant Trotter by the Governor General and his Staff. Orders were issued to the Custom-house authorities all over the district to pass his baggage free, not only of custom-duties but of the usual annoyance of examination and search. Sepoys were also attached to his camp to aid in procuring supplies. No amount of assistance however could avail to remove the physical obstacles presented by the mountains and rivers which had to be traversed to get from one station to another. Hence, although but three stations, Bori, Salili and Agoada, had to be visited, and in no case had more than two angles to be measured at a station, the better part of a month was spent in getting through this small amount of work, in spite of the weather being exceptionally fine and clear.

The district of Goa is 62 miles long and 40 broad and has a population of 400,000. It is a hilly country and intersected by numerous rivers which are generally navigable. In the days of its glory Goa was the chief *entrepôt* of commerce between the east and the west. But with the downfall of the Portuguese Empire it lost its commercial importance, and its trade has now dwindled into insignificance.

Having completed his observations at the stations in Goa territory, Lieutenant Trotter tried to go straight across the Gháts to Dhárwár, but was unable to do so owing to the difficulty of procuring carriage. The road moreover was reported as being just then exceedingly unhealthy. Agoada, however, being on the sea coast, the party was able to embark on *pattemárs* immediately after closing work, and sailed for Kárwár (Kárvár) which was reached on the evening of the 3rd of February, and marching *viâ* the Arbail ghát, a very roundabout but good road, proceeded to Samtráni, 24 miles north of Yĕllápur. There carts were exchanged for bullocks and coolies, and the party diverged to Kánsĕrudi, one of the west flank stations of the Ganigudd polygon, which was reached on the 16th of the same month. The centre and south-west flank stations of this polygon are in the dense Kánara forests, the best wooded in Western India.

Indúr station was reached at the end of March without any further check. In a letter on the subject of the best time of day for observing, Lieutenant Trotter writes:—"In Goa "the air was clear, and the weather on the whole very favorable, the morning heliotropes "being best and steadiest, a very unusual occurrence as far as my experience goes, but "caused, I imagine, by the sea breeze which at that time of the year used not to set in till "evening, continuing till late at night, causing wonderfully clear mornings and a very "steady atmosphere. As the sun got up mists gradually rose, and by 10 or 11 o'clock the "air would be very thick and becoming, later in the day, impenetrable by rays from either "afternoon heliotropes or lamps, which latter would generally be good signals early in the "morning. Above the Gháts, when I took up the series, the weather was somewhat the "same, in that, before the sun rose the air used to be very clear, but the moment the sun "got above the horizon mists rose with it, and what was a few minutes before a verdant "landscape, became almost miraculously transformed into an apparently foaming sea, with "the tops of the highest hills, like green and rocky islands, towering above the general level, "the moving clouds having the appearance of rolling billows; altogether a most magnificent "spectacle, not unimproved by the brilliant flashes of the heliotropes seen over this sea of "clouds. This appearance is not lasting, however, for the mists soon rise, enveloping every-"thing, and not generally dispersing till 9 or 10 A. M.

"These phenomena occurred early in the season, and of course observations to morn-"ing heliotropes were rarely if ever attainable. The afternoons were generally thickish, but "used to clear towards sunset, and the air purified by the sea breeze was generally good for "lamps. Later in the season however these mists, instead of rising about sunrise, used gene-"rally to begin to form about 8 or 9 o'clock in the evening, when, just as we had fairly com-"menced working to lamps, then bright and clear, first one lamp and then another would sud-"denly disappear, not to show again till the next evening, while the mists would at last rise "and surround the observatory tent. These mists never cleared off in time for morning "heliotropes, and consequently for the greater part of the season nearly the whole of the "observations were taken in the afternoon, when the signals were generally good. On one "occasion I took no less than fifty-seven single measures of angles working to afternoon "heliotropes. In April and May the work was very much interfered with by passing storms, "though these were so local, that sometimes I have gone on steadily working to capital "heliotrope signals, when perhaps the sun never shone on my own station the whole after-"noon, and the hill seemed surrounded by storms."

In the Kánara district the smoke from the burning jungles greatly hindered Lieutenant Trotter's progress, especially when there was no wind. Every year towards the end of February the villagers begin to burn these jungles, and until the heavy rains set in they light the fires regularly every day at two or three o'clock in the afternoon. The stations in this district would have been avoided, if possible, at that particular season, but it was unfortunately the only time they could be visited with impunity from fever, the curse of the district. Mr. Christie, who was working in Kánara in January 1866, states that when he was marching, the coolies used, as a regular thing, to put down their loads for two or three hours in the middle of the day, have their bout of fever and then go on again.

Having taken the precaution of not entering these jungles till the healthy season, Lieutenant Trotter's party for a couple of months escaped with comparatively little illness; but after the first heavy rains had fallen in April, Mr. Christie's party which was in advance building stations, was the first to suffer, and at one time the whole of his camp was down with fever. The observations of the Bhedasgávegudda compound figure were finished at Chandragutti station on the 20th of May, closing the field season's operations. On the afternoon of that day Lieutenant Trotter, and on the following day his observatory assistant, Mr. Bond, were attacked with fever. All the signal parties and nearly the whole of the standing camp were suffering more or less. The fever was not of a malignant type, but its effects were unfortunately more insidious than was thought, as is evident from the fact that although only one man actually died in the field, yet two died afterwards at Bangalore, and another while on his journey home on leave.

During the field season 13 principal triangles were completed, forming a hexagon and a compound figure, and extending a direct distance of 65 miles: the remaining 2 single triangles on the longitudinal series to Goa were also completed.

Season 1872-73.

PERSONNEL.

Major B. R. Branfill, Dy. Supt., 2nd Grade.
Lt. J. R. McCullagh, R.E., Asst. Supt., 1st Grade.
Mr. J. W. Mitchell, Asst. Surveyor, 1st „
„ O. V. Norris, „ „ 3rd „
„ C. D. Potter, „ „ 3rd „
„ E. W. Laseron, „ „ 3rd „

When Lieutenant Trotter commenced his operations in 1866, 165 miles of the Mangalore Meridional Series remained for completion, of which 65 miles had been accomplished by May 1867. The remaining portion was expected to prove exceptionally difficult; the country over which the principal triangulation was to pass, was hilly, wild and thinly populated; the climate was bad, and carriage was only to be procured with great difficulty. For five years no opportunity occurred of completing it, and it was not till the end of 1872 that the work was taken in hand. When the Survey party commenced operations at the beginning of the field season of 1872-73, they had before them an exceptionally large amount of work. In addition to the gap of 100 miles in the Mangalore Meridional Series, they had also to complete the Madras Longitudinal Series to the coast. Taking advantage of the first break of fine weather in the north-east monsoon rains, the party took the field at Bangalore on the 20th of October, and after a march of about 300 miles commenced operations, in the middle of November, on the terminal side Chandragutti–Halĕbail of Lieutenant Trotter's triangulation of 1866-67. Lieutenant McCullagh had charge of the main party and executed the final observations with Troughton and Simms' 24-inch Theodolite No. 1, with Mr. Laseron as recorder and office assistant.

Major Branfill himself undertook the examination and completion of the approximate series. He at once decided to reject the stations selected by Mr. Mc Gill west of the Ghâts, and to carry the series entirely east of them. Commencing work at Hukaligudda station, he visited in succession the stations of Hugadi, Siddeshvar, Kŏdashádri, Bisale, Hĕbbe and Valkunji, and rejoined the main party at Ságar on the 3rd of January. Between many of the stations there were no roads, and the party on several occasions was obliged to leave its camp and baggage for periods of a week or two: on one occasion the main party was for three weeks separated from its camp and supplies. During the season final observations were completed at 16 hill stations forming a compound figure, a quadrilateral and a hexagon. Two sets of azimuth observations were taken this season, but in order to push on the triangulation to the utmost and ensure its completion they were postponed to the last. Lieutenant McCullagh took one set at Koramúr finishing on the 27th of March, and Major Branfill observed the other at Mangalore, a station now appertaining to the Madras Longitudinal Series. By the 15th of April the party had returned to Bangalore, and the Mangalore Meridional Series had been completed.

The country traversed during the last season is one of great beauty and interest. Superficially it consists of forest-clad hills and valleys of no great height or depth, diversified by open grassy glades and downs, many streams and rivers, precipitous cliffs and prominent peaks. The prime feature of the country is the irregular ridge line of the Western Gháts, running generally N. N. W. and S. S. E., at a distance of 10 to 30 miles from the western coast, and rising from a height of 1,500 feet in Sunda to 3,500 feet in Manjarabad. This part of the country is called the "Malnád" (*lit.* rain-district) from the excessive amount of rain which falls here. On the western slopes and summits of the Gháts the rainfall from May to October is very heavy, from 150 to perhaps 300 inches or more falling in a single season; and this combined with frequent dense fogs and clouds, night and morning when there is no rain, and also with the moisture wafted in from the west by the sea-breeze during the hot months from February to May, produces and reproduces such a vigorous growth of plants and trees, that the people can hardly keep their clearings free from jungle. Numerous peaks rise 500 to 1,000 feet above the average height of the range, but few of them exceed 3,600 feet above the sea; Chandragutti (2,800), Kŏdashádri (4,400) and Kudurĕmukha (6,200) stand out very conspicuously above all the rest, and are only equalled by Meruti in the Tungabhadra Doáb, and surpassed only by the Chandra-drona, now also commonly called the Bababudan from the name of a Muhammadan Pír who died about 1850, and who is reported to have first introduced the coffee plant into Mysore (Maisúr).

The passes over the mountains are numerous, being on the average only 10 miles apart; and though mostly disused and impracticable now, attest the fact that there was formerly much traffic between Mysore and the west coast. The population of the Malnád has greatly diminished from what it was in former times. The large towns which once existed, and particularly the city of Nagar, named Haidar Nagar by Haidar Ali, are almost abandoned; and, judging from the frequency of the deserted rice-fields, the rural population has also probably decreased in recent times.

Slavery, or rather domestic serfdom, was once general in this part of the country, but is now disappearing. The introduction of coffee is supposed to be the main cause of its decline. The coffee planters require labourers and offer high wages, and in order to obtain them, pay largely in advance, a temptation that serfs, who had been accustomed to receive only their food and clothing, were unable to withstand.

In the general reduction of the Southern Trigon, the portions of the errors, which fell to the share of the Mangalore Meridional Series and were dispersed throughout it, were as follows:—

In	Latitude	...	...	$-\ 0''\cdot036$
„	Longitude	...	...	$+\ 0\ \cdot231$
„	Azimuth	...	...	$-\ 0\ \cdot665$
In side	Logarithm	...	...	$-\ 0\ \cdot000{,}0021{,}8$
	giving a ratio of about ·32 of an inch per mile.			

Secondary Triangulation.

A large amount of secondary triangulation was carried out by Captain Haig in the field-season of 1865-66; numerous points such as mosques, forts and temples were fixed, not only in the area embraced by the principal series, but also for considerable distances from its flanks; and the positions of the two cantonment stations of Belgaum and Dhárwár were determined. In the following year, whilst waiting for the unhealthy season in Kánara to pass, Lieutenant Trotter executed some minor triangulation in the neighbourhood of Indápur. Major Francis, the Survey and Settlement Commissioner, Northern Division, Bombay Presidency, was anxious to get some of his revenue boundary marks laid down carefully by trigonometrical observations, as a test of the accuracy of the work of his own assistants, and for the purpose of having accurate data for the construction of his own maps. The first thing to be ascertained before commencing the work, was the state of the secondary stations of the Great Trigonometrical Survey, the operations of which had passed through a portion of the district. On examination none of the secondary points were to be found, with one single exception, although the names were in existence in the records, and their latitudes, longitudes, azimuths and heights had been accurately determined. Apparently in many instances these stations had originally consisted of a single stone imbedded, perhaps, in the centre of a large flat field on the top of a high piece of ground, with no means whatever of identifying it. These marks were useless without the most minute and accurate description of their whereabouts, as the ground is either so wildly undulating, that search might be made for hours before the highest point in the neighbourhood could be found, or else it consists of high, flat table-lands extending from one fourth of a mile to several miles in length, and generally covered with stones large and small. These table-lands are so flat, that if three or four different men were sent at different times, it is probable that no two of them would select the same spot as the highest. Unless, therefore, very careful descriptions of these stations were forthcoming, it was almost useless making search for them. Unfortunately no descriptions of any sort were to be found, and hence only one station was discovered. As it was therefore impossible to make use of any former secondary work, Lieutenant Trotter determined to break up the principal triangulation afresh, and to cover the whole of the district to be surveyed with a net-work of triangles having sides from three to five miles in length. The new stations were built with great care, and an accurate description of each recorded.

In the field season of 1872-73, the positions and heights of a number of secondary stations and 53 unvisited points were fixed: some stations of Colonel Lambton's triangulation were found, with mark-stones in position, and connected: and other points of the old survey were also connected, but as no station marks were found, their identification was not exact.

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MANGALORE MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION. ALPHABETICAL LIST OF STATIONS.

Alsunda	XIX. (Of the Bombay Longitudinal Series).
Ánúr	VI. (Of the Madras Longitudinal Series).
Athni	XI.
Aundh	VI.
Bhedasgávegudda	XXXI.
Bisale	XLIV.
Bori	XXII. (Of the Bombay Longitudinal Series).
Chandragutti	XXXIV.
Chikk Nandihallígudd	XX.
Dandoba Dongar	IX.
Daphlápur	X.
Dindĕmane	XXXVIII.
Ganigudd	XXVI.
Halĕbail	XXXV.
Hatarvat	XIV.
Hĕbbe	XLVI.
Hirĕgudda	XLV.
Hirĕkummígudd	XXI.
Hŏnnavalli	XL.
Hugadi	XLI.
Hukaligudda	XXXVI.
Indúr	XXIX.
Kalas	I.
Kalkera	XXV.
Kaltigudda	XXXVII.
Kánsĕrudi	XXVIII.
Karabgati	XV.
Karigudd	XVII.
Karĕkyatanhalli	XXXII.
Kathárigad	XVIII.
Katphal	V.
Kem	XVII. (Of the Bombay Longitudinal Series).
Kŏdashádri	XLII.
Kolanhatti	XIX.
Koramúr	XXXIX.
Kudurĕmukha	III. (Of the Madras Longitudinal Series).
Kundal	VIII.
Kundgol	XXVII.
Majala	XII.
Manikeri	XVI.
Mávinhúnda	XIII.
Menshigudda	XXXIII.
Navalúr	XXIV.
Páchvad	IV.
Palsi	VII.
Palvan	III.
Rámankŏp	XXX.
Samshergad	XXIII.
Siddeshvar	XLIII.
Sulki	II.
Valkunji	XLVII.
Yalúr	XXII.

MANGALORE MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION. NUMERICAL LIST OF STATIONS.

XVII	Of the Bombay Longitudinal Series.	Kem.	XXIV		Navalúr.
XIX	Of the Bombay Longitudinal Series.	Alsunda.	XXV		Kalkera.
XXII	Of the Bombay Longitudinal Series.	Bori.	XXVI		Ganigudd.
I		Kalas.	XXVII		Kundgol.
II		Sulki.	XXVIII		Kánsĕrudi.
III		Palvan.	XXIX		Indúr.
IV		Páchvad.	XXX		Rámankŏp.
V		Katphal.	XXXI		Bhedasgávegudda.
VI		Aundh.	XXXII		Karĕkyatanhalli.
VII		Palsi.	XXXIII		Menshigudda.
VIII		Kundal.	XXXIV		Chandragutti.
IX		Dandoba Dongar.	XXXV		Halĕbail.
X		Daphlápur.	XXXVI		Hukaligudda.
XI		Athni.	XXXVII		Kaltigudda.
XII		Majala.	XXXVIII		Dindĕmane.
XIII		Mávinhúnda.	XXXIX		Koramúr.
XIV		Hatarvat.	XL		Hŏnnavalli.
XV		Karabgati.	XLI		Hugadi.
XVI		Manikeri.	XLII		Kŏdashádri.
XVII		Karigudd.	XLIII		Siḍdeshvar.
XVIII		Kathárigad.	XLIV		Bisale.
XIX		Kolanhatti.	XLV		Hirĕgudda.
XX		Chikk Nandihallígudd.	XLVI		Hĕbbe.
XXI		Hirĕkummígudd.	XLVII		Valkunji.
XXII		Yalúr.	III	Of the Madras Longitudinal Series.	Kudurĕmukha.
XXIII		Samshergad.	VI	Of the Madras Longitudinal Series.	Ánúr.

MANGALORE MERIDIONAL SERIES.

DESCRIPTION OF PRINCIPAL STATIONS.

All the Principal Stations hereafter described are situated on hills. With the exception of Station II which is denoted simply by a mark-stone imbedded on the summit of a temple, each consists of a circular and isolated pillar of masonry either perforated or solid, 3 to 3⅓ feet in diameter and generally about 5 feet in height, though in certain cases the heights vary from 1 to 8 feet. In the centre and upper surface of the pillar is embedded a stone on which is engraved a mark (circle and dot) in the normal of one or more similar marks below, the lowermost mark being in some instances cut on the rock *in sitû*. Around the pillar and level with its upper surface a platform of stones, or of stones and earth—16 feet in diameter or from 12 to 16 feet square—is built for the accommodation of the observatory tent: in a few cases the platform had to be supported by logs of wood. In the northern portion of the Series, down to station XL, all the pillars are of the perforated kind, access to the ground level or lower mark at these stations being obtained by an aperture through the platform and pillar. At the remaining stations the pillars are of the solid kind.

All the stations except XVII of the Bombay Longitudinal Series and XXVIII, XXX, XXXI and XXXIII of this Series have their upper marks protected by small pillars of masonry in the form of a frustum of a pyramid, 28 inches square at base, 20 inches at top and 3½ feet in height. These protecting pillars carry sufficiently accurate marks on their upper surfaces for Topographical and Revenue Survey purposes as shewn at page 74 of Volume II of the *Account of the Operations &c.*

The following descriptions have been compiled from those given by the Officers who executed the Series and others who visited certain of the stations subsequently, supplemented in the majority of cases, as regards adjacent villages and places from the Topographical Survey Maps of the country traversed, and corrected, so far as the local sub-divisions in which the several stations are situated, from the latest Annual Reports furnished by the District Officers to whose charge the stations were committed.

The orthography is based on the official lists published under the orders of the Government of India, except that the long *é* is unaccented as in all previous volumes of this series, and the short *e* is shewn thus, *ĕ*; the same remarks apply to *o*. Final vowels and those in well-known terminals are unaccented. When the popular spelling of a name has been accepted by Government, its correct transliteration is given in parenthesis where the name occurs for the first time.

XVII.—(*Of the Bombay Longitudinal Series*). Kem Hill Station, lat. 18° 11′, long. 75° 21′—observed at in 1838, 1863 and 1865—is situated on a low flat-topped hill. There are two knolls nearly of the same height as the station, each distant about 2 miles, the one to the W. and the other to the N.W., the former being crowned by a temple. The station lies about 2 miles E. by N. of the Railway station of Kem on the G. I. P. Line. It is in the lands of the village of Kem, taluka Karmála, district Sholápur (Solápur).

The station of 1838 consisted of the usual circle and dot mark cut on a large stone at the level of the ground. When visited in 1863, the mark was found in position: over this a circular, perforated and isolated pillar of masonry 4·8 feet high was built, carrying a mark-stone in its upper surface. The pillar is enclosed in a platform of loose stones, through which and the central pillar an aperture was constructed giving access to the lower mark. In 1865 the station was found in good order. When visited in 1870 for Latitude Observations and in 1878-79 by the Levelling Party, the upper mark-stone was found intact. The directions and distances of the circumjacent villages are:—Bhagevádi E.S.E., mile ¾; Pathurti N., miles 2¼; Jákhla E.S.E., miles 2; Kem W.S.W., miles 2; and Malori W.N.W., miles 3¾.

XIX.—(*Of the Bombay Longitudinal Series*). Alsunda Hill Station, lat. 18° 27′, long. 75° 3′—observed at in 1837 and 1863—is situated on the highest part near the western brow on the summit of a flat-topped hill which extends nearly a mile from S.E. to N.W. with a breadth of about 300 yards; it lies 3¼ miles N. by W. of Korti on the road from Pomalvádi to Karmála and 1¼ miles W. of the road from Korti to the village of Alsunda. The station is in the lands of the village of Alsunda, taluka Karjat, district Ahmednagar (Ahmadnagar).

The station of 1837 consisted of a platform with the usual mark on top and another cut on a large stone 5·69 feet below at the level of the ground. When visited in 1863, the lower mark was found in position: over this a circular, perforated and isolated pillar of masonry 5 feet high was built carrying a mark-stone in its upper surface. The pillar is enclosed in a platform of earth and stones 16 feet in diameter, through which and the central pillar an aperture was constructed giving access to the lower mark. When visited in 1881-82 by the Levelling Party, the station was found protected by a rectangular pillar of masonry 2 feet high built over the circular pillar, the whole covered over by a large mound of earth and stones. The directions and distances of the circumjacent villages are:—Alsunda N.E. by N., miles 2; Banauri N.W. by N., miles 3¾; Chilavádi S.W., miles 3; and Malungi E., miles 5.

XXII.—(*Of the Bombay Longitudinal Series*). Bori Hill Station, lat. 18° 25′, long. 74° 40′—observed at in 1838, 1863 and 1865—is situated near the northern extremity of an extensive plateau rising about 250 feet above the G. I. P. Railway line, which runs through the Bhíma valley north of the station. It lies about 1 mile S.W. of the Railway station of Boríbyál. The station is in the lands of the village of Boríbyál, taluka Bhimthadi, district Poona (Puna).

The station of 1838 consisted of a platform with the usual mark on top and another 5·1 feet below at the level of the ground. When visited in 1863, the lower mark was found in position: over this a circular, perforated and isolated pillar of masonry 5·1 feet high was built, carrying a mark-stone in its upper surface. The pillar is enclosed in a platform of earth and stones 16 feet in diameter through which and the central pillar an aperture was constructed giving access to the lower mark. In 1865 the station was found in good order. When visited in 1878-79 and 1881 by the Levelling Party, the station was found protected by a rectangular masonry pillar 31 inches high built over the circular pillar, a cylindrical stone with dot and circle engraved on it was found fitted loosely into this rectangular pillar, the whole enclosed in a large mound of earth and stones. The directions and distances of the circumjacent villages are:—Bori S.E. by E., miles 1¾; Alegaon N.E. by N., miles 2¼; Khorauri N.N.W., miles 2½; and Mallad (on the road from Pátas to Kumbhárgaon) S.W. by S., miles 3¾.

I. Kalas Hill Station, lat. 18° 9′, long. 74° 52′—observed at in 1837, 1863 and 1865—is situated on a wide plateau of sandstone formation rising about 100 feet above the plain, about 2½ miles E.S.E. of the village of Kalas, 1 mile N.E. of the village road between Kalas and Shelgaon, and 5¼ miles N.N.E. of the village of Haturneh on the road from Báramati to Nimbgaon. The station is situated in the lands of the village of Rui, taluka Indápur, district Poona.

The station of 1837 consisted of a platform about 9 feet high having a mark in its upper surface and another 1·58 below. In 1863 the station was rebuilt consisting of a platform of earth and stones enclosing a perforated pillar of masonry 7·1 feet high, the upper portion of which is circular and isolated. There are two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the latter. No change appears to have been made in 1865. When visited in 1879 by the Levelling Party, the station was found intact. The directions and distances of the circumjacent villages are:—Rui N.E. by E., miles 2¼; Vehali S.E. by E., miles 4; Shelgaon S. by E., miles 3½; Barna S.W., miles 2½; and Nhavi E.N.E., miles 3¼.

II. Sulki Hill Station, lat. 17° 46′, long. 74° 56′—observed at in 1865—is on the summit of a small Hindu Temple, built on a high conical hill, 2¼ miles S.S.E. of Berad village on the road from Málsiras to Mhasvad. It is identical with an old station of the same name of the Bombay Longitudinal Series, fixed in 1837. The station is in the lands of the village of Garvad, taluka Málsiras, district Sholápur.

The station is denoted by a mark-stone imbedded on the summit of the temple. The directions and distances of the circumjacent villages are:—Julbhavi W. by S., miles 2¾; Máudki W.N.W., miles 3½; and Tarangphal E.N.E., miles 2¼.

III. Palvan Hill Station, lat. 17° 50′, long. 74° 29′—observed at in 1865—is situated on the highest of a number of flat-topped hills, 1½ miles E.N.E. of the village of Palvan, 10½ miles S. of the town of Phaltan and 3½ miles S. by W. of Girvi village. The station is in the lands of the village of Palvan, taluka Mán, district Sátára.

The station consists of a platform of stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other at the ground level; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Ghora E., mile 1; Gaidhara S.W. by S., miles 1¼; Bhápka W.N.W., miles 2¼; and Bhorka N.N.W., miles 2½.

IV. Páchvad Hill Station, lat. 17° 31′, long. 74° 42′—observed at in 1865—is situated on a flat-topped hill, the highest point of the range, 2¼ miles S.S.E. of the village of Kukudvad, 11½ miles S.W. of the town of Mhasvad on the road from Sátára to Pandharpur. The station is in the lands of the village of Kukudvad, taluka Mán, district Sátára.

The station consists of a platform of stones enclosing a circular, perforated and isolated pillar of masonry 5·1 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Katera S., mile 1; Mana W. by N., mile 1; Pokra N. by E., mile 1; and Valai E.N.E., miles 3.

V. Katphal Hill Station, lat. 17° 33′, long. 75° 4′—observed at in 1865—is on a conical shaped hill rising about 200 feet above the surrounding country, and lies 5¾ miles S.W. by W. of the village of Mahud on the road from Khánápur to Pandharpur, and 1¼ miles S.E. of Katphal village on the same road. The station is in the lands of the village of Katphal, taluka Sángola, district Sholápur.

The station consists of a platform of stones enclosing a circular, perforated and isolated pillar of masonry about 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other at the ground level; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Chikk Mahad N.E., miles 3½; Achakdani S.E., miles 2½; Umbargaon W. by S., miles 4½; and Bangad N.E. by N., miles 1½.

VI. Aundh Hill Station, lat. 17° 33′, long. 74° 24′—observed at in 1865—is situated on the centre of a flat portion rising 20 feet abruptly above the summit of the flat-topped hill, 2 miles N.E. of the large village of Aundh, 11 miles E. by S. of the town of Rahimatpur on the road to Sátára. The station is in the lands of the village of Aundh, thána Aundh, Sátára Agency.

The station consists of a platform of stones enclosing a circular, perforated and isolated pillar of masonry 5·1 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other at the ground level; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Gusavi S.E. by E., mile ¾; Varúr N.N.E., miles 1¾; Kumta E.N.E., miles 2¾; and Gopuj S.E. by E., miles 3. When visited in 1878-79 by the Levelling Party the station was found intact.

VII. Palsi Hill Station, lat. 17° 13′, long. 74° 53′—observed at in 1865—is situated on a ridge rising abruptly from the hill to a height of about 20 feet, and lies 1½ miles E.S.E. of the village of Palsi which is about ½ a mile N. of the road from Karád to Bijápur. The station is in the lands of the village of Kusavdi, taluka Tásgaon, district Sátára.

The station consists of a platform of stones enclosing a circular, perforated and isolated pillar of masonry about 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other at the ground level; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Bánúr N.E. by E., miles 3; Páchegaon E. by S., miles 3¾; Jarandi S., miles 2; and Hivra W. by N., miles 3½.

VIII. Kundal Hill Station, lat. 17° 8′, long. 74° 27′—observed at in 1865—is situated on a high flat-topped hill, about 1 mile N.W. of the village of Kundal which lies about ½ a mile off the road from Karád to Tásgaon. The station is in the lands of the village of Kundal, thána Kundal, Sátára Agency.

The station consists of a platform of rubble stones enclosing a circular, perforated and isolated pillar of masonry 5·1 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Kumbhargaon N.E. by N., mile 1; Dudhondi S.W. by S., miles 2; Devarashta N. by W., miles 2¾; and Bálavdi N.E. by E., miles 4½.

IX. Dandoba Dongar Hill Station, lat. 16° 55′, long. 74° 47′—observed at in 1865—is situated on the highest part of a flat-topped range of hills on the boundary of the villages of Bhosa, Kharsang, Khandrajuri and Málgaon, and lies about 9 miles N.E. of the town of Miraj on the road from Kolhápur to Athni. The hill is named after the large Hindu temple which stands on it at a distance of ½ a mile N.N.E., of the station. It is in the lands of the village of Malgaon, pargana and state of Miraj, Southern Marátha Agency.

The station consists of a platform of rubble stones enclosing a circular, perforated and isolated pillar of masonry 5·2 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other at the ground level; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Kharsang N.E., miles 3½; Khandrajuri S.E. by E., miles 3½; Bhosa N.W., miles 2¾; and Malgaon S.S.W., miles 4½.

X. Daphlápur Hill Station, lat. 17° 2′, long. 75° 10′—observed at in 1865—is situated on a low hill, about 3½ miles N.E. by E. of the village of Daphlápur and 7 miles W. by S., of the town of Jath on the road from Karád to Bijápur. The station is in the lands of the village of Daphlápur, Daphlápur State, Sátára Agency.

The station consists of a platform of rubble stones enclosing a circular, perforated and isolated pillar of masonry 4·8 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other at the ground level; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Khalati S.E. by S., miles 1½; Vashán E.N.E., miles 2½; Kanti N.E. by N., miles 2¾; and Belunki W. by N., miles 2¾.

XI. Athni Hill Station, lat. 16° 43′, long. 75° 9′—observed at in 1865—is situated on a plateau having its surface slightly undulating, about 2½ miles S. of the road from Miraj to Bijápur, and the same distance E.S.E. of Athni. The station is in the lands of the village of Athni, taluka Athni, district Belgaum (Belgaon).

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Barchi E.N.E., miles 4; Katkeri E.S.E., miles 2; Ratnapur S.E. by S., miles 2½; and Sukanhati W.S.W., miles 4.

XII. Majala Hill Station, lat. 16° 47′, long. 74° 29′—observed at in 1865—is situated on a flat-topped hill, about ¾ of a mile N.N.E. of the small village of Majala which lies ⅜ of a mile N. of the high road from Kolhápur to Shirol. The station is in the lands of the village of Majala, taluka Álta, Kolhápur Agency.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in the upper surface of the pillar and the other 5 feet below; an aperture gives access to the lower mark. When visited in 1872 for Latitude Observations the station was found intact. The directions and distances of the circumjacent villages are:—Álta W. by S., miles 3; Nejh N.W., miles 1⅜; and Kumbhoj N. by W., miles 3.

XIII. Mávinhúnda Hill Station, lat. 16° 25′, long. 74° 50′—observed at in 1865—is situated on the western brow of a flat-topped hill, about 14 miles E. of the town of Chikodi, and 17 miles N. of the town of Gokák a mile S.W. of the high road between Hukeri and Manoli. The station is in the lands of the village of Mávinhúnda, taluka Shirol, Kolhápur Agency.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. When visited in 1872 for Latitude Observations the station was found intact. The approximate directions and distances of the circumjacent villages are:—Hubarhalli N.W., miles 2¼; Budihal W. by N., miles 2½; Mávinhúnda S. by W., miles 1¼; and Baikud E. by N., miles 3.

XIV. Hatarvat Hill Station, lat. 16° 21′, long. 74° 32′—observed at in 1865—is situated on an elevation rising some 20 feet above the hill on which the village of Hatarvat is. The station lies 7½ miles E.S.E. of the town of Nipáni, and 6½ miles N. of that of Sankeshvar on the high road to Belgaum. The station is in the lands of the village of Hatarvat, taluka Chikodi, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Nari N.W. by N., miles 2¼; Bidarhalli E. by N., miles 2½; and Bhar S.S.W., miles 2½.

XV. Karabgati Hill Station, lat. 16° 8′, long. 74° 50′—observed at in 1865—is situated on a slight elevation on a very elevated table-land, about a mile S. of the Márkándeya river, a branch of the Ghatprabha, and 3 miles S.W. by S. of Gokák near the road from Hukeri to Saundatti (Sanvadatti). The station is in the lands of the village of Gokák, taluka Gokák, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Hatti W. by N., miles 3; Kelvi S.E., miles 3½; and Puranhatti N.E. by E., miles 4¾.

XVI. Manikeri Hill Station, lat. 16° 9′, long. 75° 7′—observed at in 1865—is situated on a slight elevation (about 10 feet high) on a flat-topped hill at the foot of which lies the village of Manikeri; it is 9½ miles S.W. by W. of Yádvád on the road from Gokák to Kaládgi. The station is in the lands of the village of Manikeri, taluka Gokák, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Kaligudi N.E., miles 2; Kaujalgi N. by W., miles 3½; Baghalla W. by S., miles 4; and Melikeri S.S.W., miles 2.

XVII. Karigudd Hill Station, lat. 16° 6′, long. 74° 29′—observed at in 1866—is situated on a conical hill about 5½ miles W. by S. of the town Yamkanmardi near the high road from Sankeshvar to Belgaum, and 4 miles N. of the Ghatprabha river. The station is in the lands of the village of Bidarvádi, taluka Chikodi, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contained two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The upper mark-stone was removed by some villagers shortly after the observations were completed. The approximate directions and distances of the circumjacent villages are:—Bugarkatti N., mile 1; Kot S.W., miles 2; and Bidarhalli S. miles 1½.

XVIII. Kathárigad Hill Station, lat. 15° 54′, long. 75° 1′—observed at in 1866—is situated on a bastion of the ruined hill fort of Kathárigad about 3 miles S. of the high road from Belgaum to Kaládgi, and 3½ miles E.N.E. of Murgod. The station is in the lands of the village of Murgod, taluka Parasgad, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in the upper surface of the pillar and the other 4·9 feet below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Halki W.N.W., miles 4; Romapur S.W. by W., miles 1½; and Samapur S.E. by S., miles 1¾.

XIX. Kolanhatti Hill Station, lat. 15° 55′, long. 74° 45′—observed at in 1866—is situated on a range of flat-topped hills running from E. to W. and lying about 2 miles W. of the village of Deshnúr and the same distance N. of the high road from Belgaum to Kaládgi. The station is in the lands of the village of Deshnúr, taluka Sampgaon, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in the upper surface of the pillar and the other 5 feet below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Kolanhatti S.E. by E., mile 1; Kardígudi S.W. by S., miles 3; and Nelseri E., miles 4.

XX. Chikk Nandihallígudd Hill Station, lat. 15° 38′, long. 74° 51′—observed at in 1866—is situated on a small hill lying immediately E. of the high road from Kittúr to Bailhongal, and about 2½ miles N.E. of the former town. The station is in the lands of the village of Chikk Nandihalli, taluka Sampgaon, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Chikk Nandihalli N.N.W., miles 1½; Ouradi S., mile 1; Dimati W.N.W., miles 2; and Sigihalli E., miles 3.

XXI. Hirĕkummígudd Hill Station, lat. 15° 44′, long. 75° 15′—observed at in 1866—is situated on a flat-topped hill locally called Fakír Sahib, at the foot of which lies the village of Hirĕkummi. There are three mosques on the hill, one called Bara Imám is 30 yards N.E. of the station, and the other two 100 yards to the W. The station is 10 miles S.E. by S. of the town of Manoli, and 6 miles E.S.E. of that of Saundatti. The station is in the lands of the village of Hirĕkummi, taluka Parasgad, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5·1 feet high, which contains one mark-stone (the lower); an aperture gives access to it. The approximate directions and distances of the circumjacent villages are:—Chikk Kummi E.N.E., mile 1; Dubal N. by E., mile ½; Hirĕkummi S.S.W., mile ¾; and Harlapur N.W. by N., miles 2½.

XXII. Yalúr Hill Station, lat. 15° 45′, long. 74° 34′—observed at in 1866—is situated near the S.W. corner of the ramparts of the hill fort of Yalúr lying 2 miles E. of the high road from Belgaum to Haliyál, and about 7 miles S. of the cantonment of Belgaum. The station is in Kurundvád State, Southern Marátha Agency.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in the upper surface of the pillar and the other 6 feet below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Yalúr N. by W., miles 2; Sulge N.W. by N., mile 1; Desúr W.S.W., miles 1½; and Nagauhatti S.E. by S., miles 1½.

XXIII. Samshergad Hill Station, lat. 15° 34′, long. 74° 34′—observed at in 1866—is situated on the highest of the three conical shaped hills, about 3¼ miles W. by S. of the village of Nandgad, and 5½ miles S. by E. of the town of Khánápur on the high road from Belgaum to Nandgad. The station is in the lands of the village of Nandgad, taluka Khánápur, district Belgaum.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Naikol S.W. by W., miles 1½; Sawargali N.W. by N., mile 1; and Hirĕbhalke S.W., miles 2.

XXIV. Navalúr Hill Station, lat. 15° 26′, long. 75° 6′—observed at in 1866 and 1867—is situated on a small hill about a mile N. of the high road from Hubli (Hubballi) to Dhárwár (Dhárvád), and 4 miles S.E. by E. of the cantonment of Dhárwár. The station is in the lands of the village of Navalúr, taluka and district Dhárwár.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5·1 feet high, which contains two mark-stones, one in the upper surface of the pillar and the other below; an aperture gives access to the lower mark. When visited in 1867, it is presumed from the absence of any remarks in the original records that the station was found in good order and that no alteration was made in its construction. In 1872 it was visited for Latitude Observations when the station was found intact. The approximate directions and distances of the circumjacent villages are:—Navalúr W.N.W., mile 1; Satúr S.W. by S., miles 1¼; and Rayapur S.E., miles 1¾.

XXV. Kalkera Hill Station, lat. 15° 25′, long. 74° 55′—observed at in 1866 and 1867—is situated on a hill lying immediately S. of the high road from Dhárwár to Huliyál, and about 9 miles N.E. by E. of the latter place. The station is in the lands of the village of Kalkera, taluka and district Dhárwár.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in the upper surface of the pillar and the other 4½ feet below, (the lower mark being cut on a large mass of stone buried flush with the ground); an aperture gives access to the lower mark. When visited in 1867, it is presumed from the absence of any remarks in the original records that the station was found in good order and that no alteration was made in its construction. The approximate directions and distances of the circumjacent villages are:—Kaikera N.E. by N., mile ½; Honapur N.W. by W., miles 2½; and Devgiri E.S.E., miles 1½.

XXVI. Ganigudd Hill Station, lat. 15° 15′, long. 74° 57′—observed at in 1867—is situated on a sacred hill known by the name of Ganigudd, about 6½ miles N.W. of the large village of Kalghatgi on the road between Haliyál and Taras, and 6 miles W. of the road from Dhárwár to Kalghatgi. The station is in the lands of the village of Galginkatti, taluka Kalghatgi, district Dhárwár.

The station consists of a platform 4 feet high, enclosing a circular, perforated and isolated pillar of masonry, which contains two marks, one in its upper surface and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Guladkŏp N.W. by N., miles 1½; Kudalgi S.W., miles 4; and Hasambi E.N.E., miles 2½.

XXVII. Kundgol Hill Station, lat. 15° 15′, long. 75° 17′—observed at in 1867—is situated on an elevated piece of ground on the S. side of the fort of Kundgol on the high road from Hubli to Ránebennúr and about 9 miles E.S.E. of the former place. The station is close to a Muhammadan Idgah. It is in the lands of the village of Kundgol, taluka Kundgol, district Dhárwár.

The station consists of a platform 10 feet high, enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in its upper surface and the other below; an aperture gives access to the lower mark. When visited in 1871-72 for Latitude Observations and in 1873-74 by the Levelling Party, the station was found in good preservation. The approximate directions and distances of the circumjacent villages are:—Sirúr S.E., miles 2½; Bedebal S. by E., miles 2; and Benkahalli N.E. by E., miles 3½.

XXVIII. Kánsĕrudi Hill Station, lat. 15° 12′, long. 74° 40′—observed at in 1867—is situated on a flat-topped hill about 2 miles S. of the Káli river, and 9 miles S.E. by E. of the large village of Supa. It is probably within about 15 feet of the point occupied by "Kanusirudy" of Colonel Lambton's triangulation. The station is in the lands of the village of Sambrani, taluka Supa, district North Kánara (Kánada).

The station consists of a platform of stones (supported by logs of wood) enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in its upper surface and the other 5·67 feet below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Kánsĕrudi N.E., miles 2; Kulagi S. by E., miles 3; and Manhai S.W. by W., miles 3½.

XXIX. Indúr Hill Station, lat. 15° 1′, long. 75° 5′—observed at in 1867—is situated on a moderately high hill about 1 mile E. of the village of the same name, and 2 miles N.E. of the road between the large villages of Bammigatti and Mundgod, and 5½ miles S.E. of the former. It is probably within about 20 feet of the point occupied by "Indoor" of Colonel Lambton's triangulation. The station is in the lands of the village of Indúr, taluka Yellápur, district North Kánara.

The station consists of a platform 5 feet high, enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in its upper surface and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Mafikeri E. by S., miles 1¾; Nandikatta W. by N., miles 3½; and Harshanagiri N.E. by N., miles 2.

XXX. Rámankŏp Hill Station, lat. 15° 0′, long. 74° 49′—observed at in 1867—is situated on a hill lying about a mile N. of the road from Yellápur to Mundgod and 4½ miles E.N.E. of the former place, which is on the high road from Dhárwár to Yellápur. It is probably within about 35 feet of the point occupied by "Oolakerra" of Colonel Lambton's triangulation. The station is in the lands of the village of Sahasrahalli, taluka Yellápur, district North Kánara.

The station consists of a platform of loose stones enclosing a circular, perforated and isolated pillar of masonry 5 feet high, which contains two mark-stones, one in its upper surface and the other below; an aperture gives access to the lower mark. The approximate directions and distances of the circumjacent villages are:—Ittinbail N.W. by N., miles 1¼; Samgoli W.S.W., miles 2¼; and Rámankŏp N., mile ¼.

XXXI. Bhedasgávegudda Hill Station, lat. 14° 47′, long. 74° 58′—observed at in 1867—is situated on a hill sloping up so gradually from the S. that it is practicable for carts almost to its top. It is on the road from Hisalúr to Mundgod, and about 9 miles E.N.E. of Sonda. It is probably within about 45 feet of the point occupied by "Bairdusigaon" of Colonel Lambton's triangulation. The station is in the lands of the village of Bhedasgaon, taluka Sirsi, district North Kánara.

The station consists of a platform of logs of wood (covered over with earth) enclosing a circular, perforated and isolated pillar of masonry, which is 8 feet in height above the second mark-stone. The approximate directions and distances of the circumjacent villages are:—Bhedasgávegudda S., miles 2; Togarhalli S.E. by S., miles 1½; and Hamalagarh N., miles 2½.

XXXII. Karĕkyatanhalli Hill Station, lat. 14° 40′, long. 75° 17′—observed at in 1867—is situated on a rather high isolated hill at the foot of which is the village of the same name: it lies 3 miles N.N.E. of the village of Tiluvali on the high road from Sirsi to Harihar, and 4¼ miles N.E. of Mudi on the right bank of the Varda river. The station is in the lands of the village of Karĕkyatanhalli, taluka Hángal, district Dhárwár.

The station consists of the usual platform enclosing a circular, perforated and isolated pillar of masonry, which contains three mark-stones, one in the upper surface of the pillar and the other two 5·00 and 5·88 feet respectively below it. The upper portion of the pillar, down to the second mark-stone is perforated. The directions and distances of the circumjacent villages are:—Betnalla W.S.W., miles 2; Guddada Malápur S.S.E., miles 5; Kusmur on the banks of the Varda river, E.N.E., miles 3; Malápur E.S.E., mile 1; and Honkana S.W. by W., miles 3½.

XXXIII. Menshigudda Hill Station, lat. 14° 45′, long. 74° 43′—observed at in 1867—is situated on the southern end of a very high hill which forms one of a lofty range running N. and S., about 9 miles W. of the large village of Sonda, and 5 miles S. of the Gangávali river. It is probably within about 30 feet of the point occupied by "Mainsi" of Colonel Lambton's triangulation. The station is in the lands of the village of Menshi, taluka Sirsi, district North Kánara.

The station consists of the usual platform enclosing a circular, perforated and isolated pillar of masonry, which contains three mark-stones, one in its upper surface and the others at 5 and 5·67 feet respectively below it; an aperture gives access to the second mark. The approximate directions and distances of the circumjacent villages are:—Halligudda S.W. by S., miles 4; Negse S.E., miles 5¼; and Mavinkĕre W. by S., miles 5½.

XXXIV. Chandragutti Hill Station, lat. 14° 26′, long. 74° 59′—observed at in 1867 and 1872—is situated near the N.W. corner of a small temple on the highest point of a very high hill 1¼ miles N.W. by W. of the village of Chandragutti. The hill, on which are the ruins of a very large fort, slopes up gradually from the village on the S. and falls rather abruptly about 700 feet on the N. side. It is probably within about 40 feet of the point occupied by "Chandergooty" of Colonel Lambton's triangulation. The station is in the lands of the village of Chandragutti, taluka Sŏrab, district Shimŏga (Shivamŏgga).

The station consists of a platform enclosing a circular, perforated and isolated pillar of masonry, which contains three mark-stones, one in its upper surface and the others at 5·04 and 5·67 feet respectively below it; an aperture gives access to the second mark. When visited in 1872 the station was found intact. The directions and distances of the circumjacent villages are:—Baragvali N.N.W., mile 1; Kodambi W. by N., miles 2½; Katavai S. by E., miles 2; and Yĕdgŏppa E. by N., miles 1¾.

XXXV. Halĕbail Hill Station, lat. 14° 30′, long. 74° 42′—observed at in 1867 and 1872—is situated on a hill 3 miles S. of the head of the Devimanighát on the road from Sirsi to Kumta, about 14½ miles from the former town. The hill is locally known as Bairágigudda: it rises about 500 feet above the general level of the adjoining country to the N.E.; to the S. and W. it slopes off gradually to the low country on the coast. It is probably within a few feet of the point occupied by "Byrachidonghur" of Colonel Lambton's triangulation. The station is in the lands of the village of Halĕbail, taluka Siddápur, district North Kánara.

The station consists of a platform enclosing a circular, perforated and isolated pillar of masonry, which contains three mark-stones, one in its upper surface and the other two 5 and 5·71 feet respectively below it; an aperture gives access to the second mark. When visited in 1872, the upper mark-stone was found apparently intact. The azimuths and estimated distances of the circumjacent villages are:—Bandla 173°, miles 3; Hoskera 196°, miles 4½; Tallakera 194°, mile 1; and Kesirkuni 170°, mile ¾.

XXXVI. Hukaligudda Hill Station, lat. 14° 17′, long. 74° 48′—observed at in 1872—is situated on the highest point of a range of hills skirting the north bank of the Shirávati river, about 5½ miles N.W. of the Gersŏppa falls, and ½ a mile N. of the road from Gersŏppa (Gerusŏppa) to the above named falls. It is probably within about 10 feet of the point occupied by "Hoklee Heeragooda" of Colonel Lambton's triangulation. The station is in the lands of the village of Alhalli, taluka Siddápur, district North Kánara.

The station consists of a platform of stones enclosing a circular, perforated and isolated pillar of masonry, which contains three mark-stones, one in its upper surface, the second 4·75 feet below and the third below the second; an aperture gives access to the second mark. The azimuths and estimated distances of the circumjacent places are:—Itige (spire of temple) 198°, miles 4; Kanhalli 230°, mile ¾; Bongiri 233°, miles 7; and Bailhalli 233°, miles 3.

XXXVII. Kaltigudda Hill Station, lat. 14° 22′, long. 74° 35′—observed at in 1872—is situated on the highest point of a group of hills rising about 2200 feet above the village of Sálakoru, from which there is a commanding view all round, about 3 miles S. of the road from Siddápur to Kumta on the sea coast, and 10 miles N.E. of the town of Honávar. The station is probably within about 20 feet of the point occupied by "Kulteegooda" of Colonel Lambton's triangulation. It is in the lands of the village of Hodke, taluka Honávar, district North Kánara.

The station consists of a platform of earth and stones enclosing a circular, perforated and isolated pillar of masonry, which contains two mark-stones, one in its upper surface and the other 5 feet below it; an aperture gives access to the lower mark. The approximate directions and distances of the following villages (though none are visible from the station) are:—Chandávar W.N.W., miles 4¾; Dávali N., miles 3½; and Kundbálla S., miles 4½.

XXXVIII. Dindĕmane Hill Station, lat. 14° 8′, long. 74° 43′—observed at in 1873—(also called Chikkadhalligudda) is on a peak of the Western Gháts which closely overlooks the low country and the coast line to the west. The station is easily approached from the village of Kanúr near the head of the Govardhangiri pass, and lies about 6½ miles S. of the ruins of Gersŏppa on the Shirávati river. It is identical with "Dindimunnee" station of Colonel Lambton's triangulation, the mark of which was found engraved on the rock and adopted for the lower mark of the present station. The station is in the lands of the village of Kanúr, taluka Ságar, district Shimŏga.

The station consists of a platform of earth and stones about 12 feet square, enclosing a circular, perforated and isolated pillar of masonry 5 feet high and 3 feet in diameter, which contains two marks, one on a stone embedded in the upper surface of the pillar and the other engraved on the rock at the ground level; an aperture gives access to the lower mark. The directions and distances of the circumjacent villages are:—Govardhangiri Drug N.N.W., miles 3¼; Kanúr N.E. by E., miles 1¾; Samane W.N.W., miles 1½; Chikkadhalli S., miles 1½; and Huralgal N., miles 1½.

XXXIX. Koramúr Hill Station, lat. 14° 8′, long. 75° 1′—observed at in 1873—(locally known as Koramúr Kota) is situated on a somewhat isolated peak rising about 500 feet above its base, towards the eastern part of the Talguppe-Ikkeri range. It is 4½ miles W.S.W. of the town of Ságar, and 2¾ miles S.W. by S. of Kugavi village on the road from Talguppe to Ságar. The station is identical with "Koramoorgooda" station of Colonel Lambton's triangulation, the mark of which was found engraved on the rock and adopted as the lower mark of the present station. The station is in the lands of the village of Nijagar Khandaka, taluka Ságar, district Shimŏga.

The station consists of a platform of earth and stones about 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter and 3 feet high; there are two marks, one on a stone imbedded in the upper surface of the pillar and the other below it engraved on the rock *in sitû*. The directions and estimated distances of the circumjacent villages are:—Tumbi S.S.W., mile ¾; Dombe N. by E., miles 1¾; Shervanti (on the road from Talguppe to Ságar) N. by W., miles 3; and Bálehalli E. by S., mile 1.

XL. Hŏnnavalli Hill Station, lat. 14° 17′, long. 75° 13′—observed at in 1872 and 1873—is situated on the western point of a short ridge forming part of a chain of hills running almost parallel to and at a distance of nearly 2 miles S.E. of the road from Ságar to Sirálkŏppa, and about 4½ miles E. of the large village of Ulavi at the junction of the above mentioned road with one from the town of Sŏrab. It is identical with the station of "Hoonavully or Gootygooda" of Colonel Lambton's triangulation, the mark of which was found engraved on the rock and adopted as the lower mark of the present station. The station is in the lands of the village of Hŏnnavalli, taluka Sŏrab, district Shimŏga.

The station consists of a platform of earth and stones enclosing a solid, circular and isolated pillar of masonry; there are three marks, the first on a stone imbedded in the upper surface of the pillar, the second 1·46 feet below it and the third on the rock 3·17 feet below the second. The directions and distances of the circumjacent villages are:—Kánhalli W. by S., miles 2¼; Kanúr N.W. by W., miles 1½; Hŏnnavalli N.W. by N., mile 1; Hŏsúr N.N.W., miles 1⅞; Indvalli N.E. by N., miles 1⅞; and Guttanhalli S.E., miles 2.

XLI. Hugadi Hill Station, lat. 13° 54′, long. 75° 14′—observed at in 1873—is situated on the highest and south-easternmost point of a hill rising about 800 feet above its base, 3½ miles N.W. by W. of Humchikatte on the road from Tirthahalli to Shimŏga, and 3 miles S.E. by E. of Kodúr. It is identical with the station of "Hoogadeegooda" of Colonel Lambton's triangulation, the mark of which was found and adopted as the lower mark of the present station. The station is in the lands of the village of Hugadi, taluka Nagar, district Shimŏga.

The station consists of a platform of earth and stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains three marks, one in the upper surface of the pillar and the other two at 1·67 and 3·84 feet respectively below it. The directions and distances of the circumjacent villages are:—Mallalikŏppa E.S.E., miles 1⅞; Kargarsu N.N.E., miles 1½; Hugadi E. by S., miles 1¼; Kadeshakvalli N.W. by W., mile 1; and Mallúr S.W. by W., miles 1¼.

XLII. Kŏdashádri Hill Station, lat. 13° 51′, long. 74° 55′—observed at in 1873—is situated on the Shikhara or head of the great hill of this name of the Western Gháts, on the boundary of South Canara (Kánada) and Mysore (Maisúr), 3⅜ miles S.S.E. of the traveller's bungalow at Nágodi on the high road from the Kŏlurghát to Kolúrkatte. The station is 13·7 feet N. of the north wall of the Shikhara temple (a stone building occupying the centre of the peak), and about 25 feet E.N.E. of the centre of an old platform and pile of earth and stones supposed to be the site of the station of "Kodaichee Puwudum" of Colonel Lambton's triangulation; this old platform has been removed and a rough stone mark set in mortar has been erected in its place. The station is in the lands of the village of Vallurmane, taluka Ságar, district Shimŏga.

The station consists of a platform of earth and stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one imbedded in the upper surface of the pillar and the other set in the laterite rock 2·54 feet below it. The directions and distances of the circumjacent villages are:—Walúr N., miles 1⅜; Bilikal S.E. by S., miles 2¼; and Bacheri N.W. by N., miles 2.

XLIII. Siddeshvar Hill Station, lat. 13° 41′, long. 75° 16′—observed at in 1873—is situated on the highest part of a rocky hill rising about 400 feet above its base, about a mile W. of the town of Tirthahalli on the high road from Mangalore (Mangalúr) to Shimŏga. The station is 431 feet E.N.E. of the small dilapidated temple near the western end of the summit. No trace of Colonel Lambton's station "Sidaeshwaragooda" was found. The station is in the lands of the village of Surali Balĕbail, taluka Kavaledurga, district Shimŏga.

The station consists of a platform of earth and stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 2·27 feet below it at the ground level. The directions and distances of the circumjacent villages are:—Mulbagal W.S.W., miles 2; Tumadi S., mile 1; Bintalla W., miles 1½; and Surali W.N.W., mile ½.

XLIV. Bisale Hill Station, lat. 13° 35′, long. 75° 5′—observed at in 1873—is situated on the summit of a bare hill of the Western Gháts immediately overlooking the country and the sea coast to the west, about 6 miles N.W. by W. of the travellers' bungalow at Agumbe (Águmbi) on the high road from Mangalore to Shimŏga, and 16 miles S.W. by W. of the town of Tirthahalli on the same road. It is identical with the station of "Bisslygooda" of Colonel Lambton's triangulation, the mark-stone of which was found and adopted as the lower mark of the present station. The station is in the lands of the village of Hŏsúr, taluka Kavaledurga, district Shimŏga.

The station consists of a platform of earth and stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·94 feet below it. The directions and distances of the circumjacent villages are (though none are visible from the station):—Kaivakikĕre S.E. by S., miles 4½; Yĕlĕmane E. by N., miles 5; and Malki N.E., miles 4½.

XLV. Hirĕgudda Hill Station, lat. 13° 24′, long. 75° 27′—observed at in 1873—is situated on the southernmost and highest point of a range of hills running northwards from the Sita stream, about 2 miles E. of the travellers' bungalow at Sulibĕle on the road between Bálĕhŏnnúr and Hariharpur, and 5 miles S.E. by E. of Baggunji. The station is 16 feet S.E. of the highest rock on the summit. It is in the lands of the village of Hirĕgudda, taluka Kŏppa, district Kadúr.

The station consists of a platform of earth and stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·9 feet below it. The directions and distances of the circumjacent villages are:—Hirĕgudda E. by S., mile ¾; Álageshvara W.N.W., miles 1½; and Sunkargudda S., mile 1.

XLVI. Hĕbbe Hill Station, lat. 13° 32′, long. 75° 38′—observed at in 1873—is situated on the extreme western peak of the northern bend of the horse shoe formed by the Chandradrona (commonly called the Bábá Budan) range of hills. It lies 2 miles E. by N. of the travellers' bungalow at Hĕbbe on the high road from Yĕdĕhalli to Chikmagalúr. The station is in the lands of the village of Hĕbbe, taluka Lakvalli, district Kadúr.

The station consists of a platform of earth and stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in situ* and the other 0·98 of a foot above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Kargal S. by E., miles 1½; Hippala S.E., miles 2; Karivani E., miles 3¼; and Kármati N.W. by W., miles 2¼.

XLVII. Valkunji Hill Station, lat. 13° 21′, long. 75° 7′—observed at in 1873—is situated on the conspicuous peak immediately above the Andár pass, about 9 miles S.W. by W. of Kigga, and 13 miles W.S.W. of the large village of Sringeri. The station is in the lands of the village of Vurvani, taluka Kŏppa, district Kadúr.

The station consists of a platform of earth and stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·42 feet below it at the ground level. The directions and distances of the circumjacent villages are:—Arane S.E. by E., miles 2¼; Kĕre E. by S., miles 4½; and Karuchar E., miles 3½.

III.—(*Of the Madras Longitudinal Series*). Kudurĕmukha Hill Station, lat. 13° 8′, long. 75° 18′—observed at in 1872 and 1873—is situated on the highest point of the lofty group of peaks, which stands out prominently from the Western Gháts; the peak on which the principal station is fixed is called "Funk Point" by the district officers and the residents of Mangalore, the former of whom have built a bungalow about a mile E.N.E., some 20 minutes' walk from the station. Another peak ¾ of a mile to the E. by S. of the present station, called "Mukh Head", was originally adopted as a station and built upon but was abandoned as being unsuitable for connecting the Mangalore Meridional and the Madras Longitudinal Series. The peak called Pándukal by the Natives and "Midge Point" by the Europeans, is a mile W. by N. and has been fixed as a secondary station and marked by a circle and dot engraved on the rock. These three peaks are on the ridge or watershed of the mountain which is the boundary between South Canara and Mysore. The station is most easily reached from the town of Bellat Angádi by a cart road 7½ miles to Nágúr at the E.S.E. foot of the mountain, whence the ascent, about 5,600 feet, is made by a well traced bridle path of 12½ miles to the bungalow above mentioned. The station is in the lands of the village of Samse, taluka Vastára, district Kadúr.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·21 feet below it. When again visited in 1873, it is presumed from the absence of any remarks in the original records that the station was found in good order and no alteration in its construction was made. The directions and distances of the circumjacent villages are:—Allat Angádi S.S.W., miles 6½; Bangavádi E.S.E., miles 7¼; Jamalabad S. by E., miles 7½; and Bangár E. by N., miles 2¾.

VI.—(*Of the Madras Longitudinal Series*). Ánúr or Rangaswámigiri Hill Station, lat. 13° 19′, long. 75° 42′—observed at in 1872 and 1873—is situated on the southernmost peak of the Madlakal group of hills, 2 or 3 miles W.N.W., of Ánúr on the road from Múdagĕre to Yĕdĕhalli, 8 miles W. of the town of Chikmagalúr, and 4¾ miles N.W. of Vastára. A cart road from Chikmagalúr and Vastára runs to Ánúr, whence the ascent to the station of about 3,000 feet is made by a foot and bridle path through the Basgodu Coffee estate. The station is in the lands of the village of Hanucharvalli, taluka Chikmagalúr, district Kadúr.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in situ* and the other 2·23 feet above it on a stone imbedded in the upper surface of the pillar. When revisited in 1873, the station was found in a good state of preservation and no alteration in its construction appears to have been made. The directions and distances of the circumjacent villages are:—Kashige W. by S., miles 1½; Koligunhalli S.E., mile ¾; Mávinguri S.S.W., mile ¾; and Baigúr W. by N., miles 1¼.

April, 1888.

M. W. ROGERS,
In charge Computing Office.

MANGALORE MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION. OBSERVED ANGLES.

At XVII (Kem)

**February and March* 1863; *and* †*February* 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on II (Sulki)										M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	
† II (Sulki) and I (Kalas)	" h 22·96 h 23·98	" h 23·44 h 23·56	" h 21·24 h 20·28	" h 21·32 h 21·44	" h 20·38 h 20·44	" h 21·60 h 22·70	" h 23·20 h 22·46	" h 21·76 h 22·18	" l 26·72 l 26·06	" l 23·52 l 23·92	$M = 22''\cdot66$ $w = 2\cdot80$ $\frac{1}{w} = 0\cdot36$
	23·47	23·50	20·76	21·38	20·41	22·15	22·83	21·97	26·39	23·72	$C = 43^\circ\,18'\,22''\cdot66$
	Circle readings, telescope being set on I (Kalas)										
	124° 55′	304° 55′	168° 7′	348° 8′	211° 19′	31° 19′	254° 31′	74° 31′	297° 43′	117° 43′	$M = 8''\cdot84$
* I (Kalas) and XIX (Alsunda)	" h 8·02 h 8·46	" l 10·28 l 9·86	" l 8·54 l 7·66	" h 10·98 h 10·68	" h 7·72 h 8·00	" h 7·52 h 8·94	" h 11·66 h 11·92	" h 9·34 h 10·36	" l 9·32 l 7·92	" l 5·32 l 4·30	$w = 2\cdot60$ $\frac{1}{w} = 0\cdot38$ $C = 46^\circ\,26'\,8''\cdot84$
	8·24	10·07	8·10	10·83	7·86	8·23	11·79	9·85	8·62	4·81	

Note.—Stations XVII (Kem) and XIX (Alsunda) appertain to the Bombay Longitudinal Series.

At XIX (Alsunda)

March 1863; *observed by Captain C. T. Haig, R.E., with Barrow's 24-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XVII (Kem)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	133° 18′	313° 18′	176° 30′	356° 31′	219° 42′	39° 42′	262° 54′	82° 55′	306° 6′	126° 6′	
XVII (Kem) and I (Kalas)	″ h 38·84 h 40·64	″ h 37·60 h 38·74	″ h 38·72 h 39·88	″ h 40·92 h 41·48	″ h 37·06 h 36·92	″ h 36·56 h 38·26	″ h 37·78 h 38·78	″ h 40·10 h 38·52	″ h 36·90 h 38·74	″ h 40·76 h 39·26	$M = 38''\cdot82$ $w = 5\cdot10$ $\frac{1}{w} = 0\cdot20$ $C = 77^\circ\ 21'\ 38''\cdot82$
	39·74	38·17	39·30	41·20	36·99	37·41	38·28	39·31	37·82	40·01	
I (Kalas) and XXII (Bori)	h 60·42 h 60·04	h 57·74 h 57·10	h 59·98 h 60·20	h 58·98 h 59·54	h 58·56 h 59·66	h 60·42 h 58·58	h 60·30 h 59·38	h 58·68 h 59·60	h 61·42 h 60·04	h 59·66 h 59·84	$M = 59''\cdot51$ $w = 10\cdot70$ $\frac{1}{w} = 0\cdot93$ $C = 54^\circ\ 48'\ 59''\cdot51$
	60·23	57·42	60·09	59·26	59·11	59·50	59·84	59·14	60·73	59·75	

At XXII (Bori)

**April* 1863; *and* †*February* 1865; *observed by Captain C. T. Haig, R.E., with Barrow's 24-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XIX (Alsunda)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	
* XIX (Alsunda) and I (Kalas)	″ h 24·22 h 24·32 h 23·30	″ h 23·08 h 24·22	″ h 24·22 h 24·48	″ h 23·60 h 24·50	″ h 25·22 h 25·50	″ h 23·72 h 23·74	″ h 23·10 h 23·36	″ h 23·82 h 23·30	″ h 24·76 h 24·54	″ h 23·58 l 24·44	$M = 24''\cdot05$ $w = 23\cdot41$ $\frac{1}{w} = 0\cdot04$ $C = 58^\circ\ 53'\ 24''\cdot05$
	23·95	23·65	24·35	24·05	25·36	23·73	23·23	23·56	24·65	24·01	
	Circle readings, telescope being set on I (Kalas)										
	0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	
† I (Kalas) and III (Palvan)	″ l 19·10 l 19·16	″ l 17·00 l 16·82	″ l 19·80 l 22·10	″ l 17·86 l 20·08	″ l 21·00 l 19·92	″ l 19·68 l 18·74	″ l 18·58 l 18·50	″ l 19·54 l 17·46	″ l 18·10 l 19·04	″ l 20·56 l 19·50	$M = 19''\cdot13$ $w = 6\cdot40$ $\frac{1}{w} = 0\cdot16$ $C = 52^\circ\ 51'\ 19''\cdot13$
	19·13	16·91	20·95	18·97	20·46	19·21	18·54	18·50	18·57	20·03	

NOTE.—Stations XVII (Kem), XIX (Alsunda) and XXII (Bori) appertain to the Bombay Longitudinal Series.

At I (Kalas)

‡*April* 1863; *and* §*February* 1865; *observed by Captain C. T. Haig, R.E., with Barrow's 24-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XVII (Kem) 122° 30′	302° 30′	165° 43′	345° 43′	208° 54′	28° 54′	252° 6′	72° 6′	295° 18′	115° 18′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XVII§ (Kem) and II (Sulki)	″ h 33·90 h 34·08	″ h 38·80 h 38·16	″ l 36·90 l 37·10	″ l 33·88 l 34·82	″ l 35·52 l 37·24	″ l 37·14 l 35·90	″ l 28·52 l 30·06	″ l 33·22 l 33·64	″ h 35·50 h 35·36	″ h 35·56 h 35·26	$M = 35''\cdot03$ $w = 1\cdot50$ $\frac{1}{w} = 0\cdot65$ $C = 84^\circ\,36'\,35''\cdot03$
	33·99	38·48	37·00	34·35	36·38	36·52	29·29	33·43	35·43	35·41	
II§ (Sulki) and III (Palvan)	h 31·82 h 31·74	h 32·22 h 30·58	l 31·00 l 30·26	l 30·82 l 32·22	l 31·18 l 30·76	l 31·54 l 32·24	l 35·62 l 34·28	l 33·88 l 34·74	h 29·58 h 31·24	h 32·30 h 32·94	$M = 32''\cdot05$ $w = 4\cdot10$ $\frac{1}{w} = 0\cdot24$ $C = 57^\circ\,56'\,32''\cdot05$
	31·78	31·40	30·63	31·52	30·97	31·89	34·95	34·31	30·41	32·62	
III§ (Palvan) and XXII (Bori)	h 56·66 h 56·88	h 54·26 h 56·14	l 57·54 l 58·88	l 58·30 l 57·62	l 56·80 l 56·34	l 57·26 l 55·68	l 55·94 h 54·50	l 56·90 l 56·84	h 59·46 h 59·86	h 57·70 h 57·38	$M = 57''\cdot05$ $w = 5\cdot00$ $\frac{1}{w} = 0\cdot20$ $C = 94^\circ\,56'\,57''\cdot05$
	56·77	55·20	58·21	57·96	56·57	56·47	55·22	56·87	59·66	57·54	
	Circle readings, telescope being set on XXII (Bori) 237° 30′	57° 30′	280° 43′	100° 43′	323° 54′	143° 54′	7° 7′	187° 7′	50° 18′	230° 18′	
XXII‡ (Bori) and XIX (Alsunda)	″ h 40·84 h 39·94	″ h 41·50 h 40·60	″ h 37·42 h 37·90	″ h 41·86 h 41·14	″ h 38·64 h 37·38	″ h 35·26 h 35·98	″ h 40·70 h 40·38	″ h 39·62 h 40·76	″ h 38·00 h 37·06	″ h 38·88 h 37·58	$M = 39''\cdot07$ $w = 2\cdot60$ $\frac{1}{w} = 0\cdot38$ $C = 66^\circ\,17'\,39''\cdot07$
	40·39	41·05	37·66	41·50	38·01	35·62	40·54	40·19	37·53	38·23	

At II (Sulki)

February 1865; *observed by Captain C. T. Haig, R.E., with Barrow's 24-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on V (Katphal) 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
V (Katphal) and IV (Páchvad)	″ h 43·86 h 45·16	″ h 46·02 h 44·08	″ l 48·68 l 47·22	″ l 44·84 l 44·02	″ h 42·30 h 42·70	″ h 43·92 l 44·12	″ l 44·20 l 43·58	″ l 45·44 l 45·94	″ h 44·40 h 43·98	″ h 42·20 h 41·58	$M = 44''\cdot41$ $w = 3\cdot40$ $\frac{1}{w} = 0\cdot29$ $C = 74^\circ\,57'\,44''\cdot41$
	44·51	45·05	47·95	44·43	42·50	44·02	43·89	45·69	44·19	41·89	

Note.—Stations XVII (Kem), XIX (Alsunda) and XXII (Bori) appertain to the Bombay Longitudinal Series.

At II (Sulki)—(*Continued*).

Angle between	Circle readings, telescope being set on V (Katphal) 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
IV (Páchvad) and III (Palvan)	h 19·84	h 17·02	l 15·70	l 17·20	h 20·64	h 18·36	l 16·86	l 14·90	h 18·34	h 18·32	M = 17″·86
	h 18·38	h 19·04	l 15·84	l 18·20	h 20·80	h 18·00	l 17·06	l 15·78	h 18·46	h 18·42	w = 3·90; $\frac{1}{w}$ = 0·26
	19·11	18·03	15·77	17·70	20·72	18·18	16·96	15·34	18·40	18·37	C = 58° 24′ 17″·86
III (Palvan) and I (Kalas)	h 9·86	h 11·66	l 12·04	l 11·02	h 10·84	h 9·88	l 9·66	l 13·58	h 10·10	h 10·66	M = 10″·73
	h 10·04	h 10·94	l 11·96	l 10·16	h 9·86	l 10·30	l 10·08	l 11·98	h 8·86	h 11·02	w = 8·60; $\frac{1}{w}$ = 0·12
	9·95	11·30	12·00	10·59	10·35	10·09	9·87	12·78	9·48	10·84	C = 71° 10′ 10″·73
I (Kalas) and XVII (Kem)	h 7·98	h 9·38	l 8·92	l 9·90	h 7·76	h 11·16	l 4·64	l 7·28	h 9·76	h 7·84	M = 8″·48
	h 8·14	h 8·36	l 8·42	l 9·92	h 7·68	l 10·10	l 4·92	l 8·92	h 11·20	h 7·38	w = 3·30; $\frac{1}{w}$ = 0·30
	8·06	8·87	8·67	9·91	7·72	10·63	4·78	8·10	10·48	7·61	C = 52° 5′ 8″·48

At III (Palvan)

February 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXII (Bori) 181° 12′	1° 12′	224° 24′	44° 24′	267° 36′	87° 36′	310° 48′	130° 48′	353° 59′	173° 59′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXII (Bori) and I (Kalas)	h 52·06	h 49·02	h 49·60	h 49·34	h 50·12	h 47·16	h 47·92	h 51·08	h 48·08	h 50·04	M = 49″·52
	h 52·42	h 50·20	h 50·88	h 50·48	h 48·40	h 47·32	h 47·56	h 49·66	h 48·64	h 50·44	w = 4·40; $\frac{1}{w}$ = 0·23
	52·24	49·61	50·24	49·91	49·26	47·24	47·74	50·37	48·36	50·24	C = 32° 11′ 49″·52
I (Kalas) and II (Sulki)	h 20·02	h 21·54	l 21·54	l 21·52	h 21·94	l 23·60	h 20·28	l 22·06	h 22·82	h 22·14	M = 21″·67
	h 18·64	h 21·18	l 20·98	l 21·44	h 23·48	l 23·38	h 21·24	l 20·56	h 22·30	h 22·66	w = 6·70; $\frac{1}{w}$ = 0·15
	19·33	21·36	21·26	21·48	22·71	23·49	20·76	21·31	22·56	22·40	C = 50° 53′ 21″·67
II (Sulki) and IV (Páchvad)	h 42·94	h 43·12	l 41·94	l 43·28	h 43·18	l 41·52	h 44·28	l 42·02	h 40·58	h 40·66	M = 42″·41
	h 44·08	h 43·62	l 42·18	l 43·44	h 42·44	l 41·20	h 43·34	l 43·60	h 40·40	h 40·38	w = 6·20; $\frac{1}{w}$ = 0·16
	43·51	43·37	42·06	43·36	42·81	41·36	43·81	42·81	40·49	40·52	C = 46° 45′ 42″·41

NOTE.—Stations XVII (Kem) and XXII (Bori) appertain to the Bombay Longitudinal Series.

At III (Palvan)—(*Continued*).

Angle between	Circle readings, telescope being set on XXII (Bori) 181° 12′	1° 12′	224° 24′	44° 24′	267° 36′	87° 36′	310° 48′	130° 48′	353° 59′	173° 59′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
IV (Páchvad)	h 31·04 ″	h 31·36 ″	l 33·48 ″	l 32·08 ″	h 31·44 ″	h 31·90 ″	h 31·00 ″	l 31·10 ″	h 31·68 ″	h 31·92 ″	$M = 31''·61$
and	h 30·90	h 30·90	l 32·68	l 31·66	h 31·30	l 31·20	h 30·28	l 30·96	h 32·76	h 32·62	$w = 16·60$
VI (Aundh)	30·97	31·13	33·08	31·87	31·37	31·55	30·64	31·03	32·22	32·27	$\frac{1}{w} = 0·06$
											$C = 48° 57' 31''·61$

At IV (Páchvad)

March 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24*-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on R. M. 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
R. M.	h 44·12 ″	l 42·12 ″	h 43·98 ″	h 42·36 ″	h 43·48 ″	h 42·96 ″	h 42·96 ″	h 43·30 ″	h 43·24 ″	h 40·84 ″	$M = 43''·10$
and	h 43·48	l 43·12	h 43·32	h 42·96	h 43·36	h 43·54	h 44·30	h 44·80	h 41·92	h 41·84	$w = 12·80$
VII (Palsi)	43·80	42·62	43·65	42·66	43·42	43·25	43·63	44·05	42·58	41·34	$\frac{1}{w} = 0·08$
											$C = 1° 8' 43''·10$
VII (Palsi)	h 47·04	l 50·16	h 46·18	h 48·32	h 48·68	h 48·34	h 48·00	h 48·18	h 49·14	h 50·58	$M = 48''·48$
and	h 48·38	l 50·14	h 47·18	h 47·40	h 48·90	h 49·46	h 46·48	h 47·82	h 50·04	h 49·08	$w = 6·80$
VIII (Kundal)	47·71	50·15	46·68	47·86	48·79	48·90	47·24	48·00	49·59	49·83	$\frac{1}{w} = 0·15$
											$C = 61° 26' 48''·48$
VIII (Kundal)	h 26·90	l 25·28	h 28·18	h 26·00	h 26·48	h 27·36	h 26·68	h 27·84	h 24·72	h 26·10	$M = 26''·65$
and	h 27·40	l 24·98	h 27·70	h 28·76	h 27·76	h 25·48	h 26·30	h 26·70	h 25·58	h 26·86	$w = 11·20$
VI (Aundh)	27·15	25·13	27·94	27·38	27·12	26·42	26·49	27·27	25·15	26·48	$\frac{1}{w} = 0·09$
											$C = 64° 49' 26''·65$
VI (Aundh)	h 42·42	l 41·84	h 40·34	h 40·54	h 40·96	h 40·28	h 40·62	h 39·68	h 41·90	h 43·06	$M = 41''·06$
and	h 41·66	l 41·26	h 39·82	h 39·06	h 39·12	h 41·50	h 42·18	h 39·96	h 42·30	h 42·68	$w = 8·10$
III (Palvan)	42·04	41·55	40·08	39·80	40·04	40·89	41·40	39·82	42·10	42·87	$\frac{1}{w} = 0·12$
											$C = 49° 28' 41''·06$
III (Palvan)	h 3·10	l 3·62	h 4·92	h 3·96	h 2·68	h 5·62	h 3·34	h 2·80	h 2·48	h 4·08	$M = 3''·70$
and	h 2·98	l 4·20	h 4·42	h 4·10	h 3·38	h 4·46	h 3·66	h 3·70	h 3·08	h 3·44	$w = 17·00$
II (Sulki)	3·04	3·91	4·67	4·03	3·03	5·04	3·50	3·25	2·78	3·76	$\frac{1}{w} = 0·06$
											$C = 74° 50' 3''·70$

NOTE.—Station XXII (Bori) appertains to the Bombay Longitudinal Series. R. M. denotes Referring Mark.

At IV (Páchvad)—(*Continued*).

Angle between	Circle readings, telescope being set on R. M. 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
II (Sulki) and V (Katphal)	h 58·04	h 58·54	h 60·44	h 59·72	h 61·92	h 59·02	h 61·18	h 62·10	h 61·58	h 59·04	$M = 60''\cdot04$
	h 58·24	h 58·28	h 60·54	h 60·06	h 62·36	h 59·46	h 59·46	h 60·34	h 61·78	h 58·64	$w = 5\cdot00$; $\frac{1}{w} = 0\cdot20$
	58·14	58·41	60·49	59·89	62·14	59·24	60·32	61·22	61·68	58·84	$C = 41^\circ\ 38'\ 0''\cdot04$

At V (Katphal)

March 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on VII (Palsi) 241° 1′	61° 1′	284° 13′	104° 13′	327° 24′	147° 24′	10° 37′	190° 37′	53° 48′	233° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VII (Palsi) and IV (Páchvad)	l 3·82	l 4·78	l 3·98	l 4·50	l 4·34	l 4·78	l 3·96	l 5·26	l 5·10	l 5·10	$M = 4''\cdot55$
	l 3·68	l 4·90	l 3·14	l 4·08	l 6·14	l 4·46	l 4·86	l 5·46	l 3·80	l 4·80	$w = 23\cdot30$; $\frac{1}{w} = 0\cdot04$
	3·75	4·84	3·56	4·29	5·24	4·62	4·41	5·36	4·45	4·95	$C = 55^\circ\ 35'\ 4''\cdot55$
IV (Páchvad) and II (Sulki)	l 19·52	l 18·66	l 20·80	l 20·20	l 17·56	l 20·12	l 18·96	l 17·62	l 19·64	l 19·72	$M = 19''\cdot25$
	l 19·18	l 18·72	l 20·24	l 19·42	l 16·32	l 20·14	l 18·74	l 18·16	l 20·50	l 20·76	$w = 7\cdot20$; $\frac{1}{w} = 0\cdot14$
	19·35	18·69	20·52	19·81	16·94	20·13	18·85	17·89	20·07	20·24	$C = 63^\circ\ 24'\ 19''\cdot25$

At VI (Aundh)

March 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on III (Palvan) 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 47′	352° 47′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
III (Palvan) and IV (Páchvad)	h 50·60	h 48·50	h 48·94	h 49·94	h 49·78	h 48·56	l 47·32	l 48·62	l 47·32	l 48·94	$M = 48''\cdot84$
	h 50·10	h 49·90	h 48·44	h 49·18	h 50·42	l 49·22	l 48·00	l 48·78	l 45·94	l 48·38	$w = 7\cdot70$; $\frac{1}{w} = 0\cdot13$
	50·35	49·20	48·69	49·56	50·10	48·89	47·66	48·70	46·63	48·66	$C = 81^\circ\ 33'\ 48''\cdot84$
IV (Páchvad) and VIII (Kundal)	h 27·68	h 25·94	h 26·16	h 26·08	h 26·56	h 27·88	l 26·74	l 26·82	l 26·82	l 27·56	$M = 26''\cdot91$
	h 27·06	h 24·30	h 26·44	h 26·28	h 26·46	l 27·74	l 26·82	l 27·22	l 28·86	l 28·80	$w = 10\cdot20$; $\frac{1}{w} = 0\cdot10$
	27·37	25·12	26·30	26·18	26·51	27·81	26·78	27·02	27·84	28·18	$C = 77^\circ\ 21'\ 26''\cdot91$

NOTE.—R. M. denotes Referring Mark.

At VII (Palsi)

March 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24*-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on X (Daphlápur) 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
X (Daphlápur) and IX (Dandoba Dongar)	h 50·58	h 50·48	h 51·08	h 50·24	h 49·48	h 49·38	h 49·04	h 47·00	h 52·00	h 49·12	$M = 50''\cdot02$
	h 50·80	h 52·44	h 50·36	h 49·46	h 50·68	h 48·24	h 48·90	h 49·18	h 52·90	h 49·00	$w = 5\cdot10$
	50·69	51·46	50·72	49·85	50·08	48·81	48·97	48·09	52·45	49·06	$\frac{1}{w} = 0\cdot20$; $C = 72^\circ\ 34'\ 50''\cdot02$
IX (Dandoba Dongar) and VIII (Kundal)	h 33·14	h 32·94	h 33·52	h 31·48	h 34·94	h 34·20	h 34·60	h 32·80	h 32·58	h 32·94	$M = 32''\cdot92$
	h 31·84	h 31·80	h 32·80	h 30·30	h 33·86	h 35·84	h 34·20	h 31·88	h 30·96	h 31·68	$w = 5\cdot20$
	32·49	32·37	33·16	30·89	34·40	35·02	34·40	32·34	31·77	32·31	$\frac{1}{w} = 0\cdot19$; $C = 61^\circ\ 35'\ 32''\cdot92$
VIII (Kundal) and IV (Páchvad)	h 27·56	h 28·28	h 27·98	h 27·86	h 26·88	h 26·70	h 27·48	h 27·64	h 25·90	h 26·96	$M = 27''\cdot41$
	h 28·06	h 29·56	h 27·48	h 28·94	h 28·46	h 25·22	h 27·26	h 26·20	h 26·64	h 27·04	$w = 10\cdot40$
	27·81	28·92	27·73	28·40	27·67	25·96	27·37	26·92	26·27	27·00	$\frac{1}{w} = 0\cdot10$; $C = 72^\circ\ 40'\ 27''\cdot41$
IV (Páchvad) and V (Katphal)	h 55·60	h 56·38	h 58·14	h 58·06	h 57·86	h 57·92	h 56·46	h 58·66	h 59·56	h 58·36	$M = 57''\cdot72$
	h 55·22	h 54·68	h 57·94	h 57·94	h 57·26	h 58·74	h 57·86	h 59·40	h 59·52	h 58·88	$w = 5\cdot10$
	55·41	55·53	58·04	58·00	57·56	58·33	57·16	59·03	59·54	58·62	$\frac{1}{w} = 0\cdot20$; $C = 56^\circ\ 37'\ 57''\cdot72$

At VIII (Kundal)

March 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24*-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on VI (Aundh) 182° 26′	2° 26′	225° 38′	45° 38′	268° 50′	88° 50′	312° 2′	132° 2′	355° 13′	175° 13′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VI (Aundh) and IV (Páchvad)	h 9·46	h 9·04	h 8·96	h 11·14	h 8·78	h 7·62	h 11·72	h 10·70	h 11·42	l 11·10	$M = 9''\cdot91$
	h 10·06	h 9·04	h 9·76	h 9·62	h 10·26	h 8·30	h 10·06	h 10·56	h 10·38	l 10·28	$w = 9\cdot40$
	9·76	9·04	9·36	10·38	9·52	7·96	10·89	10·63	10·90	10·69	$\frac{1}{w} = 0\cdot11$; $C = 37^\circ\ 49'\ 9''\cdot91$
IV (Páchvad) and VII (Palsi)	h 49·22	h 48·00	h 51·14	h 49·52	h 49·58	h 49·94	h 50·44	h 50·68	h 47·22	l 49·52	$M = 49''\cdot51$
	h 49·44	h 48·00	h 49·68	h 50·86	h 49·30	h 49·58	h 50·04	h 50·02	h 48·54	l 49·48	$w = 10\cdot80$
	49·33	48·00	50·41	50·19	49·44	49·76	50·24	50·35	47·88	49·50	$\frac{1}{w} = 0\cdot09$; $C = 45^\circ\ 52'\ 49''\cdot51$

At VIII (Kundal)—(*Continued*).

March 1865; *and November* 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on VI (Aundh) 182° 26′	2° 26′	225° 38′	45° 38′	268° 50′	88° 50′	312° 2′	132° 2′	355° 13′	175° 13′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
* VII (Palsi) and IX (Dandoba Dongar)	″ *h* 49·46 *h* 49·48	″ *h* 51·08 *h* 48·52	″ *l* 48·14 *l* 49·48	″ *l* 50·26 *l* 49·36	″ *l* 47·70 *l* 48·52	″ *l* 49·84 *l* 49·44	″ *l* 48·66 *l* 48·92	″ *l* 50·46 *l* 50·82	″ *l* 49·90 *l* 49·44	″ *l* 48·72 *l* 48·14	$M = 49''.32$ $w = 13.90$ $\frac{1}{w} = 0.07$ $C = 43° 7' 49''.32$
	49·47	49·80	48·81	49·81	48·11	49·64	48·79	50·64	49·67	48·43	
* IX (Dandoba Dongar) and XII (Majala)	*h* 25·48 *h* 25·70	*h* 24·86 *h* 25·00	*l* 23·68 *l* 23·80	*l* 25·06 *l* 25·52	*l* 24·52 *l* 24·14	*l* 24·86 *l* 24·06	*l* 25·16 *l* 24·44	*l* 24·30 *l* 23·54	*l* 25·10 *l* 25·78	*l* 26·30 *l* 25·54	$M = 24''.84$ $w = 17.50$ $\frac{1}{w} = 0.06$ $C = 50° 44' 24''.84$
	25·59	24·93	23·74	25·29	24·33	24·46	24·80	23·92	25·44	25·92	

At IX (Dandoba Dongar)

December 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on VII (Palsi) 0° 0′	180° 0′	48° 13′	228° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
VII (Palsi) and X (Daphlápur)	″ *l* 7·42 *l* 7·08	″ *l* 8·02 *h* 6·72 *d* 5·74	″ *l* 8·48 *l* 9·76	″ *l* 8·84 *l* 8·12	″ *h* 6·46 *h* 7·16 *d* 6·12 *d* 5·72	″ *l* 8·04 *h* 8·94 *d* 7·47	″ *l* 6·04 *h* 6·30 *d* 7·01	″ *h* 6·88 *h* 7·60 *d* 6·81 *d* 7·01	″ *l* 5·94 *l* 6·06	″ *l* 5·94 *l* 6·80	$M = 7''.21$ $w = 8.39$ $\frac{1}{w} = 0.12$ $C = 56° 42' 7''.20$
	7·25	6·83	9·12	8·48	6·37	8·15	6·45	7·08	6·00	6·37	
X (Daphlápur) and XI (Athni)	*l* 20·48 *l* 20·54	*l* 20·38 *l* 20·48 *d* 18·80	*l* 15·90 *l* 15·58	*l* 19·32 *l* 18·64	*l* 19·88 *l* 19·28 *d* 18·89 *d* 18·49	*l* 19·36 *l* 19·84 *d* 18·58	*l* 19·48 *h* 20·90 *d* 21·03	*h* 17·82 *h* 17·06 *d* 17·01 *d* 17·21	*l* 20·20 *l* 20·12	*l* 20·38 *l* 20·28	$M = 19''.18$ $w = 4.00$ $\frac{1}{w} = 0.25$ $C = 46° 55' 19''.18$
	20·51	19·89	15·74	18·98	19·14	19·26	20·47	17·28	20·16	20·33	
XI (Athni) and XIII (Mávinhúnda)	*l* 44·42 *l* 44·72	*l* 44·94 *l* 45·02 *d* 43·35	*l* 48·26 *l* 48·26	*l* 45·70 *l* 46·76	*l* 46·44 *l* 46·56 *d* 45·81 *d* 45·41	*l* 48·82 *l* 47·68 *d* 47·23	*h* 46·00 *h* 45·46 *d* 46·57	*h* 48·02 *h* 49·32 *d* 48·24 *d* 48·44	*l* 47·10 *l* 47·00	*l* 44·30 *l* 44·08	$M = 46''.32$ $w = 3.75$ $\frac{1}{w} = 0.27$ $C = 54° 2' 46''.32$
	44·57	44·44	48·26	46·23	46·06	47·91	46·01	48·51	47·05	44·19	

* The only measures taken of these two angles in March 1865 were those under zero 182° 26′, the rest of the measures were completed in November 1865.

At IX (Dandoba Dongar)—(*Continued*).

Angle between	Circle readings, telescope being set on VII (Palsi) 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XIII (Mávinhúnda) and XIV (Hatarvat)	″ *l* 4·32 *l* 4·16	″ *l* 1·96 *l* 2·24 *d* 0·47	″ *l* 2·62 *l* 1·46	″ *l* 3·66 *l* 3·10	″ *l* 2·72 *l* 2·26 *d* 1·80 *d* 1·40	″ *l* 1·28 *l* 1·48 *d* 0·36	″ *h* 4·72 *h* 4·46 *d* 5·43	″ *h* 3·50 *h* 2·46 *d* 2·55 *d* 2·75	″ *l* 3·40 *l* 3·06	″ *l* 4·80 *l* 5·18	M = 3″·02 w = 5 ·07 $\frac{1}{w}$ = 0 ·20
	4·24	1·56	2·04	3·38	2·05	1·04	4·87	2·82	3·23	4·99	C = 28° 54′ 3″·01
XIV (Hatarvat) and XII (Majala)	*l* 44·78 *l* 43·26	*l* 45·06 *l* 46·14 *d* 43·97	*l* 44·50 *l* 43·96	*l* 45·40 *l* 45·62	*l* 46·68 *l* 45·86 *d* 45·58 *d* 45·18	*l* 46·50 *l* 45·46 *d* 44·96	*l* 44·40 *h* 44·20 *d* 45·14	*h* 45·62 *h* 45·40 *d* 45·08 *d* 45·28	*l* 43·32 *l* 43·82	*l* 44·40 *l* 43·34	M = 44″·77 w = 12 ·70 $\frac{1}{w}$ = 0 ·08
	44·02	45·06	44·23	45·51	45·83	45·64	44·58	45·35	43·57	43·87	C = 40° 41′ 44″·79
XII (Majala) and VIII (Kundal)	*l* 17·22 *l* 17·62	*l* 17·20 *l* 17·06 *d* 15·50	*l* 19·18 *l* 20·10	*l* 17·12 *l* 16·20	*h* 18·38 *h* 17·14 *d* 17·07 *d* 16·67	*l* 15·90 *l* 17·14 *d* 15·50	*l* 17·74 *h* 16·26 *d* 17·84	*h* 15·06 *h* 15·44 *d* 14·82 *d* 15·02	*l* 18·30 *l* 18·58	*l* 16·04 *l* 16·66	M = 17″·10 w = 5 ·82 $\frac{1}{w}$ = 0 ·17
	17·42	16·59	19·64	16·66	17·32	16·18	17·28	15·09	18·44	16·35	C = 57° 27′ 17″·09

At X (Daphlápur)

November 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XI (Athni) 237° 24′	57° 24′	280° 37′	100° 37′	323° 48′	143° 48′	7° 1′	187° 1′	50° 12′	230° 12′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XI (Athni) and IX (Dandoba Dongar)	″ *h* 42·86 *h* 41·72	″ *h* 43·86 *h* 44·30	″ *h* 43·72 *l* 43·52	″ *h* 41·24 *h* 41·64	″ *l* 43·40 *l* 44·24	″ *l* 45·26 *l* 43·46	″ *l* 43·04 *l* 44·96	″ *l* 43·52 *l* 42·48	″ *l* 41·74 *l* 42·58	″ *l* 43·12 *l* 42·54	M = 43″·16 w = 9 ·10 $\frac{1}{w}$ = 0 ·11
	42·29	44·08	43·62	41·44	43·82	44·36	44·00	43·00	42·16	42·83	C = 71° 52′ 43″·16
IX (Dandoba Dongar) and VII (Palsi)	*l* 6·46 *l* 6·88	*h* 6·64 *h* 6·68	*h* 5·56 *l* 6·06	*h* 6·46 *h* 6·66	*l* 5·88 *l* 5·38	*l* 4·58 *l* 6·06	*l* 9·48 *l* 8·00	*l* 7·80 *l* 7·00	*l* 8·30 *l* 7·82	*l* 6·88 *l* 6·80	M = 6″·77 w = 8 ·10 $\frac{1}{w}$ = 0 ·12
	6·67	6·66	5·81	6·56	5·63	5·32	8·74	7·40	8·06	6·84	C = 50° 43′ 6″·77

At XI (Athni)

December 1865; *observed by Captain C. T. Haig, R.E., with Barrow's 24-inch Theodolite No. 2.*

Angle between	Circle readings, telescope being set on XIII (Mávinhúnda) 0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XIII (Mávinhúnda) and IX (Dandoba Dongar)	″ h 51·08 l 51·36	″ l 50·66 l 51·70	″ l 50·10 l 50·34	″ l 49·70 l 50·26	″ l 50·78 l 52·42	″ l 49·92 l 49·52	″ l 51·04 l 50·92	″ l 49·62 l 50·44	″ l 50·66 l 50·32	″ l 50·80 l 50·46	$M = 50''\cdot61$ $w = 21\cdot70$
	51·22	51·18	50·22	49·98	51·60	49·72	50·98	50·03	50·49	50·63	$\frac{1}{w} = 0\cdot05$ $C = 75^\circ\ 9'\ 50''\cdot61$
IX (Dandoba Dongar) and X (Daphlápur)	h 57·28 h 58·34	l 61·64 l 61·40	l 59·12 l 60·14	l 60·12 l 60·08	l 59·70 l 58·94	l 59·28 l 59·50	l 58·72 l 59·18	l 59·46 l 59·78	l 60·78 l 59·72	l 60·66 l 60·86	$M = 59''\cdot74$ $w = 9\cdot20$
	57·81	61·52	59·63	60·10	59·32	59·39	58·95	59·62	60·25	60·76	$\frac{1}{w} = 0\cdot11$ $C = 61^\circ 11' 59''\cdot74$

At XII (Majala)

December 1865; *observed by Captain C. T. Haig, R.E., with Barrow's 24-inch Theodolite No. 2.*

Angle between	Circle readings, telescope being set on VIII (Kundal) 0° 0′	180° 0′	43° 12′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
VIII (Kundal) and IX (Dandoba Dongar)	″ h 20·50 h 21·06	″ l 19·92 l 19·68	″ l 20·54 l 19·56	″ l 19·46 l 20·66	″ l 21·30 l 21·98	″ l 22·04 l 22·56	″ h 19·48 h 19·84	″ h 21·38 h 20·62	″ h 21·98 h 20·80	″ h 22·20 h 22·56	$M = 20''\cdot91$ $w = 9\cdot20$
	20·78	19·80	20·05	20·06	21·64	22·30	19·66	21·00	21·39	22·38	$\frac{1}{w} = 0\cdot11$ $C = 71^\circ 48' 20''\cdot91$
IX (Dandoba Dongar) and XIII (Mávinhúnda)	h 45·14 h 44·40	l 45·28 l 45·16	l 45·62 l 44·80	l 44·24 l 43·82	l 44·14 l 43·62	l 40·04 l 39·92	h 44·94 h 44·14	h 43·90 h 44·26	h 45·18 h 44·80	h 45·38 h 44·90	$M = 44''\cdot18$ $w = 4\cdot00$
	44·77	45·22	45·21	44·03	43·88	39·98	44·54	44·08	44·99	45·14	$\frac{1}{w} = 0\cdot25$ $C = 73^\circ 21' 44''\cdot18$
XIII (Mávinhúnda) and XIV (Hatarvat)	h 19·12 h 18·88	l 17·58 l 17·42	l 17·48 l 18·10	l 17·76 l 17·44	l 15·82 l 16·40	l 20·78 l 19·78	h 17·88 h 18·86	h 18·04 h 18·68	h 15·46 h 16·82	h 18·50 h 18·20	$M = 17''\cdot95$ $w = 6\cdot10$
	19·00	17·50	17·79	17·60	16·11	20·28	18·37	18·36	16·14	18·35	$\frac{1}{w} = 0\cdot16$ $C = 37^\circ 24' 17''\cdot95$

At XIII (Mávinhúnda)

December 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XVI (Manikeri) 88° 38′	268° 38′	131° 51′	311° 51′	175° 2′	355° 2′	218° 15′	38° 15′	261° 26′	81° 26′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVI (Manikeri) and XV (Karabgati)	″ h 38·48 h 37·62 38·05	″ h 38·50 h 37·82 38·16	″ h 35·94 h 35·50 35·72	″ h 35·20 h 33·92 34·56	″ h 35·32 l 36·46 35·89	″ l 35·70 l 36·20 35·95	″ l 34·74 l 35·54 35·14	″ l 33·90 l 33·74 33·82	″ l 36·70 l 36·68 36·69	″ l 34·78 l 34·32 34·55	$M = 35''\cdot85$ $w = 4\cdot60$ $\frac{1}{w} = 0\cdot22$ $C = 45^\circ\ 4'\ 35''\cdot85$
XV (Karabgati) and XIV (Hatarvat)	h 23·16 h 23·30 23·23	h 24·06 h 24·42 24·24	h 22·86 h 22·16 22·51	h 21·68 h 21·90 21·79	h 22·90 l 22·06 22·48	l 23·58 l 23·02 23·30	l 23·84 l 22·44 23·14	l 23·80 l 23·96 23·88	l 23·70 l 23·76 23·73	l 23·54 l 25·36 24·45	$M = 23''\cdot28$ $w = 12\cdot70$ $\frac{1}{w} = 0\cdot08$ $C = 78^\circ\ 5'\ 23''\cdot28$
XIV (Hatarvat) and XII (Majala)	h 48·56 h 48·10 48·33	h 47·14 h 47·80 47·47	h 47·72 h 48·70 48·21	h 48·80 h 49·10 48·95	h 48·08 l 47·26 47·67	l 46·12 l 47·02 46·57	l 47·80 l 49·20 48·50	l 47·62 l 47·72 47·67	l 45·54 l 46·06 45·80	l 48·44 l 47·08 47·76	$M = 47''\cdot69$ $w = 10\cdot30$ $\frac{1}{w} = 0\cdot10$ $C = 60^\circ\ 21'\ 47''\cdot69$
XII (Majala) and IX (Dandoba Dongar)	h 29·32 h 29·52 29·42	h 31·62 h 30·84 31·23	h 31·04 h 31·02 31·03	h 33·08 h 32·38 32·73	h 31·90 l 32·38 32·14	l 33·08 l 31·94 32·51	l 30·84 l 30·34 30·59	l 31·46 l 31·26 31·36	l 31·96 l 31·00 31·48	l 30·12 h 29·12 29·62	$M = 31''\cdot21$ $w = 7\cdot70$ $\frac{1}{w} = 0\cdot13$ $C = 37^\circ\ 2'\ 31''\cdot21$
IX (Dandoba Dongar) and XI (Athni)	h 29·68 h 28·54 29·11	h 29·62 h 30·52 30·07	h 29·28 h 28·62 28·95	h 27·32 h 28·36 27·84	h 27·44 l 27·42 27·43	l 26·80 l 28·16 27·48	l 29·70 l 28·64 29·17	l 28·60 l 28·34 28·47	l 28·94 l 29·74 29·34	l 28·54 h 29·38 28·96	$M = 28''\cdot68$ $w = 11\cdot80$ $\frac{1}{w} = 0\cdot08$ $C = 50^\circ\ 47'\ 28''\cdot68$

At XIV (Hatarvat)

December 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XII (Majala) 166° 1′	346° 1′	209° 13′	29° 13′	252° 24′	72° 24′	295° 37′	115° 37′	338° 48′	158° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XII (Majala) and IX (Dandoba Dongar)	″ h 15·20 h 15·32 15·26	″ h 17·36 h 16·60 16·98	″ l 16·82 l 16·32 16·57	″ l 16·28 l 15·70 15·99	″ l 15·46 l 15·44 15·45	″ l 17·74 l 17·04 17·39	″ h 15·88 h 16·70 16·29	″ h 16·18 h 15·66 15·92	″ h 15·94 h 15·98 15·96	″ h 15·52 h 14·80 15·16	$M = 16''\cdot10$ $w = 17\cdot50$ $\frac{1}{w} = 0\cdot06$ $C = 28^\circ\ 32'\ 16''\cdot10$

At XIV (Hatarvat)—(*Continued*).

Angle between	Circle readings, telescope being set on XII (Majala) 166° 1′	346° 1′	209° 13′	29° 13′	252° 24′	72° 24′	295° 37′	115° 37′	338° 48′	158° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
IX (Dandoba Dongar) and XIII (Mávinhúnda)	″ h 43·48 h 44·02	″ h 43·50 h 44·38	″ l 42·18 l 42·94	″ l 43·26 l 42·98	″ l 43·16 l 42·40	″ l 42·18 l 42·46	″ h 43·66 h 42·76	″ h 42·56 h 43·40	″ h 43·56 h 43·04	″ h 42·14 h 43·64	$M = 43''\cdot09$ $w = 29\cdot40$ $\frac{1}{w} = 0\cdot03$
	43·75	43·94	42·56	43·12	42·78	42·32	43·21	42·98	43·30	42·89	$C = 53°\,41'\,43''\cdot09$
XIII (Mávinhúnda) and XV (Karabgati)	h 2·62 h 3·02	h 3·68 h 2·90	l 4·02 l 3·26	l 3·72 l 4·30	l 4·20 l 5·50	l 3·46 l 3·84	h 3·04 h 2·88	h 4·46 h 4·04	h 5·46 h 5·00	h 6·00 h 5·28	$M = 4''\cdot03$ $w = 10\cdot30$ $\frac{1}{w} = 0\cdot10$
	2·82	3·29	3·64	4·01	4·85	3·65	2·96	4·25	5·23	5·64	$C = 49°\,36'\,4''\cdot03$
XV (Karabgati) and XVII (Karigudd)	h 30·60 h 30·72	h 29·80 h 30·14	l 29·32 l 30·10	l 28·62 l 28·18	l 30·40 l 28·78	l 28·34 l 27·40	h 30·84 h 31·02	h 29·94 h 30·10	h 30·10 h 30·28	h 29·76 h 29·70	$M = 29''\cdot71$ $w = 10\cdot80$ $\frac{1}{w} = 0\cdot09$
	30·66	29·97	29·71	28·40	29·59	27·87	30·93	30·02	30·19	29·73	$C = 62°\,9'\,29''\cdot71$

At XV (Karabgati)

December 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24*-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on R. M. 0° 0′	180° 0′	43° 12′	223° 12′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
R. M. and XIII (Mávinhúnda)	″ l 48·40 l 48·74	″ l 47·86 l 47·80	″ l 49·12 l 47·86	″ h 48·98 h 48·48	″ h 47·52 h 47·54	″ h 47·10 h 47·74	″ h 45·98 h 46·82 h 46·66	″ h 47·10 h 47·46	″ h 48·16 h 47·88	″ h 46·98 h 46·64	$M = 47''\cdot72$ $w = 16\cdot16$ $\frac{1}{w} = 0\cdot06$
	48·57	47·83	48·49	48·73	47·53	47·42	46·49	47·28	48·02	46·81	$C = 30°\,18'\,47''\cdot72$
XIII (Mávinhúnda) and XVI (Manikeri)	l 33·60 l 33·82	l 32·78 l 33·52	l 34·32 l 34·72	h 32·26 h 33·60	h 34·96 h 34·18	h 35·42 h 36·08	h 34·00 h 34·84	h 34·72 h 34·28	h 33·52 h 32·94	h 35·22 h 34·42	$M = 34''\cdot16$ $w = 11\cdot80$ $\frac{1}{w} = 0\cdot08$
	33·71	33·15	34·52	32·93	34·57	35·75	34·42	34·50	33·23	34·82	$C = 85°\,36'\,34''\cdot16$
XVI (Manikeri) and XVIII (Kathárigad)	l 42·62 l 42·12	l 41·88 l 41·38	l 41·04 l 40·88	h 42·88 h 41·70	h 39·90 h 40·98	h 41·26 h 41·88	h 41·26 h 41·06	h 40·44 h 40·10	h 42·12 h 41·78	h 40·02 h 40·86	$M = 41''\cdot31$ $w = 15\cdot20$ $\frac{1}{w} = 0\cdot07$
	42·37	41·63	40·96	42·29	40·44	41·57	41·16	40·27	41·95	40·44	$C = 57°\,7'\,41''\cdot31$

NOTE.—R. M. denotes Referring Mark.

At XV (Karabgati)—(*Continued*).

Angle between	Circle readings, telescope being set on R. M. 0° 0′	180° 0′	43° 12′	223° 12′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVIII (Kathárigad) and XIX (Kolanhatti)	″ l 10.80 l 11.74	″ l 13.40 l 13.22	″ l 11.96 l 11.24	″ h 12.86 h 13.30	″ h 12.74 h 12.16	″ h 12.82 h 11.64	″ h 12.90 h 13.10	″ h 12.94 h 13.14	″ h 12.58 h 13.58	″ h 12.66 h 13.42	$M = 12''.61$ $w = 17.90$ $\frac{1}{w} = 0.06$
	11.27	13.31	11.60	13.08	12.45	12.23	13.00	13.04	13.08	13.04	$C = 58° 13' 12''.61$
XIX (Kolanhatti) and XVII (Karigudd)	l 10.32 l 10.28	l 9.84 l 9.80	l 9.94 l 11.42	h 9.20 h 8.98	h 9.96 h 10.22	h 9.70 h 9.74	h 11.12 h 9.44	h 10.62 h 11.90	h 10.06 h 9.20	h 10.52 h 9.80	$M = 10''.10$ $w = 21.30$ $\frac{1}{w} = 0.05$
	10.30	9.82	10.68	9.09	10.09	9.72	10.28	11.26	9.63	10.16	$C = 66° 9' 10''.10$
XVII (Karigudd) and XIV (Hatarvat)	l 45.00 l 44.64	l 44.86 l 45.48	l 46.04 l 44.74	h 45.70 h 45.72 h 45.96	h 46.96 h 47.26	h 44.78 h 45.24	h 45.58 h 46.30	h 46.30 h 46.50	h 45.54 h 45.76	h 44.52 h 43.98	$M = 45''.55$ $w = 13.94$ $\frac{1}{w} = 0.07$
	44.82	45.17	45.39	45.79	47.11	45.01	45.94	46.40	45.65	44.25	$C = 40° 34' 45''.55$

At XVI (Manikeri)

December 1865; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XVIII (Kathárigad) 0° 0′	180° 0′	43° 12′	223° 12′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVIII (Kathárigad) and XV (Karabgati)	″ h 56.96 h 56.72	″ h 54.34 h 55.00	″ h 56.54 h 55.38	″ h 57.34 h 55.96	″ h 54.44 h 54.92	″ h 57.56 h 56.86	″ h 57.76 h 56.92	″ h 57.48 h 58.18	″ h 55.84 l 57.14	″ l 55.70 l 56.60	$M = 56''.38$ $w = 8.10$ $\frac{1}{w} = 0.12$
	56.84	54.67	55.96	56.65	54.68	57.21	57.34	57.83	56.49	56.15	$C = 64° 4' 56''.38$
XV (Karabgati) and XIII (Mávinhúnda)	h 52.14 h 50.78	h 53.56 h 53.34	h 49.42 h 51.10	h 51.34 h 52.28	h 53.64 h 52.34	h 51.24 h 50.84	h 51.36 h 50.64	h 51.24 h 49.72	l 51.78 l 50.66	l 52.44 l 51.18	$M = 51''.55$ $w = 8.30$ $\frac{1}{w} = 0.12$
	51.46	53.45	50.26	51.81	52.99	51.04	51.00	50.48	51.22	51.81	$C = 49° 18' 51''.55$

NOTE.—R. M. denotes Referring Mark.

At XVII (Karigudd)

January 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XIV (Hatarvat) 0° 0′	180° 0′	43° 12′	223° 12′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XIV (Hatarvat) and XV Karabgati	″	″	″	″	″	″	″	″	″	″	$M = 46''·02$
	h 48·18	h 46·02	h 45·48	h 45·30	h 46·36	h 44·28	l 45·52	l 45·48	l 45·06	l 45·64	$w = 12·20$
	h 47·62	h 46·64	h 45·92	h 47·16	h 45·94	l 45·20	l 46·10	l 47·08	l 45·26	l 46·16	$\frac{1}{w} = 0·08$
	47·90	46·33	45·70	46·23	46·15	44·74	45·81	46·28	45·16	45·90	$C = 77° 15' 46''·02$
XV (Karabgati) and XIX (Kolanhatti)	h 36·88	h 36·86	h 39·02	h 37·98	h 35·88	h 39·68	l 37·04	l 37·04	l 37·60	l 38·70	$M = 37''·73$
	h 37·52	h 36·18	h 38·66	h 38·20	h 37·12	l 39·16	l 36·90	l 37·06	l 38·40	l 38·76	$w = 9·00$
											$\frac{1}{w} = 0·11$
	37·20	36·52	38·84	38·09	36·50	39·42	36·97	37·05	38·00	38·73	$C = 40° 46' 37''·73$

At XVIII (Kathárigad)

January 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXI (Hirĕkummígudd) 107° 29′	287° 29′	150° 42′	330° 42′	193° 53′	13° 53′	237° 5′	57° 5′	280° 17′	100° 17′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXI (Hirĕkummígudd) and XX (Chikk Nandihallígudd)	″	″	″	″	″	″	″	″	″	″	$M = 21''·30$
	h 23·54	h 21·48	l 18·50	l 21·12	l 21·32	l 22·78	h 21·38	h 23·10	h 21·16	h 20·64	$w = 6·80$
	h 23·24	l 21·20	l 19·14	l 20·46	l 21·62	h 22·80	h 20·42	h 22·60	h 20·70	h 20·16	$\frac{1}{w} = 0·15$
	h 22·56	l 20·78	l 20·14	l 20·58	l 22·00	h 22·28	h 19·92	h 21·86	h 21·18	h 20·30	
	23·11	21·15	19·26	20·72	21·65	22·62	20·57	22·52	21·01	20·37	$C = 82° 27' 21''·30$
XX (Chikk Nandihallígudd) and XIX (Kolanhatti)	h 59·58	h 60·74	l 59·96	l 60·34	l 61·30	l 59·96	h 61·70	h 61·42	h 60·62	h 60·78	$M = 61''·00$
	h 59·62	l 62·42	l 61·20	l 61·64	l 61·62	l 59·54	h 62·30	h 61·54	h 61·02	h 62·04	$w = 12·10$
	h 59·10	l 62·02	l 60·06	l 60·54	l 60·34	h 60·76	h 62·84	h 61·52	h 61·26	h 62·04	$\frac{1}{w} = 0·08$
	59·43	61·73	60·41	60·84	61·09	60·09	62·28	61·49	60·97	61·62	$C = 61° 4' 1''·00$
XIX (Kolanhatti) and XV (Karabgati)	h 9·68	l 10·38	l 12·88	l 11·48	l 12·04	h 10·76	h 10·78	h 10·34	h 11·12	h 9·04	$M = 10''·83$
	h 11·28	l 10·86	l 12·54	l 11·44	l 11·58	h 9·90	h 10·10	h 11·56	h 10·50	h 8·40	$w = 8·40$
											$\frac{1}{w} = 0·12$
	10·48	10·62	12·71	11·46	11·81	10·33	10·44	10·95	10·81	8·72	$C = 50° 12' 10''·83$
XV (Karabgati) and XVI (Manikeri)	h 25·00	l 24·20	l 24·00	l 24·12	l 22·74	h 22·52	h 22·70	h 23·24	h 24·90	h 26·12	$M = 23''·92$
	h 23·98	l 24·00	l 23·26	l 24·30	l 23·10	h 23·06	h 22·30	h 23·52	h 25·26	h 26·00	$w = 7·90$
											$\frac{1}{w} = 0·13$
	24·49	24·10	23·63	24·21	22·92	22·79	22·50	23·38	25·08	26·06	$C = 58° 47' 23''·92$

At XIX (Kolanhatti)

January 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	76° 53′	256° 53′	120° 5′	300° 5′	163° 16′	343° 16′	206° 29′	26° 29′	249° 40′	69° 40′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	Circle readings, telescope being set on XVII (Karigudd)										
	″	″	″	″	″	″	″	″	″	″	
XVII (Karigudd) and XV (Karabgati)	*h* 15·50 *h* 15·66	*h* 14·22 *l* 14·78	*l* 15·08 *l* 15·32	*l* 15·16 *l* 14·38	*h* 15·10 *h* 15·92	*h* 13·74 *h* 13·66	*h* 13·62 *h* 14·08 *l* 13·04	*h* 16·24 *h* 15·54	*l* 12·74 *l* 13·12	*l* 13·86 *l* 14·08	$M = 14''\cdot56$ $w = 9\cdot62$ $\frac{1}{w} = 0\cdot10$ $C = 73^\circ\ 4'\ 14''\cdot56$
	15·58	14·50	15·20	14·77	15·51	13·70	13·58	15·89	12·93	13·97	
XV (Karabgati) and XVIII (Kathárigad)	*h* 37·38 *h* 38·22	*h* 38·50 *l* 38·46	*l* 36·34 *l* 36·34	*l* 37·90 *l* 37·00	*h* 38·16 *h* 38·20	*h* 39·98 *h* 39·44	*h* 39·84 *h* 37·80 *l* 40·34 *l* 39·18	*h* 38·02 *h* 38·48	*l* 39·26 *l* 37·50	*l* 37·68 *l* 38·14	$M = 38''\cdot18$ $w = 9\cdot87$ $\frac{1}{w} = 0\cdot10$ $C = 71^\circ\ 34'\ 38''\cdot19$
	37·80	38·48	36·34	37·45	38·18	39·71	39·29	38·25	38·38	37·91	
XVIII (Kathárigad) and XX (Chikk Nandihallígudd)	*h* 11·54 *h* 10·24 *h* 11·54	*h* 9·80 *l* 9·86 *l* 9·70	*l* 9·14 *l* 10·06 *l* 8·58	*l* 8·60 *l* 9·72 *l* 8·70	*h* 11·10 *h* 10·24 *h* 10·26	*h* 9·64 *h* 10·72 *h* 10·38	*h* 10·16 *l* 8·96 *l* 10·44	*h* 10·20 *h* 10·60 *h* 9·26	*l* 9·68 *l* 11·32 *l* 10·34	*l* 10·54 *l* 11·00 *l* 9·86	$M = 10''\cdot07$ $w = 20\cdot40$ $\frac{1}{w} = 0\cdot05$ $C = 68^\circ\ 55'\ 10''\cdot07$
	11·11	9·79	9·26	9·01	10·53	10·25	9·85	10·02	10·45	10·47	
XX (Chikk Nandihallígudd) and XXII (Yalúr)	*h* 31·26 *h* 31·64 *h* 31·42	*h* 31·94 *l* 31·72 *l* 32·40	*l* 33·90 *l* 32·66 *l* 32·44	*l* 33·50 *l* 34·34 *l* 32·78	*h* 30·98 *h* 31·00 *h* 31·24	*h* 32·46 *h* 31·28 *h* 31·24	*h* 33·20 *l* 31·98 *l* 31·82	*h* 31·80 *h* 31·20 *h* 32·56	*l* 31·36 *h* 31·64 *h* 30·84	*h* 32·06 *h* 32·74 *h* 32·22	$M = 32''\cdot05$ $w = 14\cdot90$ $\frac{1}{w} = 0\cdot07$ $C = 69^\circ\ 33'\ 32''\cdot05$
	31·44	32·02	33·00	33·54	31·07	31·66	32·33	31·85	31·28	32·34	

At XX (Chikk Nandihallígudd)

January 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	0° 0′	180° 0′	43° 12′	223° 12′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	Circle readings, telescope being set on XXV (Kalkera)										
	″	″	″	″	″	″	″	″	″	″	
XXV (Kalkera) and XXIII (Shamshergad)	*h* 34·96 *h* 35·32 *l* 34·50	*h* 33·80 *l* 33·68 *l* 33·34 *d* 33·90	*l* 33·80 *l* 35·12 *h* 35·08	*l* 36·58 *l* 35·60 *l* 35·90	*h* 34·26 *h* 32·98 *h* 33·50	*h* 33·58 *h* 34·96 *h* 35·20 *d* 35·88 *d* 34·86 *d* 34·54 *d* 34·95	*l* 34·50 *l* 35·58 *l* 35·14	*h* 35·34 *l* 36·76 *l* 36·44	*l* 33·44 *l* 33·06 *l* 33·24	*l* 34·06 *l* 33·40 *h* 34·74	$M = 34''\cdot63$ $w = 9\cdot36$ $\frac{1}{w} = 0\cdot11$ $C = 90^\circ\ 35'\ 34''\cdot63$
	34·93	33·68	34·67	36·03	33·58	34·85	35·07	36·18	33·25	34·07	

At XX (Chikk Nandihallígudd)—(*Continued*).

Angle between	Circle readings, telescope being set on XXV (Kalkera) 0° 0′	180° 0′	43° 12′	223° 12′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXIII (Shamshergad) and XXII (Yalúr)	*h* 47·50 *h* 47·50 *l* 47·98	*h* 49·48 *l* 50·00 *l* 49·40 *d* 49·92	*l* 49·28 *l* 48·24 *h* 48·72	*l* 45·96 *l* 47·52 *l* 47·28	*h* 49·00 *h* 49·64 *h* 48·86	*h* 47·02 *h* 48·04 *h* 48·36 *d* 49·32 *d* 47·94 *d* 47·70 *d* 48·17	*l* 46·58 *l* 46·22 *l* 47·16	*h* 47·84 *l* 46·54 *l* 46·88	*l* 48·16 *l* 48·32 *l* 47·04	*l* 47·08 *l* 48·62 *h* 48·34	$M = 47''\cdot99$ $w = 9\cdot37$ $\frac{1}{w} = 0\cdot11$ $C = 37°\ 35'\ 47''\cdot99$
	47·66	49·70	48·75	46·92	49·17	48·08	46·65	47·09	47·84	48·01	
XXII (Yalúr) and XIX (Kolanhatti)	*h* 44·32 *h* 43·36 *l* 44·86	*h* 43·34 *l* 44·46 *l* 43·88 *d* 44·18	*l* 44·02 *l* 43·92 *h* 42·34	*l* 45·34 *l* 44·26 *l* 44·60	*h* 42·18 *h* 42·10 *h* 43·94	*h* 43·36 *h* 43·76 *h* 43·62 *d* 43·69	*l* 44·50 *l* 45·20 *l* 44·76	*h* 42·58 *l* 43·82 *l* 43·74	*l* 46·58 *l* 47·08 *l* 46·78	*l* 46·02 *l* 45·50 *h* 44·42	$M = 44''\cdot30$ $w = 6\cdot82$ $\frac{1}{w} = 0\cdot15$ $C = 46°\ 52'\ 44''\cdot30$
	44·18	43·97	43·43	44·73	42·74	43·61	44·82	43·38	46·81	45·31	
XIX (Kolanhatti) and XVIII (Kathárigad)	*h* 50·88 *h* 51·66 *l* 50·04	*h* 50·82 *l* 50·22 *l* 50·22 *d* 50·71	*l* 49·98 *l* 51·04 *h* 51·08	*l* 50·52 *l* 49·94 *l* 50·34	*h* 52·28 *h* 51·66 *h* 50·98	*h* 53·04 *h* 52·54 *h* 52·12 *d* 52·68	*l* 51·88 *l* 50·68 *l* 51·28	*h* 51·78 *l* 50·40 *l* 51·84	*l* 49·36 *l* 49·74 *l* 50·16	*l* 48·98 *l* 48·34 *h* 49·62	$M = 50''\cdot79$ $w = 9\cdot04$ $\frac{1}{w} = 0\cdot11$ $C = 50°\ 0'\ 50''\cdot79$
	50·86	50·49	50·70	50·27	51·64	52·60	51·28	51·34	49·75	48·98	
XVIII (Kathárigad) and XXI (Hirĕkummígudd)	*h* 45·56 *h* 45·60 *l* 46·44	*l* 46·64 *l* 47·24 *l* 48·12 *d* 47·62	*l* 46·14 *l* 46·38 *l* 48·56 *h* 47·30	*l* 46·30 *l* 46·38 *l* 47·14	*h* 46·82 *h* 48·30 *h* 47·58	*h* 46·90 *h* 45·78 *h* 45·12 *d* 46·04	*l* 45·94 *l* 46·66 *l* 46·28	*h* 47·18 *l* 46·68 *l* 45·78	*l* 46·24 *l* 46·38 *l* 45·88	*l* 48·24 *h* 47·22 *h* 46·36 *d* 49·33 *d* 48·93	$M = 46''\cdot76$ $w = 14\cdot85$ $\frac{1}{w} = 0\cdot07$ $C = 44°\ 52'\ 46''\cdot77$
	45·87	47·41	47·10	46·61	47·57	45·96	46·29	46·55	46·17	48·02	
XXI (Hirĕkummígudd) and XXIV (Navalúr)	*h* 54·74 *h* 54·86 *l* 53·80	*l* 52·66 *l* 52·66 *l* 53·18 *d* 53·12	*l* 52·84 *l* 52·72 *l* 50·58 *h* 53·34	*l* 53·20 *l* 53·28 *l* 52·20	*h* 54·02 *h* 53·86 *h* 53·20	*h* 52·94 *h* 53·12 *h* 54·42 *d* 53·60	*l* 54·48 *l* 53·82 *l* 53·80	*h* 52·72 *l* 52·46 *l* 53·50	*l* 53·38 *l* 53·56 *l* 54·32	*l* 52·10 *h* 50·38 *h* 52·12 *d* 53·59 *d* 53·19	$M = 53''\cdot28$ $w = 15\cdot35$ $\frac{1}{w} = 0\cdot07$ $C = 56°\ 26'\ 53''\cdot26$
	54·47	52·91	52·37	52·89	53·69	53·52	54·03	52·89	53·75	52·28	

At XXI (Hirĕkummígudd)

January 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXIV (Navalúr)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0′	180° 0′	43° 13′	223° 12′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	
XXIV (Navalúr) and XX (Chikk Nandihallígudd)	″ h 56·06 h 56·68 h 56·16	″ h 55·28 h 56·10 h 56·28	″ l 56·18 l 56·34 l 57·26	″ h 56·54 h 58·48 h 56·90	″ l 55·48 l 55·30 l 56·04	″ l 55·88 l 55·68 l 55·64	″ l 56·72 l 56·62 l 56·22	″ l 56·62 l 57·22 l 56·70	″ l 55·86 l 55·82 l 55·80	″ l 58·24 l 56·82 l 57·58	$M = 56''\cdot42$ $w = 19\cdot60$ $\frac{1}{w} = 0\cdot05$ $C = 49^\circ\ 43'\ 56''\cdot42$
	56·30	55·89	56·59	57·31	55·61	55·73	56·52	56·85	55·83	57·55	
XX (Chikk Nandihallígudd) and XVIII (Kathárigad)	h 55·24 h 54·26 h 54·12	h 55·90 h 55·14 h 55·04	l 54·94 l 53·14 l 53·38	h 54·66 h 54·56 h 54·68	l 56·02 l 54·54 l 55·34	l 54·42 l 55·28 l 54·02	l 53·64 l 53·96 l 53·34	l 52·86 l 52·66 l 52·74	l 55·18 l 54·36 l 53·50	l 53·60 l 53·66 l 53·72	$M = 54''\cdot26$ $w = 13\cdot70$ $\frac{1}{w} = 0\cdot07$ $C = 52^\circ\ 39'\ 54''\cdot26$
	54·54	55·36	53·82	54·63	55·30	54·57	53·65	52·75	54·35	53·66	

At XXII (Yalúr)

February 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XIX (Kolanhatti)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0′	180° 0′	43° 13′	223° 13′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	
XIX (Kolanhatti) and XX (Chikk Nandihallígudd)	″ h 46·14 h 46·42 h 46·54	″ h 47·80 h 47·66 h 46·72	″ h 43·78 h 44·74 h 44·60	″ l 45·50 l 44·10 h 44·38 h 45·40 h 44·92	″ h 44·12 h 44·86 h 44·10	″ h 45·64 h 46·52 h 46·92	″ h 45·62 h 46·10 h 45·94	″ h 45·52 h 45·82 h 46·14	″ h 46·06 h 45·68 h 45·94	″ h 46·32 h 46·34 h 46·64	$M = 45''\cdot78$ $w = 10\cdot02$ $\frac{1}{w} = 0\cdot10$ $C = 63^\circ\ 33'\ 45''\cdot78$
	46·37	47·39	44·37	44·86	44·36	46·36	45·89	45·83	45·89	46·43	
XX (Chikk Nandihallígudd) and XXIII (Samshergad)	h 35·24 h 35·62 h 35·86	h 35·12 h 35·26 h 35·64	l 34·48 l 34·16 l 34·74	l 34·44 l 35·76 l 34·54	h 37·68 h 37·78 h 37·28	h 38·38 h 37·26 h 36·68	h 35·34 h 34·96 h 34·36	h 36·40 h 35·54 h 35·08	h 34·92 h 34·40 h 35·14	h 35·22 h 35·62 h 34·74	$M = 35''\cdot59$ $w = 8\cdot20$ $\frac{1}{w} = 0\cdot12$ $C = 66^\circ\ 11'\ 35''\cdot59$
	35·57	35·34	34·46	34·91	37·58	37·44	34·89	35·67	34·82	35·19	

At XXIII (Samshergad)

January and February 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXII (Yalúr) 245° 21′	65° 21′	288° 34′	108° 34′	331° 45′	151° 45′	14° 58′	194° 58′	58° 9′	238° 9′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXII (Yalúr) and XX (Chikk Nandihallígudd)	h 35·84 h 34·64 h 35·42	h 37·76 h 38·18 h 37·52	h 38·30 l 37·38 l 37·86	h 36·86 h 36·90 h 37·06	l 37·48 l 38·02 l 37·96	l 37·92 l 37·50 l 37·64	h 37·86 h 38·24 h 38·20	l 36·86 l 36·12 l 37·34	h 38·18 h 38·76 h 39·66	h 36·44 h 38·20 h 37·54	M = 37″·46 w = 10 ·20 $\frac{1}{w}$ = 0 ·10 C = 76° 12′ 37″·46
	35·30	37·82	37·85	36·94	37·82	37·69	38·10	36·77	38·87	37·39	
XX (Chikk Nandihallígudd) and XXV (Kalkera)	h 12·94 h 12·94 h 12·28	h 12·78 h 12·36 h 12·56	l 11·94 l 12·72 l 13·18	h 12·10 h 12·02 h 11·50	l 13·82 l 12·58 l 11·96	l 12·76 l 12·90 l 13·08	h 11·86 h 11·58 h 11·96	l 13·54 l 12·68 l 12·80	h 12·48 h 10·88 h 11·22	h 12·00 h 10·34 h 11·90	M = 12″·32 w = 22 ·70 $\frac{1}{w}$ = 0 ·04 C = 38° 26′ 12″·32
	12·72	12·57	12·61	11·87	12·79	12·91	11·80	13·01	11·53	11·41	

At XXIV (Navalúr)

* *January* 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.
† *February* 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXVII (Kundgol) 0° 1′	180° 1′	79° 9′	259° 8′	158° 27′	338° 28′	237° 38′	57° 38′	316° 45′	136° 44′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
† XXVII (Kundgol) and XXVI (Ganigudd)	h 30·84 h 29·92 h 28·22	h 28·74 h 29·00 h 29·22	h 29·48 h 29·06 l 28·02	l 27·06 l 29·02 l 27·96	h 29·26 h 28·10 h 29·02	h 28·10 h 29·18 h 28·58	h 28·78 h 26·68 h 28·60 h 26·54	h 27·38 h 28·00 h 28·76	h 28·94 l 28·78 l 27·86	h 29·08 h 27·30 l 28·62	M = 28″·55 w = 20 ·17 $\frac{1}{w}$ = 0 ·05 C = 84° 1′ 28″·54
	29·66	28·99	28·85	28·01	28·79	28·62	27·65	28·05	28·53	28·33	
† XXVI (Ganigudd) and XXV (Kalkera)	h 33·58 h 32·02 h 33·86	h 32·96 h 32·52 h 33·96	h 30·70 h 32·72 h 34·84 h 35·20 h 33·02	l 34·62 l 36·66 l 34·42	h 31·38 h 33·52 h 33·22	h 35·86 h 34·72 h 32·68 h 35·92 h 32·72	h 30·64 h 34·06 h 31·44 h 33·24	h 34·06 h 33·18 h 34·50	h 34·88 l 33·60 l 33·68	h 33·16 h 33·82 l 31·32	M = 33″·50 w = 8 ·54 $\frac{1}{w}$ = 0 ·12 C = 47° 53′ 33″·50
	33·15	33·15	33·30	35·23	32·71	34·38	32·35	33·91	34·05	32·77	

Angle between	Circle readings, telescope being set on XXV (Kalkera) 238° 37′	58° 36′	281° 49′	101° 49′	325° 0′	145° 0′	8° 13′	188° 13′	51° 24′	231° 24′	
	″	″	″	″	″	″	″	″	″	″	
* XXV (Kalkera) and XX (Chikk Nandihallígudd)	h 18·88 h 18·46 h 18·02	h 18·12 h 18·62 h 18·50	h 18·52 h 19·12 h 19·62	h 17·92 h 18·56 h 17·72	l 20·28 l 19·90 l 20·24	l 18·36 l 18·48 l 18·58	l 18·32 l 18·16 l 19·52	l 19·24 l 18·54 l 16·94 l 18·20	l 17·78 l 16·94 l 18·34	l 21·94 l 22·08 l 22·38	M = 18″·94 w = 5 ·61 $\frac{1}{w}$ = 0 ·18 C = 47° 34′ 18″·94
	18·45	18·41	19·09	18·07	20·14	18·47	18·67	18·23	17·69	22·13	

At XXIV (Navalúr)—(*Continued*).

Angle between	Circle readings, telescope being set on XXV (Kalkera)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	238° 37′	58° 36′	281° 49′	101° 49′	325° 0′	145° 0′	8° 13′	188° 13′	51° 24′	231° 24′	
* XX (Chikk Nandihallígudd) and XXI (Hirĕkummígudd)	″ h 14·68 h 14·04 h 13·16	″ h 14·40 h 14·38 h 13·80	″ h 13·72 h 12·66 h 13·74	″ h 12·58 h 11·98 h 13·74	″ l 13·66 l 13·48 l 15·02	″ l 12·50 l 12·46 l 12·48	″ l 14·24 l 12·82 l 14·10	″ l 12·74 l 13·76 l 13·70	″ l 12·76 l 12·94 l 14·08	″ l 14·12 l 13·58 l 13·84	M = 13″·51 w = 25·00 1/w = 0·04 C = 73° 49′ 13″·51
	13·96	14·19	13·37	12·77	14·05	12·48	13·72	13·40	13·26	13·85	

At XXV (Kalkera)

‡ *January* 1866; *observed by Captain C. T. Haig, R.E., with Barrow's* 24-*inch Theodolite No.* 2.
§ *February* 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXIII (Samshergad)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0′	180° 0′	43° 13′	223° 12′	86° 24′	266° 24′	129° 36′	309° 36′	172° 48′	352° 48′	
‡ XXIII (Samshergad) and XX (Chikk Nandihallígudd)	″ h 16·64 h 16·58 h 16·32	″ h 14·88 h 15·14 h 14·64	″ h 15·58 h 16·14 h 15·02	″ h 14·72 h 15·00 h 14·92	″ l 16·18 l 15·94 l 15·16	″ l 15·76 l 17·10 l 17·22	″ l 12·92 l 13·60 l 12·92	″ l 13·92 l 13·78 l 14·60	″ l 15·64 l 14·38 l 13·56 l 15·88	″ l 16·64 l 16·10 l 16·04	M = 15″·27 w = 7·61 1/w = 0·13 C = 50° 58′ 15″·27
	16·51	14·89	15·58	14·88	15·76	16·69	13·15	14·10	14·87	16·26	
‡ XX (Chikk Nandihallígudd) and XXIV (Navalúr)	h 20·32 h 19·84 h 20·94	h 20·42 h 20·54 h 21·42	h 19·22 h 19·22 h 19·52	h 21·46 h 20·88 h 20·50	l 21·18 l 22·02 l 21·96	l 20·72 l 19·08 l 18·98	l 21·12 l 21·30 l 21·90	l 22·84 l 22·34 l 21·68	l 21·12 l 19·88 l 20·08	l 21·24 l 19·90 l 21·58	M = 20″·77 w = 10·70 1/w = 0·09 C = 98° 50′ 20″·77
	20·37	20·79	19·32	20·95	21·72	19·59	21·44	22·29	20·36	20·91	

Angle between	Circle readings, telescope being set on XXIV (Navalúr)										
	0° 0′	179° 59′	79° 12′	259° 12′	158° 35′	338° 36′	237° 37′	57° 37′	316° 46′	136° 46′	
§ XXIV (Navalúr) and XXVI (Ganigudd)	″ h 49·28 h 51·68 h 49·42	″ h 48·80 h 48·06 h 49·46	″ h 48·38 h 50·54 h 47·66 h 49·42	″ h 50·00 h 49·68 h 50·54	″ h 52·76 h 52·76 h 50·64	″ h 51·48 h 51·68 h 50·28	″ h 48·66 h 48·38 h 48·60	″ h 50·06 h 49·38 h 51·10	″ h 51·00 h 48·28 h 47·06 h 49·04 h 47·52	″ h 50·16 h 47·84 h 48·46	M = 49″·73 w = 5·88 1/w = 0·17 C = 82° 57′ 49″·72
	50·13	48·77	49·00	50·07	52·05	51·15	48·55	50·18	48·58	48·82	
§ XXVI (Ganigudd) and XXVIII (Kánsĕrudi)	h 7·92 h 9·64 h 6·78 h 9·56	h 9·82 h 7·30 h 9·34	h 7·46 h 5·40 h 7·30	h 6·86 h 7·42 h 6·32	h 4·76 h 4·84 h 7·12 h 7·78	h 7·42 h 7·34 h 7·18	h 9·32 h 7·40 h 9·64	h 8·34 h 6·16 h 8·10	h 8·42 h 10·54 h 10·36 h 7·62	h 7·84 h 8·76 h 8·90	M = 7″·84 w = 6·92 1/w = 0·14 C = 62° 4′ 7″·84
	8·48	8·82	6·72	6·87	6·13	7·31	8·79	7·53	9·24	8·50	

At XXVI (Ganigudd)

March* 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's 24-inch Theodolite No. 2.

Angle between	Circle readings, telescope being set on XXV (Kalkera) 359° 59′	179° 59′	79° 9′	259° 9′	158° 21′	338° 21′	237° 37′	57° 36′	316° 48′	136° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXV (Kalkera) and XXIV (Navalúr)	*h* 36·76	*l* 36·78	*h* 37·42	*l* 36·90	*h* 35·88	*h* 37·82	*l* 38·66	*h* 38·66	*h* 37·80	*h* 37·14	$M = 37''\cdot29$
	h 37·48	*h* 36·32	*h* 38·08	*l* 37·48	*h* 35·92	*h* 38·88	*l* 38·00	*h* 36·36	*l* 37·04	*h* 36·24	$w = 15\cdot27$
	h 37·36	*h* 36·20	*l* 37·70	*h* 37·84	*h* 35·78	*h* 39·44	*l* 36·90	*h* 37·02	*h* 37·58	*h* 36·58	$\frac{1}{w} = 0\cdot07$
					h 36·98						$C = 49°\ 8'\ 37''\cdot28$
	37·20	36·43	37·73	37·41	36·14	38·71	37·85	37·35	37·47	36·65	
XXIV (Navalúr) and XXVII (Kundgol)	*h* 42·34	*h* 40·34	*h* 41·98	*l* 42·40	*h* 41·58	*h* 41·34	*l* 40·78	*h* 39·72	*l* 42·36	*h* 41·20	$M = 41''\cdot15$
	h 41·82	*l* 40·02	*h* 41·98	*l* 41·34	*h* 42·78	*h* 38·88	*l* 41·20	*h* 40·08	*l* 38·84	*h* 41·86	$w = 7\cdot50$
	h 41·36	*h* 40·76	*l* 41·04	*h* 43·02	*h* 42·50	*h* 38·78	*l* 41·54	*h* 40·10	*l* 41·42	*h* 43·60	$\frac{1}{w} = 0\cdot13$
						h 38·90			*h* 38·42		$C = 51°\ 22'\ 41''\cdot13$
						h 39·50					
	41·84	40·37	41·67	42·25	42·29	39·48	41·17	39·97	40·26	42·22	
XXVII (Kundgol) and XXIX (Indúr)	*h* 48·06	*h* 48·32	*h* 48·74	*l* 48·38	*h* 48·66	*h* 50·72	*l* 50·16	*h* 51·76	*l* 48·58	*h* 49·08	$M = 49''\cdot65$
	h 49·96	*l* 50·32	*h* 48·42	*l* 48·58	*h* 50·16	*h* 51·50	*l* 48·68	*h* 50·28	*l* 51·66	*h* 49·78	$w = 11\cdot12$
	h 50·18	*h* 49·80	*h* 49·74	*h* 48·34	*h* 49·68	*h* 50·62	*l* 48·70	*h* 50·72	*h* 49·68	*h* 48·40	$\frac{1}{w} = 0\cdot09$
		d 50·09							*h* 51·58		$C = 62°\ 37'\ 49''\cdot65$
	49·40	49·63	48·97	48·43	49·50	50·95	49·18	50·92	50·38	49·09	
XXIX (Indúr) and XXX (Rámankŏp)	*h* 47·76	*h* 46·80	*h* 46·86	*l* 47·04	*l* 45·12	*l* 47·34	*l* 47·56	*h* 47·40	*l* 46·82	*h* 50·02	$M = 47''\cdot17$
	h 46·00	*l* 45·94	*h* 47·24	*l* 48·74	*l* 47·14	*l* 48·18	*l* 46·92	*h* 47·50	*l* 45·58	*h* 48·64	$w = 12\cdot66$
	h 47·00	*l* 45·46	*h* 46·10	*h* 45·74	*l* 47·38	*l* 46·22	*l* 48·02	*h* 47·04	*h* 45·98	*h* 48·66	$\frac{1}{w} = 0\cdot08$
		h 48·48			*l* 48·36					*h* 48·78	$C = 58°\ 40'\ 47''\cdot18$
		h 46·46									
	46·92	46·63	46·73	47·17	47·00	47·25	47·50	47·31	46·13	49·03	
XXX (Rámankŏp) and XXVIII Kánsĕrudi)	*h* 41·08	*h* 38·90	*l* 42·46	*l* 41·62	*l* 43·16	*l* 41·24	*l* 40·16	*h* 40·40	*l* 40·98	*h* 40·42	$M = 41''\cdot25$
	l 40·68	*h* 39·58	*l* 40·64	*h* 42·08	*l* 42·18	*l* 40·70	*l* 38·74	*h* 40·00	*l* 42·00	*h* 41·88	$w = 12\cdot08$
	l 40·76	*h* 41·26	*l* 42·94	*h* 40·80	*l* 42·26	*l* 43·00	*l* 41·58	*h* 41·10	*h* 42·50	*h* 40·86	$\frac{1}{w} = 0\cdot08$
		h 41·86									$C = 52°\ 13'\ 41''\cdot24$
	40·84	40·40	42·01	41·50	42·53	41·65	40·16	40·50	41·83	41·05	

At XXVI (Ganigudd)—(*Continued*).

Angle between	Circle readings, telescope being set on XXV (Kalkera) 359° 59′	179° 59′	79° 9′	259° 9′	158° 21′	338° 21′	237° 37′	57° 36′	316° 48′	136° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXVIII (Kánsĕrudi) and XXV (Kalkera)	″ *h* 23·78 *l* 24·96 *l* 24·64	″ *h* 24·90 *h* 24·06 *h* 24·80	″ *l* 24·30 *l* 23·92 *l* 22·36	″ *l* 22·44 *l* 22·32 *h* 23·86	″ *l* 22·26 *l* 20·40 *l* 21·12	″ *h* 21·88 *l* 22·36 *l* 22·12 *h* 23·10 *h* 24·90	″ *l* 23·62 *l* 25·08 *l* 23·00	″ *h* 24·86 *h* 24·72 *h* 23·80	″ *l* 26·08 *l* 23·04 *h* 24·06 *l* 24·82	″ *h* 23·42 *h* 24·62 *h* 23·76	$M = 23''\cdot64$ $w = 7\cdot69$ $\frac{1}{w} = 0\cdot13$ $C = 85^\circ\,56'\,23''\cdot64$
	24·46	24·59	23·53	22·87	21·26	22·87	23·90	24·46	24·50	23·93	

At XXVII (Kundgol)

March 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXIX (Indúr) 0° 0′	180° 0′	79° 13′	259° 13′	158° 24′	338° 24′	237° 35′	57° 35′	316° 48′	136° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXIX (Indúr) and XXVI (Ganigudd)	″ *h* 56·82 *h* 54·90 *h* 55·40	″ *h* 58·32 *h* 57·88 *h* 56·96	″ *h* 56·26 *h* 55·48 *h* 57·56	″ *h* 53·44 *h* 54·46 *h* 54·80	″ *h* 56·36 *l* 56·76 *l* 55·16 *l* 54·84	″ *l* 58·72 *l* 57·66 *l* 58·42	″ *h* 53·10 *h* 55·80 *h* 53·96	″ *h* 56·44 *h* 55·64 *h* 57·86	″ *h* 54·66 *h* 54·48 *l* 53·46	″ *h* 55·68 *h* 56·88 *l* 55·42	$M = 55''\cdot93$ $w = 4\cdot51$ $\frac{1}{w} = 0\cdot22$ $C = 46^\circ\,59'\,55''\cdot93$
	55·71	57·72	56·43	54·23	55·78	58·27	54·29	56·65	54·20	55·99	
XXVI (Ganigudd) and XXIV (Navalúr)	*h* 52·18 *h* 51·26 *h* 52·52 *h* 50·76	*h* 50·82 *h* 50·94 *h* 50·18	*h* 54·00 *h* 53·36 *h* 51·96	*h* 51·86 *h* 52·72 *h* 48·90 *h* 49·68 *h* 52·56	*h* 50·38 *l* 50·42 *l* 53·12 *l* 53·14	*l* 48·46 *l* 47·90 *l* 49·24	*h* 53·42 *h* 51·54 *h* 54·90 *h* 53·02	*h* 51·24 *h* 50·56 *h* 50·82 *h* 53·62 *h* 52·62	*h* 53·08 *h* 51·22 *l* 53·12 *d* 51·04	*h* 53·46 *h* 51·14 *h* 54·56 *l* 52·06 *d* 50·91	$M = 51''\cdot64$ $w = 4\cdot60$ $\frac{1}{w} = 0\cdot22$ $C = 44^\circ\,35'\,51''\cdot65$
	51·68	50·65	53·11	51·14	51·77	48·53	53·22	51·77	52·12	52·43	

At XXVIII (Kánsĕrudi)

February 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXV (Kalkera) 0° 0′	179° 59′	79° 4′	259° 4′	158° 22′	338° 22′	237° 36′	57° 36′	316° 47′	136° 47′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXV (Kalkera) and XXVI (Ganigudd)	″ *h* 31·40 *h* 32·64 *h* 32·04	″ *l* 33·02 *h* 30·28 *h* 31·82	″ *h* 33·62 *h* 31·98 *h* 32·52	″ *h* 30·82 *h* 29·34 *h* 29·56	″ *h* 32·40 *h* 30·56 *h* 31·90	″ *h* 31·36 *h* 28·64 *h* 29·74	″ *h* 31·00 *h* 29·30 *h* 30·36	″ *l* 30·36 *h* 30·74 *h* 29·84	″ *h* 31·88 *h* 30·16 *h* 31·42	″ *h* 32·04 *h* 32·62 *h* 31·10	$M = 31''\cdot15$ $w = 8\cdot30$ $\frac{1}{w} = 0\cdot12$ $C = 31^\circ\,59'\,31''\cdot15$
	32·03	31·71	32·71	29·91	31·62	29·91	30·22	30·31	31·15	31·92	

At XXVIII (Kánsĕrudi)—(*Continued*).

Angle between	Circle readings, telescope being set on XXV (Kalkera) 0° 0′	179° 59′	79° 4′	259° 4′	158° 22′	338° 22′	237° 36′	57° 36′	316° 47′	136° 47′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXVI (Ganigudd) and XXX (Rámankŏp)	″ h 47·38 h 48·54 h 46·82	″ h 46·60 h 47·92 h 47·38	″ h 48·14 h 46·08 h 45·06	″ h 47·76 h 49·06 h 46·60	″ h 47·20 h 49·50 h 46·66 h 48·78	″ h 47·98 h 47·98 h 48·16	″ h 47·34 h 49·62 h 48·82	″ l 47·50 l 45·80 h 49·84 h 47·38	″ h 47·70 h 48·16 h 46·70	″ h 46·14 h 43·28 h 44·72 h 44·80	$M = 47''\cdot37$ $w = 6\cdot79$ $\frac{1}{w} = 0\cdot15$ $C = 64^\circ 10' 47''\cdot36$
	47·58	47·30	46·43	47·81	48·04	48·04	48·59	47·63	47·52	44·74	

At XXIX (Indúr)

March and April 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXXII (Karĕkyatanhalli) 0° 2′	180° 1′	79° 10′	259° 10′	158° 23′	338° 23′	237° 36′	57° 36′	316° 46′	136° 46′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXII (Karĕkyatanhalli) and XXXI (Bhedasgávegudda)	″ h 31·06 h 28·84 h 30·90	″ h 28·90 h 28·98 h 30·26	″ h 27·72 h 27·94 h 29·70	″ h 28·00 h 29·52 h 29·04	″ h 28·58 h 28·52 h 29·14	″ h 30·62 h 30·76 h 29·62	″ h 31·60 h 29·42 h 30·76	″ h 30·34 h 29·74 h 29·54	″ h 27·32 h 27·38 h 32·00 h 31·20 h 31·92 h 33·00	″ h 31·88 h 29·78 h 29·70	$M = 29''\cdot74$ $w = 9\cdot03$ $\frac{1}{w} = 0\cdot11$ $C = 53^\circ\ 2' 29''\cdot76$
	30·27	29·38	28·45	28·85	28·75	30·33	30·59	29·87	30·47	30·45	
XXXI (Bhedasgávegudda) and XXX (Rámankŏp)	h 24·20 h 24·70 h 23·86	h 24·96 h 24·74 h 22·52 h 22·46	h 22·58 h 24·44 h 24·20	h 23·92 h 24·48 h 22·28	h 22·70 h 21·58 h 23·72	h 21·60 h 23·32 h 22·02	h 23·08 h 21·76 h 23·16	h 23·26 h 23·00 h 23·18	h 24·46 h 22·24 h 21·26 h 24·04	h 23·36 h 24·32 h 26·20 h 20·00 h 24·32 h 23·48	$M = 23''\cdot26$ $w = 13\cdot58$ $\frac{1}{w} = 0\cdot07$ $C = 59^\circ 13' 23''\cdot27$
	24·25	23·67	23·74	23·56	22·67	22·31	22·67	23·15	23·00	23·61	
XXX (Rámankŏp) and XXVI (Ganigudd)	h 33·84 h 33·60 h 33·72	h 36·68 h 34·64 h 35·78	h 35·48 h 35·76 h 33·72 h 35·76 h 36·34 h 35·36	h 35·82 h 34·92 h 34·68 h 36·10	h 34·16 h 36·62 h 34·48	h 35·78 h 33·36 h 35·70	h 36·56 h 36·96 h 36·26	h 35·46 h 36·20 h 35·94	h 34·84 h 36·92 h 36·60	h 34·82 h 36·28 h 34·64	$M = 35''\cdot41$ $w = 12\cdot76$ $\frac{1}{w} = 0\cdot08$ $C = 67^\circ 15' 35''\cdot41$
	33·72	35·70	35·40	35·38	35·09	34·95	36·59	35·87	36·12	35·25	

At XXIX (Indúr)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXII (Karĕkyatanhalli) 0° 2′	180° 1′	79° 10′	259° 10′	158° 23′	338° 23′	237° 36′	57° 36′	316° 46′	136° 46′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXVI (Ganigudd) and XXVII (Kundgol)	″ h 14·18 h 16·40 h 14·62	″ h 17·96 h 17·88 h 17·00	″ h 16·14 h 15·16 h 14·84	″ h 16·16 h 16·76 h 16·46 h 16·88	″ h 17·66 h 18·50 h 18·32	″ h 14·70 h 16·92 h 16·82	″ h 13·70 h 15·36 h 18·12 h 16·86 h 16·62	″ h 16·10 h 16·62 h 15·10	″ h 14·48 h 16·62 h 15·58	″ h 17·90 h 15·72 h 18·68	$M = 16''\cdot40$ $w = 7\cdot51$ $\frac{1}{w} = 0\cdot13$ $C = 70° 22' 16''\cdot40$
	15·07	17·61	15·38	16·57	18·16	16·15	16·13	15·94	15·56	17·43	

At XXX (Rámankŏp)

***March* 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24*-inch Theodolite No.* 2.**

Angle between	Circle readings, telescope being set on XXVIII (Kánsĕrudi) 0° 1′	180° 1′	79° 18′	259° 18′	158° 24′	338° 24′	237° 37′	57° 37′	316° 47′	136° 47′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXVIII (Kánsĕrudi) and XXVI (Ganigudd)	″ h 32·50 h 31·46 h 32·12	″ h 34·02 h 34·08 h 32·60	″ h 35·94 h 35·04 h 31·60 h 34·08	″ l 32·00 h 35·02 h 32·60	″ h 32·48 h 33·86 h 32·06	″ h 33·56 h 33·66 h 31·84	″ h 32·00 h 32·66 h 31·54	″ h 33·46 h 33·66 h 33·82	″ h 33·18 h 32·10 h 31·00	″ h 33·30 h 32·82 h 32·00	$M = 32''\cdot93$ $w = 12\cdot31$ $\frac{1}{w} = 0\cdot08$ $C = 63° 35' 32''\cdot94$
	32·03	33·57	34·17	33·21	32·80	33·02	32·07	33·65	32·09	32·71	
XXVI (Ganigudd) and XXIX (Indúr)	h 38·58 h 39·90 h 40·72 h 39·68	h 39·10 h 38·22 h 37·86	h 39·14 h 40·88 h 40·10	l 40·74 l 39·90 l 38·68	h 38·76 h 38·58 h 36·74 h 38·04	h 38·08 h 39·80 h 40·82 h 38·74 h 39·20	h 39·06 h 41·04 h 41·90 h 38·88	h 37·74 h 39·12 h 40·10	h 39·48 h 41·06 h 41·52	h 38·78 h 40·00 h 40·02	$M = 39''\cdot48$ $w = 11\cdot13$ $\frac{1}{w} = 0\cdot09$ $C = 54° 3' 39''\cdot48$
	39·72	38·39	40·04	39·77	38·03	39·33	40·22	38·99	40·69	39·60	
XXIX (Indúr) and XXXI (Bhedasgávegudda)	h 5·88 h 4·68 h 4·14	h 3·22 h 4·46 h 5·40	h 4·88 h 2·96 h 4·34	l 4·48 l 5·14 l 6·42	h 4·20 h 3·32 h 6·14 h 5·30	h 5·26 h 4·30 h 4·02	h 4·80 h 3·98 h 1·96 h 8·36	h 4·60 h 5·80 h 6·78 h 3·98	h 4·92 h 4·86 h 5·50	h 4·60 h 2·78 h 4·28	$M = 4''\cdot70$ $w = 15\cdot68$ $\frac{1}{w} = 0\cdot06$ $C = 58° 51' 4''\cdot71$
	4·90	4·36	4·06	5·35	4·74	4·53	4·78	5·29	5·09	3·89	

At XXX (Rámankŏp)—(*Continued*).

Angle between	0° 1′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 47′	136° 47′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XXVIII (Kánsĕrudi)										
XXXI (Bhedasgávegudda) and XXXIII (Menshigudda)	″ h 39·82 h 39·66 h 40·74	″ h 40·90 h 41·88 h 40·84	″ h 39·90 h 41·54 h 40·40	″ l 39·98 l 41·52 l 38·46 h 39·74	″ h 41·90 h 43·32 h 43·26	″ h 41·02 h 42·54 h 39·84	″ h 41·32 h 42·08 h 41·58	″ h 41·26 h 40·16 h 41·04	″ h 41·30 h 40·56 h 40·06	″ h 40·46 h 41·08 h 39·96	$M = 40''·94$ $w = 11·45$ $\frac{1}{w} = 0·09$ $C = 58° 7' 40''·94$
	40·07	41·21	40·61	39·93	42·83	41·13	41·66	40·82	40·64	40·50	

At XXXI (Bhedasgávegudda)

April 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	0° 0′	180° 0′	79° 12′	259° 12′	158° 25′	338° 25′	237° 35′	57° 35′	316° 47′	136° 47′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XXXIV (Chandragutti)										
XXXIV (Chandragutti) and XXXV (Halĕbail)	″ h 14·94 h 16·46 d 15·96	″ h 13·38 h 12·98 h 13·90 h 14·58	″ h 15·86 d 17·90 d 14·30 d 17·90	″ h 15·08 h 14·86 h 17·24	″ h 14·08 h 14·12 h 12·16	″ h 14·22 h 15·64 h 15·56	″ h 13·96 h 13·04 h 15·28	″ h 16·62 h 15·18 h 14·94	″ h 13·38 h 13·86 h 13·52	″ h 16·14 h 16·30 h 15·50	$M = 14''·96$ $w = 6·56$ $\frac{1}{w} = 0·15$ $C = 43° 35' 14''·96$
	15·79	13·71	16·49	15·73	13·45	15·14	14·09	15·58	13·59	15·98	
XXXV (Halĕbail) and XXXIII (Menshigudda)	h 32·82 h 32·86 h 31·86	h 35·66 h 35·90 h 33·78	h 31·24 h 34·38 h 33·38 h 33·56 h 33·18	h 33·40 h 33·18 d 31·58	h 32·98 h 35·08 h 36·46 h 33·78 h 31·50 d 36·35	h 36·60 h 33·88 h 34·86 d 33·76	h 31·64 h 34·26 h 33·38 h 33·88 h 34·30	h 32·80 h 33·24 h 32·82	h 32·60 h 31·98 h 31·32	h 31·34 h 32·26 h 32·58	$M = 33''·31$ $w = 6·44$ $\frac{1}{w} = 0·16$ $C = 38° 53' 33''·33$
	32·51	35·11	33·15	32·72	34·36	34·78	33·49	32·95	31·97	32·06	
XXXIII (Menshigudda) and XXX (Rámankŏp)	h 29·16 h 28·86 h 30·08	h 29·36 h 29·96 h 29·34	l 28·30 l 28·20 l 28·80	l 27·64 l 27·28 l 29·42	h 29·76 l 27·14 l 28·62	h 28·28 h 28·22 l 27·26 h 29·04	h 30·00 h 30·48 h 29·50 h 28·76	h 29·32 h 29·62 h 27·98	h 28·88 h 30·02 h 31·40 h 29·74	h 28·20 h 27·62 h 28·98	$M = 28''·91$ $w = 15·47$ $\frac{1}{w} = 0·06$ $C = 61° 29' 28''·92$
	29·37	29·55	28·43	28·11	28·51	28·20	29·69	28·97	30·01	28·27	

At XXXI (Bhedasgávegudda)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXIV (Chandragutti) 0° 0′	180° 0′	79° 12′	259° 12′	158° 25′	338° 25′	237° 35′	57° 35′	316° 47′	136° 47′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXX (Rámankŏp)	*h* 34·14	*h* 34·12	*l* 33·74	*l* 34·82	*h* 33·96	*h* 34·34	*h* 34·16	*h* 36·16	*h* 34·02	*h* 35·20	$M = 34''\cdot37$
and	*h* 33·24	*h* 35·16	*l* 35·14	*l* 35·32	*l* 34·64	*h* 33·56	*h* 34·44	*h* 34·26	*h* 34·62	*h* 33·70	$w = 20\cdot50$
XXIX (Indúr)	*h* 34·30	*h* 35·06	*l* 35·86	*l* 34·80	*l* 34·70	*l* 34·54	*h* 31·56	*h* 34·56	*h* 32·76	*h* 32·74	$\frac{1}{w} = 0\cdot05$
							h 36·16				
							h 33·34				$C = 61^\circ\ 55'\ 34''\cdot36$
	33·89	34·78	34·91	34·98	34·43	34·15	33·93	34·99	33·80	33·88	
XXIX (Indúr)	*h* 25·86	*h* 24·60	*l* 25·34	*l* 24·40	*h* 26·20	*h* 25·44	*h* 25·66	*h* 23·68	*h* 26·08	*h* 28·56	$M = 25''\cdot86$
and	*h* 26·66	*h* 23·06	*l* 24·62	*l* 26·60	*l* 25·00	*h* 27·88	*h* 27·02	*h* 26·70	*h* 25·96	*h* 26·34	$w = 9\cdot36$
XXXII (Karĕkyatanhalli)	*h* 24·30	*h* 25·08	*l* 25·02	*l* 25·32	*l* 24·90	*l* 27·14	*h* 26·26	*h* 26·66	*h* 27·96	*h* 26·84	$\frac{1}{w} = 0\cdot11$
				d 26·28				*h* 25·44			
								d 25·88			$C = 88^\circ\ 16'\ 25''\cdot86$
	25·61	24·25	24·99	25·65	25·37	26·82	26·31	25·67	26·67	27·25	
XXXII (Karĕkyatanhalli)	*h* 44·46	*h* 45·48	*l* 43·38	*h* 43·14	*h* 41·86	*h* 42·36	*h* 41·90	*h* 41·40	*h* 40·12	*h* 38·66	$M = 42''\cdot10$
and	*h* 42·52	*h* 43·88	*l* 41·88	*l* 41·68	*h* 40·58	*h* 40·28	*h* 41·50	*h* 41·46	*h* 42·58	*h* 42·54	$w = 7\cdot48$
XXXIV (Chandragutti)	*h* 41·66	*h* 43·12	*l* 43·40	*l* 40·00	*h* 41·64	*h* 39·14	*h* 41·64	*h* 43·74	*h* 40·70	*h* 43·18	$\frac{1}{w} = 0\cdot13$
	h 42·62			*l* 43·54		*h* 42·08				*h* 42·54	$C = 65^\circ\ 49'\ 42''\cdot09$
	42·82	44·16	42·89	42·09	41·36	40·97	41·68	42·20	41·13	41·73	

At XXXII (Karĕkyatanhalli)

April 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXXIV (Chandragutti) 359° 59′	179° 59′	79° 13′	259° 13′	158° 23′	338° 24′	237° 36′	57° 36′	316° 47′	136° 47′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXIV (Chandragutti)	*h* 13·52	*h* 14·52	*l* 15·24	*l* 14·62	*h* 13·66	*h* 14·38	*h* 13·74	*h* 13·88	*h* 13·68	*h* 13·20	$M = 14''\cdot25$
and	*h* 13·78	*h* 14·66	*l* 14·86	*l* 15·38	*h* 15·66	*h* 14·88	*h* 14·20	*h* 13·34	*h* 14·46	*h* 13·68	$w = 11\cdot71$
XXXI (Bhedasgávegudda)	*h* 16·34	*h* 14·18	*l* 13·22	*l* 15·92	*h* 15·26	*d* 13·16	*h* 11·86	*h* 15·60	*l* 11·60	*h* 13·14	$\frac{1}{w} = 0\cdot09$
	h 16·84										$C = 60^\circ\ 8'\ 14''\cdot26$
	15·12	14·45	14·44	15·31	14·86	14·14	13·27	14·27	13·25	13·34	

At XXXII (Karĕkyatanhalli)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXIV (Chandragutti) 359° 59′	179° 59′	79° 13′	259° 13′	158° 23′	338° 24′	237° 36′	57° 36′	316° 47′	136° 47′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXI (Bhedasgávegudda) and XXIX (Indúr)	″ h 9·38 h 8·94 h 5·40 h 6·46 h 6·20 d 7·18	″ h 5·70 h 5·52 h 6·20	″ l 5·50 l 4·06 l 6·86 l 6·64	″ l 6·12 l 5·56 l 4·96	″ h 7·10 h 5·76 h 5·08	″ h 7·06 h 7·34 h 8·00	″ h 6·06 h 5·48 l 7·28	″ h 7·02 h 6·12 d 6·75	″ h 5·22 h 5·02 l 7·12	″ h 7·28 h 7·52 h 8·08	$M = 6''\cdot42$ $w = 11\cdot78$ $\frac{1}{w} = 0\cdot08$ $C = 38°\,41'\,6''\cdot43$
	7·26	5·81	5·77	5·55	5·98	7·47	6·27	6·63	5·79	7·63	

At XXXIII (Menshigudda)

April and May 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXX (Rámankŏp) 0° 0′	180° 0′	79° 1′	259° 1′	158° 39′	338° 39′	238° 1′	58° 1′	316° 43′	136° 43′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXX (Rámankŏp) and XXXI (Bhedasgávegudda)	″ h 51·62 h 50·98 h 50·90	″ h 52·40 h 49·88 h 53·26 h 51·82 h 50·90	″ h 49·70 h 50·50 h 52·40 h 52·32	″ h 50·42 h 51·94 h 53·34 h 51·42	″ h 53·24 h 52·50 h 51·16	″ h 50·82 h 51·64 d 49·78	″ h 49·82 h 50·42 h 49·02	″ l 49·94 l 49·78 l 51·16	″ h 49·68 h 50·44 h 54·18 h 47·88 h 49·84	″ h 49·40 h 51·32 h 51·56	$M = 51''\cdot01$ $w = 10\cdot24$ $\frac{1}{w} = 0\cdot10$ $C = 60°\,22'\,51''\cdot02$
	51·17	51·65	51·23	51·78	52·30	50·75	49·75	50·29	50·40	50·76	
XXXI (Bhedasgávegudda) and XXXIV (Chandragutti)	h 15·46 h 12·54 h 15·08 h 15·32	h 12·26 h 12·92 h 11·78 h 14·14 h 14·16 h 13·90	h 14·70 h 15·20 h 14·64	h 15·80 h 14·94 h 13·00 h 15·04	h 13·86 h 13·00 h 14·00	h 16·18 h 16·80 h 16·10	l 14·72 l 15·82 l 16·20	h 14·20 h 14·38 h 14·98	h 15·36 h 17·22 h 13·14 h 17·10	h 17·02 h 15·64 h 14·80	$M = 14''\cdot90$ $w = 8\cdot05$ $\frac{1}{w} = 0\cdot12$ $C = 59°\,27'\,14''\cdot88$
	14·60	13·19	14·85	14·70	13·62	16·36	15·58	14·52	15·71	15·82	
XXXIV (Chandragutti) and XXXV (Halĕbail)	h 20·28 h 18·48 d 18·22	h 17·66 h 18·16 h 17·88	h 19·22 h 18·20 h 18·88	h 16·72 h 16·34 h 17·08	h 18·44 h 18·46 h 17·96	h 16·68 h 16·80 h 16·58	h 15·98 h 16·62 h 17·34	h 18·10 h 19·36 h 17·48	h 18·08 h 16·84 h 16·58	h 17·00 h 17·42 h 17·96	$M = 17''\cdot69$ $w = 11\cdot50$ $\frac{1}{w} = 0\cdot09$ $C = 43°\,35'\,17''\cdot69$
	18·99	17·90	18·77	16·71	18·29	16·69	16·65	18·31	17·17	17·46	

At XXXIV (Chandragutti)

* *May* 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.
† *December* 1872; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XL (Hŏnnavalli)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 49′	
† XL (Hŏnnavalli) and XXXIX (Koramúr)	″ *l* 28·78 *l* 29·04 *h* 27·37	″ *l* 28·57 *l* 29·22 *l* 28·41	″ *l* 29·06 *l* 28·69 *l* 29·13	″ *l* 30·45 *l* 28·63 *l* 29·42	″ *h* 29·17 *h* 29·04 *h* 28·46	″ *h* 29·80 *h* 28·09 *h* 29·75	″ *l* 29·52 *l* 27·52 *l* 27·91	″ *l* 28·84 *l* 28·42 *l* 28·70	″ *h* 29·64 *h* 29·47 *h* 28·31	″ *h* 29·81 *h* 30·25 *h* 28·50	$M = 28''\cdot93$ $w = 33\cdot30$ $\frac{1}{w} = 0\cdot03$ $C = 49^\circ\ 25'\ 28''\cdot93$
	28·40	28·73	28·96	29·50	28·89	29·21	28·32	28·65	29·14	29·52	
† XXXIX (Koramúr) and XXXVI (Hukaligudda)	*l* 10·98 *l* 11·49 *l* 11·17	*h* 11·27 *h* 11·55 *l* 12·27	*l* 10·55 *l* 10·49 *l* 11·53	*l* 11·68 *l* 10·84 *l* 9·92	*h* 10·49 *h* 11·56 *h* 10·37	*h* 12·22 *h* 11·09 *h* 11·92	*l* 10·17 *l* 12·81 *l* 11·24 *l* 11·24	*l* 11·31 *l* 10·79 *l* 10·16	*h* 10·89 *h* 11·68 *h* 12·22	*h* 9·76 *h* 10·33 *h* 11·47	$M = 11''\cdot14$ $w = 31\cdot62$ $\frac{1}{w} = 0\cdot03$ $C = 54^\circ\ 44'\ 11''\cdot14$
	11·21	11·70	10·86	10·81	10·81	11·74	11·37	10·75	11·60	10·52	
† XXXVI (Hukaligudda) and XXXV (Halĕbail)	*l* 47·34 *l* 47·75 *h* 46·91	*h* 46·96 *h* 45·87 *l* 45·38	*l* 48·04 *l* 47·23 *h* 48·01	*l* 46·07 *l* 47·70 *h* 47·25	*l* 46·65 *l* 46·70 *l* 47·07	*h* 45·18 *h* 45·36 *l* 45·42	*l* 48·07 *l* 46·44 *l* 47·76	*l* 45·78 *l* 46·60 *l* 47·40	*h* 47·79 *h* 46·89 *h* 46·40	*h* 46·96 *h* 47·31 *h* 46·69	$M = 46''\cdot83$ $w = 16\cdot90$ $\frac{1}{w} = 0\cdot06$ $C = 51^\circ\ 30'\ 46''\cdot83$
	47·33	46·07	47·76	47·01	46·81	45·32	47·42	46·59	47·03	46·99	
	Circle readings, telescope being set on XXXV (Halĕbail)										
	0° 8′	180° 3′	79° 12′	259° 12′	158° 27′	338° 27′	237° 36′	57° 36′	316° 49′	136° 49′	
* XXXV (Halĕbail) and XXXIII (Menshigudda)	″ *h* 36·62 *h* 38·54 *h* 35·80 *h* 38·50	″ *h* 36·96 *h* 37·98 *h* 35·32 *h* 37·60	″ *h* 38·18 *h* 36·86 *h* 37·56	″ *h* 35·62 *h* 38·02 *h* 36·62 *d* 35·82	″ *h* 36·60 *h* 37·42 *h* 38·36	″ *h* 36·72 *h* 35·50 *h* 37·16	″ *h* 36·54 *h* 35·56 *h* 36·70	″ *h* 37·80 *h* 38·92 *h* 37·50	″ *h* 38·76 *h* 38·16 *d* 36·77 *d* 34·90 *d* 37·76 *d* 34·38	″ *h* 37·94 *h* 39·54 *h* 36·32 *h* 35·58 *d* 38·02	$M = 37''\cdot09$ $w = 15\cdot26$ $\frac{1}{w} = 0\cdot07$ $C = 38^\circ\ 53'\ 37''\cdot08$
	37·37	36·97	37·53	36·52	37·46	36·46	36·27	38·07	36·79	37·48	
* XXXIII (Menshigudda) and XXXI (Bhedasgávegudda)	*h* 60·92 *h* 59·46 *h* 60·24	*h* 60·82 *h* 59·54 *h* 60·16	*h* 60·98 *h* 61·18 *h* 60·48	*h* 62·14 *h* 60·72 *h* 62·58	*h* 62·10 *h* 62·42 *h* 60·98	*h* 60·64 *h* 61·12 *h* 61·40	*h* 60·68 *h* 60·82 *h* 60·82	*h* 61·18 *h* 60·26 *h* 59·58	*h* 62·38 *h* 59·56 *h* 59·40 *d* 59·01 *d* 60·62	*h* 58·28 *h* 58·88 *h* 61·92 *h* 60·80 *d* 60·41	$M = 60''\cdot73$ $w = 15\cdot36$ $\frac{1}{w} = 0\cdot07$ $C = 38^\circ\ 4'\ 0''\cdot71$
	60·21	60·17	60·88	61·81	61·83	61·05	60·77	60·34	60·19	60·06	

At XXXIV (Chandragutti)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXV (Halĕbail) 0° 3′	180° 3′	79° 12′	259° 12′	158° 27′	338° 27′	237° 36′	57° 36′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
*	″	″	″	″	″	″	″	″	″	″	
XXXI (Bhedasgávegudda)	h 6·86	h 7·04	h 5·26	h 7·24	h 6·94	h 8·18	h 7·32	h 8·72	h 8·34	h 8·42	$M = 7''\cdot35$
and	h 7·02	h 8·62	h 5·88	h 6·46	h 6·04	h 7·96	h 7·80	h 8·24	h 7·30	h 8·76	$w = 17\cdot90$
XXXII (Karĕkyatanhalli)	h 7·44	h 7·24	h 7·20	h 7·02	h 7·52	h 7·28	h 6·42	h 7·74	h 6·40	h 7·68	$\frac{1}{w} = 0\cdot06$
	7·11	7·63	6·11	6·91	6·83	7·81	7·18	8·23	7·35	8·29	$C = 54^\circ\ 2'\ 7''\cdot35$

At XXXV (Halĕbail)

‡ *May* 1867; *observed by Lieutenant H. Trotter, R.E., with Barrow's* 24-*inch Theodolite No.* 2.
§ *November and December* 1872; *observed by Lieutenant J. R. McCullagh, R. E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIII (Menshigudda) 0° 1′	180° 1′	79° 12′	259° 11′	158° 25′	338° 25′	237° 36′	57° 36′	316° 25′	136° 25′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
‡	″	″	″	″	″	″	″	″	″	″	
XXXIII (Menshigudda)	l 57·00	l 57·48	h 56·56	h 58·12	h 58·82	h 56·34	h 55·70	h 58·82	l 56·66	l 57·52	$M = 57''\cdot21$
and	l 56·98	l 57·58	h 57·42	h 56·58	h 57·50	h 57·16	h 56·86	h 57·24	l 55·84	l 58·58	$w = 15\cdot20$
XXXI (Bhedasgávegudda)	l 54·72	l 57·40	h 58·68	h 56·10	h 58·14	h 57·24	h 57·70	h 58·30	l 56·16	l 57·10	$\frac{1}{w} = 0\cdot07$
	56·23	57·49	57·55	56·93	58·15	56·91	56·75	58·12	56·22	57·73	$C = 38^\circ\ 3'\ 57''\cdot21$
‡	l 11·34	l 9·34	h 11·18	h 9·88	h 10·72	h 1c·90	h 12·20	h 7·22	l 9·82	l 10·32	$M = 10''\cdot46$
XXXI (Bhedasgávegudda)	l 12·44	l 9·38	h 9·30	h 9·58	h 10·20	h 10·24	h 10·50	h 9·72	l 11·80	l 11·28	$w = 11\cdot55$
and	l 12·48	l 10·86	h 10·36	h 10·26	h 9·46	h 10·90	h 9·74	h 9·34	l 10·88	l 11·42	$\frac{1}{w} = 0\cdot09$
XXXIV (Chandragutti)								h 9·54			
	12·09	9·86	10·28	9·91	10·13	10·68	10·81	8·96	10·83	11·01	$C = 59^\circ\ 27'\ 10''\cdot45$

Angle between	Circle readings, telescope being set on XXXIV (Chandragutti) 120° 6′	300° 6′	199° 19′	19° 19′	278° 30′	98° 30′	357° 42′	177° 42′	76° 54′	256° 54′	
§	″	″	″	″	″	″	″	″	″	″	$M = 25''\cdot58$
XXXIV (Chandragutti)	l 25·50	l 25·30	l 25·61	l 25·33	l 26·47	l 26·03	h 25·67	h 26·51	h 24·81	h 26·02	$w = 24\cdot40$
and	l 26·45	l 24·56	l 24·54	l 25·04	l 26·45	l 24·77	h 26·94	h 25·72	h 24·12	h 25·62	$\frac{1}{w} = 0\cdot04$
XXXVI (Hukaligudda)	l 26·58	l 25·61	l 26·48	l 24·47	l 25·03	l 24·64	h 26·88	h 25·26	h 25·60	h 25·41	$C = 56^\circ\ 42'\ 25''\cdot58$
	26·18	25·16	25·54	24·95	25·98	25·15	26·49	25·83	24·84	25·68	
§	l 14·05	l 12·81	l 12·47	l 13·62	l 13·51	l 12·74	h 13·51	h 13·05	h 14·50	h 15·79	$M = 13''\cdot93$
XXXVI (Hukaligudda)	l 14·09	l 12·47	l 14·23	l 13·05	l 13·77	l 13·93	h 13·92	h 15·29	h 15·03	h 15·03	$w = 11\cdot24$
and	l 13·50	l 13·60	l 12·67	l 14·c5	l 13·14	l 12·24	h 14·96	h 16·04	h 15·22	h 15·10	$\frac{1}{w} = 0\cdot09$
XXXVII (Kaltigudda)								h 15·37			
	13·88	12·96	13·12	13·57	13·47	12·97	14·13	14·94	14·92	15·31	$C = 63^\circ\ 22'\ 13''\cdot93$

At XXXVI (Hukaligudda)

December 1872; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XXXIV (Chandragutti)										
	″	″	″	″	″	″	″	″	″	″	
XXXIV (Chandragutti) and XXXIX (Koramúr)	l 43·96 l 45·55 l 44·92	l 43·83 l 45·44 h 44·36	l 44·91 l 44·55 l 45·19	l 44·19 l 43·39 l 45·17	h 46·87 h 45·98 h 45·03	h 45·85 h 44·72 h 45·64	h 44·92 h 44·62 h 44·90	h 44·25 h 43·79 h 45·18	h 45·86 l 43·15 l 43·44 h 44·24	h 45·06 l 44·50 h 44·47	$M = 44''·79$ $w = 23·53$ $\frac{1}{w} = 0·04$ $C = 74° 27' 44''·78$
	44·81	44·54	44·88	44·25	45·96	45·40	44·81	44·41	44·17	44·68	
XXXIX (Koramúr) and XXXVIII (Dindĕmane)	l 57·57 l 57·29 l 57·21	l 56·85 l 56·45 h 58·25	l 58·22 l 56·72 l 57·45	l 57·40 l 56·71 l 56·33 h 57·34	h 56·99 h 56·97 h 56·42	h 57·51 h 56·72 h 57·63	h 57·37 h 58·83 h 57·56	h 56·59 h 58·15 h 56·96	h 57·24 l 58·46 l 58·05	l 56·85 l 56·64 h 58·55	$M = 57''·34$ $w = 42·29$ $\frac{1}{w} = 0·02$ $C = 82° 41' 57''·34$
	57·36	57·18	57·46	56·95	56·79	57·29	57·92	57·23	57·92	57·35	
XXXVIII (Dindĕmane) and XXXVII (Kaltigudda)	l 40·84 l 41·05 h 38·35 l 39·71	l 41·03 l 41·78 h 38·68 l 40·33	l 40·50 l 41·31 l 39·74	l 41·49 l 41·14 l 41·62 l 39·23	h 38·87 h 38·80 h 38·94	h 39·33 h 38·76 h 38·57	h 38·31 h 39·29 h 39·56 h 40·44	h 38·87 h 38·42 h 39·81	h 39·06 l 40·76 l 40·90	l 40·57 l 41·15 h 39·26	$M = 39''·86$ $w = 13·10$ $\frac{1}{w} = 0·08$ $C = 87° 18' 39''·87$
	39·99	40·46	40·52	40·87	38·87	38·89	39·40	39·03	40·24	40·33	
XXXVII (Kaltigudda) and XXXV (Halĕbail)	l 46·72 l 46·91 h 47·81	l 48·20 h 49·65 l 46·35 l 46·37	l 47·08 l 46·98 l 47·92	l 47·15 l 47·18 l 46·99	h 47·84 h 47·06 h 48·08	h 48·42 h 48·47 h 48·21	h 47·44 h 48·14 h 47·82	h 48·56 h 48·19 h 48·69	h 48·39 l 47·01 l 46·20 *l 45·86	h 47·34 l 47·43 l 47·77	$M = 47''·59$ $w = 24·30$ $\frac{1}{w} = 0·04$ $C = 43° 44' 47''·58$
	47·15	47·64	47·33	47·11	47·66	48·37	47·80	48·48	46·87	47·51	
XXXV (Halĕbail) and XXXIV (Chandragutti)	l 50·22 l 49·89 h 50·96	l 48·63 h 50·57 l 48·87	l 48·92 l 49·65 l 49·96	l 49·83 l 49·25 l 51·20	h 49·92 h 50·71 h 50·02	h 51·07 h 50·27 h 50·46	h 51·04 h 49·75 h 49·49	h 51·19 h 50·52 h 50·31	l 49·51 l 50·54 l 49·90	h 50·88 l 49·94 l 49·82	$M = 50''·11$ $w = 35·70$ $\frac{1}{w} = 0·03$ $C = 71° 46' 50''·11$
	50·36	49·36	49·51	50·09	50·22	50·60	50·09	50·67	49·98	50·21	

At XXXVII (Kaltigudda)

November 1872; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	0° 2′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XXXV (Halĕbail)										
	″	″	″	″	″	″	″	″	″	″	
XXXV (Halĕbail) and XXXVI (Hukaligudda)	l 59·98 l 61·36 l 60·61	l 60·38 l 61·45 l 60·74	l 61·17 l 58·36 l 61·26	l 60·15 l 60·00 l 58·75	h 61·05 h 59·82 h 59·40	h 59·86 h 61·94 h 61·52 h 60·09	l 60·16 l 62·26 l 60·80 l 62·13	l 59·31 l 59·20 l 59·61	l 59·22 l 61·35 l 59·56 l 59·36	l 60·61 l 60·62 l 59·58	$M = 60''·32$ $w = 17·74$ $\frac{1}{w} = 0·06$ $C = 72° 53' 0''·33$
	60·65	60·86	60·26	59·63	60·09	60·85	61·34	59·37	59·87	60·27	

* This value should be 47·18: the error was not detected until after completion of the calculations.

At XXXVII (Kaltigudda)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXV (Halĕbail)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 48′	
	″	″	″	″	″	″	″	″	″	″	
XXXVI (Hukaligudda) and XXXVIII (Dindĕmane)	l 17·61 l 17·26 l 17·60	l 19·54 l 18·65 l 17·96	l 18·74 l 16·33 l 17·17 l 15·97	l 17·66 l 17·21 l 19·20	h 17·44 h 18·48 h 18·54	h 16·34 h 16·71 h 18·18	h 18·33 h 17·77 h 17·41	h 17·97 h 17·00 l 17·56	l 18·37 l 17·83 l 17·66	l 18·51 l 18·36 l 17·83	M = 17″·80 w = 24·59 $\frac{1}{w}$ = 0·04 C = 38° 33′ 17″·79
	17·49	18·72	17·05	18·02	18·15	17·08	17·84	17·51	17·95	18·23	

At XXXVIII (Dindĕmane)

January 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXVII (Kaltigudda)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	173° 10′	353° 10′	252° 22′	72° 22′	331° 34′	151° 34′	50° 46′	230° 46′	129° 58′	309° 58′	
	″	″	″	″	″	″	″	″	″	″	
XXXVII (Kaltigudda) and XXXVI (Hukaligudda)	h 1·97 h 2·59 h 1·90	h 2·03 h 2·43 h 2·73	l 2·16 l 2·92 l 0·97	l 2·87 l 3·04 l 1·29	l 2·06 l 1·16 l 3·70 l 2·02	l 1·01 l 1·80 l 1·22	h 2·13 h 3·44 h 2·48	h 1·67 h 1·79 h 1·36	h 3·12 h 2·88 h 3·04	h 2·41 h 1·45 h 3·18 h 1·71	M = 2″·20 w = 29·14 $\frac{1}{w}$ = 0·03 C = 54° 8′ 2″·20
	2·15	2·40	2·02	2·40	2·24	1·34	2·68	1·61	3·01	2·19	
XXXVI (Hukaligudda) and XXXIX (Koramúr)	h 6·84 h 7·25 h 6·24	h 5·98 h 5·52 h 5·58	l 5·77 l 6·02 l 8·96 l 6·71	l 6·74 l 6·66 l 7·47	l 6·45 l 6·51 l 4·72	l 6·20 l 6·95 l 6·46	h 7·01 h 5·59 h 6·14	h 5·41 h 5·36 h 5·62	h 6·29 h 6·19 h 5·63	h 5·36 h 7·41 h 5·93 h 7·62	M = 6″·31 w = 23·76 $\frac{1}{w}$ = 0·04 C = 62° 41′ 6″·32
	6·78	5·69	6·87	6·96	5·89	6·54	6·25	5·46	6·04	6·58	
XXXIX (Koramúr) and XLII (Kŏdashádri)	h 56·98 h 55·65 h 55·90	h 56·21 h 55·75 h 56·29	l 57·80 l 57·40 l 55·26 l 58·09	l 57·41 l 56·30 l 55·43	l 56·77 l 57·09 l 57·43	l 57·45 l 56·81 l 56·02	h 55·45 h 56·09 h 56·39	h 56·43 h 57·33 h 58·43	h 56·53 h 56·25 h 56·29	h 58·36 h 57·44 h 57·30	M = 56″·71 w = 20·13 $\frac{1}{w}$ = 0·05 C = 56° 19′ 56″·71
	56·18	56·08	57·14	56·38	57·10	56·76	55·98	57·40	56·36	57·70	

At XXXIX (Koramúr)

January 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XL (Hŏnnavalli) 0° 1′	180° 1′	79° 13′	259° 13′	158° 30′	338° 30′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XL (Hŏnnavalli) and XLI (Hugadi)	h 17·64 h 17·96 l 16·33	h 17·71 h 18·02 h 17·30	l 18·63 l 18·13 l 17·09	l 17·09 l 16·47 l 16·87	h 18·49 h 17·34 h 15·63 h 16·21	h 17·55 h 18·34 h 16·82	h 16·82 h 16·74 l 16·09	l 16·47 l 15·85 l 16·42	l 18·42 l 17·69 l 16·86	l 16·94 l 16·51 l 16·31	M = 17″·13 w = 22·36 $\frac{1}{w}$ = 0·04 C = 81° 35′ 17″·13
	17·31	17·68	17·95	16·81	16·92	17·57	16·55	16·25	17·66	16·59	
XLI (Hugadi) and XLII (Kŏdashádri)	h 10·46 h 10·47 l 11·32	h 12·02 l 12·22 l 12·05	l 10·42 l 11·06 l 11·70	l 10·15 l 10·88 l 10·11	h 10·27 h 11·88 h 11·32	h 10·06 h 10·36 h 11·23	h 11·28 h 11·19 l 11·96	l 10·13 l 12·11 l 10·47	l 11·14 l 11·10 l 11·77	l 10·54 l 11·30 l 12·27	M = 11″·11 w = 29·40 $\frac{1}{w}$ = 0·03 C = 63° 11′ 11″·11
	10·75	12·10	11·06	10·38	11·16	10·55	11·48	10·90	11·34	11·37	
XLII (Kŏdashádri) and XXXVIII (Dindĕmane)	l 32·19 l 31·87 h 33·74	h 31·52 l 31·71 l 30·91	l 33·22 l 32·76 h 33·10	l 33·86 l 32·32 l 33·64	h 33·26 h 33·76 h 33·67	h 34·80 h 35·03 h 33·11	h 31·21 h 33·27 l 32·01 h 33·78	l 33·77 l 32·01 l 33·80	l 31·45 l 32·44 l 31·33	l 32·90 l 31·04 l 32·18	M = 32″·77 w = 10·45 $\frac{1}{w}$ = 0·10 C = 69° 17′ 32″·77
	32·60	31·38	33·03	33·27	33·56	34·31	32·57	33·19	31·74	32·04	
XXXVIII (Dindĕmane) and XXXVI (Hukaligudda)	l 58·48 l 57·35 h 56·71	h 59·35 h 59·21 l 59·26	l 55·20 l 57·93 h 57·13 h 58·73	l 57·24 h 58·85 h 57·49	h 57·46 h 57·96 h 57·08	h 58·80 h 58·85 h 59·15	h 60·33 h 58·80 l 59·28	l 58·32 l 59·09 l 58·65	l 57·36 h 58·52 h 57·64	l 58·68 l 57·43 h 58·19	M = 58″·24 w = 12·87 $\frac{1}{w}$ = 0·08 C = 34° 36′ 58″·23
	57·51	59·27	57·25	57·86	57·50	58·93	59·47	58·69	57·84	58·10	
XXXVI (Hukaligudda) and XXXIV (Chandragutti)	l 5·04 h 6·23 l 5·37	h 4·49 h 5·84 l 3·86	l 5·74 l 5·63 h 5·28	l 4·77 h 4·01 h 4·58	h 4·32 h 4·59 h 4·99	h 3·06 h 2·89 h 4·89	h 3·77 h 3·41 l 4·43	l 3·14 l 3·18 h 4·58	l 6·54 h 5·69 h 4·90	l 4·19 l 5·87 h 4·60	M = 4″·66 w = 13·50 $\frac{1}{w}$ = 0·07 C = 50° 48′ 4″·66
	5·55	4·73	5·55	4·45	4·63	3·61	3·87	3·63	5·71	4·89	
XXXIV (Chandragutti) and XL (Hŏnnavalli)	h 54·58 l 54·62 l 54·63	h 54·32 h 53·96 l 54·55	l 56·07 l 56·34 l 54·55	l 55·11 l 55·07 h 54·12	h 55·90 h 54·21 h 56·76	h 55·52 h 54·68 h 55·39	h 56·13 h 56·52 l 56·38	l 57·43 l 56·86 h 57·46	l 54·26 l 54·96 l 55·01	l 57·69 l 56·79 l 57·25	M = 55″·57 w = 8·10 $\frac{1}{w}$ = 0·12 C = 60° 30′ 55″·57
	54·61	54·28	55·65	54·77	55·62	55·20	56·34	57·25	54·74	57·24	

At XL (Hŏnnavalli)

December 1872 *and January* 1873 ; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLI (Hugadi)										M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	127° 17′	307° 16	206° 28′	26° 28′	285° 41′	105° 41′	4° 53′	184° 52′	84° 4′	264° 4′	
	″	″	″	″	″	″	″	″	″	″	
XLI (Hugadi) and XXXIX (Koramúr)	l 38·66	l 38·31	l 38·41	l 38·53	h 38·72	h 38·20	l 39·07	l 38·53	h 38·71	h 38·58	$M = 38''\cdot 28$
	l 37·66	l 37·35	l 38·85	l 38·55	h 37·62	l 37·94	l 38·06	l 37·50	h 37·93	h 39·39	$w = 50\cdot 56$
	l 38·17	l 37·09	l 37·53	l 38·25	h 39·00	l 38·30	l 37·74	l 37·53	h 38·36	h 38·50	$\frac{1}{w} = 0\cdot 02$
								l 39·86			
	38·16	37·58	38·26	38·44	38·45	38·15	38·29	38·36	38·33	38·82	$C = 57° \; 11' \; 38''\cdot 28$
XXXIX (Koramúr) and XXXIV (Chandragutti)	l 38·25	l 38·93	l 37·62	l 37·34	h 37·28	h 37·27	l 39·08	l 38·73	h 37·58	h 37·45	$M = 38''\cdot 05$
	l 37·25	l 39·33	l 37·63	l 38·55	h 36·72	h 37·32	l 38·61	l 37·97	h 36·89	h 37·71	$w = 20\cdot 08$
	l 38·68	l 38·31	l 38·10	l 38·15	h 36·64	h 37·47	l 39·51	l 39·47	h 37·59	h 38·39	$\frac{1}{w} = 0\cdot 05$
					l 38·95						
	38·06	38·86	37·78	38·01	37·40	37·35	39·07	38·72	37·35	37·85	$C = 70° \; 3' \; 38''\cdot 05$

At XLI (Hugadi)

January 1873 ; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIII (Siddeshvar)										M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	0° 1′	180° 1′	79° 13′	259° 13′	158° 26′	338° 25′	237° 38′	57° 37′	316° 49′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
XLIII (Siddeshvar) and XLIV (Bisale)	h 2·03	h 2·42	l 2·76	l 2·16	l 2·74	l 4·60	h 3·62	h 2·57	l 3·22	l 2·86	$M = 2''\cdot 89$
	h 2·77	h 3·18	l 1·60	l 2·59	l 3·37	l 2·98	h 4·19	h 1·98	l 4·10	l 2·92	$w = 34\cdot 50$
	h 2·73	h 2·48	l 2·71	l 2·85	l 2·55	l 3·27	h 3·02	h 2·93	l 2·96	l 2·49	$\frac{1}{w} = 0\cdot 03$
	2·51	2·69	2·36	2·53	2·89	3·62	3·61	2·49	3·43	2·76	$C = 33° \; 27' \; 2''\cdot 89$
XLIV (Bisale) and XLII (Kŏdashádri)	h 29·96	h 31·07	l 29·97	l 29·54	l 30·42	l 28·62	h 29·15	h 29·59	l 29·24	l 30·58	$M = 29''\cdot 65$
	h 29·21	h 29·93	l 30·04	l 30·15	l 29·97	l 28·70	h 28·75	h 29·21	l 29·07	l 29·21	$w = 26\cdot 30$
	l 30·97	h 29·45	l 29·99	l 29·31	l 30·86	l 29·03	h 29·11	h 28·89	l 29·16	l 30·37	$\frac{1}{w} = 0\cdot 04$
	30·05	30·15	30·00	29·67	30·42	28·78	29·00	29·23	29·16	30·05	$C = 56° \; 36' \; 29''\cdot 65$

At XLI (Hugadi)—(*Continued*).

Circle readings, telescope being set on XLIII (Siddeshvar)

Angle between	0° 1′	180° 1′	79° 18′	259° 18′	158° 26′	338° 25′	237° 38′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XLII (Kŏdashádri) and XXXIX (Koramúr)	h 24·58	h 24·02	l 26·82	l 26·04	l 24·45	l 25·54	h 26·06	h 25·59	l 25·15	l 25·35	M = 25″·45
	h 26·20	h 26·02	l 25·37	l 25·83	l 24·97	l 26·67	h 25·31	h 24·99	l 25·13	l 24·69	w = 35 ·70
	l 26·04	h 25·44	l 25·01	l 25·81	l 24·45	l 25·56	h 26·37	h 24·90	l 25·19	l 25·93	$\frac{1}{w}$ = 0 ·03
	25·61	25·16	25·73	25·89	24·62	25·92	25·91	25·16	25·16	25·32	C = 55° 31′ 25″·45
XXXIX (Koramúr) and XL (Hŏnnavalli)	h 7·16	h 6·24	l 6·47	l 8·28	l 6·26	l 6·06	h 6·72	h 7·17	l 7·05	l 7·55	M = 6″·71
	h 7·01	h 6·27	l 6·68	l 7·56	l 6·30	l 5·85	h 6·89	h 6·47	l 6·61	l 6·19	w = 41 ·70
	h 5·87	h 7·08	l 7·51	l 6·92	l 6·34	l 6·19	h 5·86	h 6·90	l 7·16	l 6·65	$\frac{1}{w}$ = 0 ·02
	6·68	6·53	6·89	7·59	6·30	6·03	6·49	6·85	6·94	6·80	C = 41° 13′ 6″·71

At XLII (Kŏdashádri)

January 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Circle readings, telescope being set on XXXVIII (Dindĕmane)

Angle between	0° 1′	180° 1′	79° 14′	259° 14′	158° 26′	338° 26′	237° 37′	57° 37′	316° 49′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXVIII (Dindĕmane) and XXXIX (Koramúr)	h 33·51	h 34·28	l 32·88	l 33·21	h 34·94	h 34·61	h 33·55	l 33·58	l 33·01	l 31·86	M = 33″·45
	h 33·36	h 33·50	l 33·15	l 34·29	h 32·21	h 34·48	h 33·96	l 33·82	l 33·52	l 33·67	w = 23 ·98
	h 33·36	h 34·42	l 32·62	l 32·83	h 32·83	h 34·42	h 32·16	l 34·22	l 32·55	l 32·66	$\frac{1}{w}$ = 0 ·04
					h 33·30						
	33·41	34·07	32·88	33·44	33·32	34·50	33·22	33·87	33·03	32·73	C = 54° 22′ 33″·45
XXXIX (Koramúr) and XLI (Hugadi)	h 26·48	h 26·94	l 26·68	l 27·19	h 26·06	h 26·43	l 26·30	l 26·50	l 27·02	l 28·22	M = 27″·12
	h 26·35	h 28·23	l 26·47	l 26·40	h 26·94	h 27·12	l 27·31	l 26·79	l 28·76	l 27·35	w = 24 ·34
	h 26·81	h 26·69	l 26·15	l 27·58	h 27·11	h 27·52	l 28·88	l 26·95	l 29·35	l 27·59	$\frac{1}{w}$ = 0 ·04
	h 26·55						l 28·38		l 26·81		
	26·55	27·29	26·43	27·06	26·70	27·02	27·72	26·75	27·99	27·72	C = 61° 17′ 27″·13
XLI (Hugadi) and XLIII (Siddeshvar)	h 12·40	h 10·71	l 13·35	l 12·02	h 12·74	h 10·54	l 13·63	l 11·18	l 10·92	l 10·91	M = 12″·08
	h 12·75	h 10·21	l 13·22	l 11·99	h 12·28	h 11·24	l 13·09	l 11·98	l 11·35	l 10·94	w = 11 ·95
	h 14·09	h 10·86	l 13·85	l 11·56	h 12·38	h 12·22	l 12·29	l 12·65	l 10·64	l 11·54	$\frac{1}{w}$ = 0 ·08
	h 12·49	h 13·10							l 12·95		
	12·93	11·22	13·47	11·86	12·47	11·33	13·00	11·94	11·47	11·13	C = 34° 6′ 12″·08

At XLII (Kŏdashádri)—(*Continued*).

Circle readings, telescope being set on XXXVIII (Dindĕmane)

M = Mean of Groups; w = Relative Weight; C = Concluded Angle

Angle between	0° 1′	180° 1′	79° 14′	259° 14′	158° 26′	338° 26′	237° 37′	57° 37′	316° 49′	136° 48′	
XLIII (Siddeshvar) and XLIV (Bisale)	″ h 12·76	″ h 12·98	″ l 12·21	″ l 13·10	″ h 12·81	″ h 13·81	″ l 12·00	″ l 13·24	″ l 14·01	″ l 13·76	M = 12″·80
	h 11·47	h 13·69	l 13·02	l 13·55	h 12·56	h 13·98	l 12·22	l 11·70	l 12·69	l 13·55	w = 16·51
	h 11·07	h 14·07	l 11·49	l 13·86	h 12·36	h 13·64	l 12·88	l 11·95	l 12·79	l 13·24	$\frac{1}{w}$ = 0·06
		h 10·32									
	11·77	12·77	12·24	13·50	12·58	13·81	12·37	12·30	13·16	13·52	C = 33° 40′ 12″·80

At XLIII (Siddeshvar)

January 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Circle readings, telescope being set on XLVI (Hĕbbe)

M = Mean of Groups; w = Relative Weight; C = Concluded Angle

Angle between	238° 44′	58° 44′	317° 57′	137° 57′	37° 9′	217° 8′	116° 21′	296° 21′	195° 32′	15° 32′	
XLVI (Hĕbbe) and XLV (Hirĕgudda)	″ h 30·18	″ h 29·42	″ l 32·53	″ l 31·09	″ h 31·81	″ h 30·43	″ h 31·30	″ l 29·78	″ h 32·08	″ h 29·08	M = 30″·60
	h 29·70	h 31·66	l 31·92	l 30·88	h 30·20	h 29·37	l 31·45	l 28·89	h 30·57	h 30·55	w = 14·30
	h 31·29	l 31·27	l 31·09	l 31·15	h 30·36	l 29·52	l 29·98	l 29·07	h 30·68	h 30·73	$\frac{1}{w}$ = 0·07
	30·39	30·78	31·85	31·04	30·79	29·77	30·91	29·25	31·11	30·12	C = 35° 32′ 30″·60
XLV (Hirĕgudda) and XLIV (Bisale)	h 22·42	h 22·36	l 19·95	l 21·25	h 22·32	h 19·69	h 20·17	l 21·71	h 19·14	h 22·19	M = 21″·32
	h 23·04	h 20·84	l 20·45	l 20·62	h 20·17	h 21·96	h 21·07	l 21·30	h 20·32	h 22·16	w = 13·60
	h 21·58	h 22·26	l 20·70	l 21·28	l 20·53	h 20·88	l 20·99	l 21·56	h 22·07	h 23·26	$\frac{1}{w}$ = 0·07
					l 22·63						
	22·35	21·82	20·37	21·05	21·41	20·84	20·74	21·52	20·51	22·54	C = 90° 30′ 21″·32
XLIV (Bisale) and XLII (Kŏdashádri)	h 55·04	h 55·76	l 56·25	l 54·86	h 56·11	h 57·07	h 57·66	l 56·60	h 55·41	h 55·08	M = 56″·41
	h 58·26	h 57·57	l 56·10	l 56·41	h 56·29	h 57·25	h 58·35	l 56·77	h 55·52	h 55·06	w = 14·94
	h 56·32	h 57·70	l 56·54	l 55·71	l 57·41	h 58·30	l 56·08	l 55·02	h 56·03	h 56·34	$\frac{1}{w}$ = 0·07
	h 57·66						l 55·45				
	56·82	57·01	56·30	55·66	56·60	57·54	56·89	56·13	55·65	55·49	C = 56° 49′ 56″·42
XLII (Kŏdashádri) and XLI (Hugadi)	h 17·64	h 15·91	h 17·13	h 16·34	h 16·78	h 15·45	h 15·67	h 15·90	h 18·21	h 18·49	M = 16″·86
	h 16·97	h 17·32	h 16·59	h 17·73	h 16·00	h 17·44	h 14·79	h 16·91	h 18·07	h 17·28	w = 13·50
	h 16·75	h 17·42	h 17·61	h 18·00	h 18·22	h 15·31	h 14·81	h 17·72	h 16·06	h 17·26	$\frac{1}{w}$ = 0·07
	17·12	16·88	17·11	17·36	17·00	16·07	15·09	16·84	17·45	17·68	C = 55° 50′ 16″·86

At XLIV (Bisale)

February 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLII (Kŏdashádri) 200° 51′	20° 50′	280° 3′	100° 3′	359° 15′	179° 15′	78° 26′	258° 26′	157° 39′	337° 39′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLII (Kŏdashádri) and XLI (Hugadi)	″ h 8·30 h 8·77 l 9·51	″ h 8·48 h 9·89 l 7·27	″ l 7·26 l 7·47 l 7·73	″ l 7·98 l 8·79 l 8·31	″ l 9·46 l 8·60 l 8·28	″ l 8·31 l 7·95 l 7·65	″ h 6·04 h 8·42 h 8·36	″ h 7·85 h 8·21 h 9·57 h 8·98	″ h 7·68 h 7·28 l 7·76 l 7·41	″ h 9·15 h 8·50 l 9·63	$M = 8''·29$ $w = 21·08$ $\frac{1}{w} = 0·05$ $C = 55° 37' 8''·29$
	8·86	8·55	7·49	8·36	8·78	7·97	7·61	8·65	7·53	9·09	
XLI (Hugadi) and XLIII (Siddeshvar)	h 44·76 h 44·47 l 43·26	h 45·71 l 46·94 l 44·40	l 44·57 l 44·71 l 45·11	l 45·45 l 43·42 l 43·41 l 43·96	l 45·54 l 44·29 h 44·18	l 45·12 l 44·35 l 45·76 h 46·04	h 44·91 h 45·33 h 44·43	h 45·09 h 44·69 h 44·91 h 44·22	h 45·29 h 46·21 l 44·73	h 43·27 h 45·98 l 46·00 l 45·65	$M = 44''·89$ $w = 22·78$ $\frac{1}{w} = 0·04$ $C = 33° 52' 44''·89$
	44·16	45·68	44·80	44·06	44·67	45·32	44·89	44·73	45·41	45·23	
XLIII (Siddeshvar) and XLV (Hirĕgudda)	h 38·09 h 36·58 h 34·84 l 36·91	h 39·72 l 37·17 l 37·80	l 38·08 l 38·55 l 37·74	l 36·20 l 37·66 l 37·50 l 37·39	l 36·19 l 37·76 h 37·84	l 37·59 l 36·77 l 37·58 h 37·46	h 37·80 h 35·52 h 38·25	h 36·57 h 37·65 h 37·69	h 37·87 h 37·77 l 38·02	h 36·98 h 36·96 l 38·33 l 35·86	$M = 37''·42$ $w = 22·30$ $\frac{1}{w} = 0·04$ $C = 56° 51' 37''·40$
	36·61	38·23	38·12	37·19	37·26	37·35	37·19	37·30	37·89	37·03	
XLV (Hirĕgudda) and XLVII (Valkunji)	h 19·47 h 21·10 l 20·73	h 19·70 l 18·76 l 20·28	l 19·85 l 18·03 l 19·41	l 21·14 l 20·91 l 21·64	l 19·99 l 20·44 l 21·19	l 18·68 l 20·75 l 19·76 h 20·06	h 20·70 h 21·15 h 20·54	h 20·61 h 20·72 h 20·67	h 19·11 l 20·54 l 20·06	h 21·84 h 20·60 l 21·01	$M = 20''·32$ $w = 16·78$ $\frac{1}{w} = 0·06$ $C = 54° 28' 20''·32$
	20·43	19·58	19·10	21·23	20·54	19·81	20·80	20·67	19·90	21·15	

At XLV (Hirĕgudda)

February 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLVI (Hĕbbe) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLVI (Hĕbbe) and VI (Ánúr)	″ h 44·97 h 44·74 l 46·56	″ l 45·08 l 46·46 l 44·54	″ l 45·95 l 44·06 l 45·68	″ l 44·42 l 45·29 l 45·29	″ h 46·19 h 45·70	″ l 46·44 l 46·24 h 46·85	″ l 45·35 l 44·11 l 45·19	″ l 44·83 l 45·31 l 45·87	″ l 44·88 l 46·32 h 45·17	″ h 43·62 h 44·15 h 44·87 h 45·40	$M = 45''·37$ $w = 22·56$ $\frac{1}{w} = 0·04$ $C = 56° 50' 45''·36$
	45·42	45·36	45·23	45·00	45·95	46·51	44·88	45·34	45·46	44·51	

NOTE.—Station VI (Ánúr) appertains to the Madras Longitudinal Series.

At XLV (Hirĕgudda)—(*Continued*).

Angle between	Circle readings, telescope being set on XLVI (Hĕbbe) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VI (Ánúr) and III (Kudurĕmukha)	h 51·14	l 51·53	l 50·96	l 50·38	h 50·57	l 49·80	l 50·25	l 49·93	l 48·97	h 51·09	M = 50″·54
	h 49·33	l 51·74	l 52·07	l 49·35	h 49·56	l 49·01	l 52·27	l 49·25	l 51·47	h 51·25	w = 13·00
	l 50·56	l 50·45	l 51·52	l 50·81	h 51·74	h 48·70	h 51·76	l 49·34	h 51·05	h 50·27	$\frac{1}{w}$ = 0·08
	50·34	51·24	51·52	50·18	50·62	49·17	51·43	49·51	50·50	50·87	C = 95° 39′ 50″·54
III (Kudurĕmukha) and XLVII (Valkunji)	h 53·44	l 54·70	l 53·77	l 52·76	h 52·73	h 55·30	l 55·87	l 53·82	l 55·10	h 55·33	M = 54″·15
	l 54·50	l 52·36	l 54·34	l 54·48	h 53·95	h 55·77	l 53·17	l 54·43	h 53·74	h 54·50	w = 14·84
	h 54·86	h 55·05	l 52·05	l 54·74	h 53·62	h 56·32	h 53·59	l 53·17	h 53·48	h 53·06	$\frac{1}{w}$ = 0·07
		h 54·69									
	54·27	54·20	53·39	53·99	53·43	55·80	54·21	53·81	54·11	54·30	C = 52° 38′ 54″·15
XLVII (Valkunji) and XLIV (Bisale)	h 4·33	l 2·59	l 3·00	l 2·55	h 3·19	h 1·43	l 2·47	l 2·03	h 1·20	h 2·20	M = 2″·47
	l 1·48	l 3·63	l 1·98	l 3·36	h 2·88	h 2·22	h 1·81	l 2·42	h 3·36	h 2·71	w = 27·80
	l 2·27	l 4·42	l 1·90	l 2·34	h 1·65	h 2·69	h 2·10	h 1·42	h 2·92	h 1·64	$\frac{1}{w}$ = 0·04
	2·69	3·55	2·29	2·75	2·57	2·11	2·13	1·96	2·49	2·18	C = 36° 25′ 2″·47
XLIV (Bisale) and XLIII (Siddeshvar)	h 3·92	l 3·17	l 2·05	l 1·93	h 3·98	h 4·64	l 3·38	l 5·07	h 3·17	h 4·41	M = 3″·43
	l 4·98	l 3·45	l 2·25	l 2·80	h 2·17	h 3·27	l 3·15	h 3·20	h 1·75	h 4·44	w = 11·68
	l 4·30	l 3·55	l 2·09	l 2·99	h 4·20	h 4·92	h 2·31	h 2·76	h 3·30	h 5·41	$\frac{1}{w}$ = 0·09
					h 3·06	h 4·47					
	4·40	3·39	2·13	2·57	3·35	4·33	2·95	3·68	2·74	4·75	C = 32° 38′ 3″·43
XLIII (Siddeshvar) and XLVI (Hĕbbe)	h 25·12	l 24·65	l 24·53	l 24·97	h 24·00	l 23·40	l 22·54	l 24·12	l 24·40	h 24·85	M = 24″·42
	h 23·19	l 25·90	l 25·08	l 24·24	l 25·82	l 25·71	l 23·61	l 23·76	h 23·79	h 25·22	w = 23·80
	l 23·02	l 22·79	l 24·62	l 24·56	l 24·79	h 23·02	h 25·54	h 25·83	h 24·44	h 25·00	$\frac{1}{w}$ = 0·04
	23·78	24·45	24·74	24·59	24·87	24·04	23·90	24·57	24·21	25·02	C = 85° 47′ 24″·42

At XLVI (Hĕbbe)

March 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VI (Ánúr) 0° 1′	180° 1′	79° 12′	259° 12′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VI (Ánúr) and XLV (Hirĕgudda)	l 19·10	l 17·77	l 17·17	l 17·21	h 17·58	h 18·70	h 18·39	h 18·35	h 19·96	l 18·39	M = 18″·01
	l 17·22	l 17·23	l 18·29	l 17·41	h 17·10	h 17·00	h 16·70	h 18·68	l 17·21	l 17·49	w = 16·70
	l 17·56	l 16·74	l 19·53	l 17·71	h 17·27	h 16·60	h 19·28	h 19·33	l 19·35	l 18·37	$\frac{1}{w}$ = 0·06
							h 19·40		l 19·60		
	17·96	17·25	18·33	17·44	17·32	17·43	18·44	18·79	19·03	18·08	C = 68° 50′ 18″·02

Note.—Stations III (Kudurĕmukha) and VI (Ánúr) appertain to the Madras Longitudinal Series.

At XLVI (Hĕbbe)—(*Continued*).

Angle between	Circle readings, telescope being set on VI (Ánúr) 0° 1′	180° 1′	79° 12′	259° 12′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLV (Hirĕgudda) and XLIII (Siddeshvar)	″ l 7·43 l 7·69 l 9·45	″ l 7·35 l 6·89 l 7·84	″ l 5·41 l 6·40 l 8·02	″ l 6·17 l 7·40 l 7·60	″ h 8·41 h 6·56 h 6·66	″ h 8·80 l 8·30 l 8·64	″ h 7·70 h 8·37 h 6·11 h 6·23	″ h 7·13 h 7·56 h 6·32	″ h 5·34 h 8·00 l 7·08	″ l 7·61 l 7·95 l 7·25	$M = 7''·35$ $w = 17·37$ $\frac{1}{w} = 0·06$ $C = 58° 40' 7''·35$
	8·19	7·36	6·61	7·06	7·21	8·58	7·10	7·00	6·81	7·60	

At XLVII (Valkunji).

February 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIV (Bisale) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLIV (Bisale) and XLV (Hirĕgudda)	″ h 40·77 h 40·36 h 39·79	″ h 41·00 h 41·50 h 39·67	″ l 42·12 l 40·49 h 41·29	″ l 40·37 l 39·67 l 41·49	″ l 40·30 l 41·94 h 40·18	″ l 39·50 l 41·38 l 39·19 l 41·57	″ l 41·34 l 41·88 l 41·22	″ l 39·48 l 40·39 l 40·47	″ l 42·13 l 40·85 l 41·36	″ l 39·44 l 39·92 l 41·04	$M = 40''·72$ $w = 22·42$ $\frac{1}{w} = 0·04$ $C = 89° 6' 40''·72$
	40·31	40·72	41·30	40·51	40·81	40·41	41·48	40·11	41·45	40·13	
XLV (Hirĕgudda) and III (Kudurĕmukha)	h 14·23 h 15·53 h 14·65	h 13·78 h 14·26 h 13·88	l 14·77 l 14·74 l 16·06	l 14·54 l 14·25 l 15·03	l 14·40 l 13·65 h 15·36	l 15·47 l 15·21 l 15·40	l 14·25 l 15·09 l 14·93	l 15·73 l 15·45 l 15·12	l 14·59 l 15·92 l 14·64	l 15·83 l 15·67 h 14·49	$M = 14''·90$ $w = 34·50$ $\frac{1}{w} = 0·03$ $C = 60° 18' 14''·90$
	14·80	13·97	15·19	14·61	14·47	15·36	14·76	15·43	15·05	15·33	

At III (Kudurĕmukha)

April 1872; *and February* 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLVII (Valkunji) 0° 2′	180° 2′	79° 14′	259° 14′	158° 26′	338° 26′	237° 39′	57° 39′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLVII (Valkunji) and XLV (Hirĕgudda)	″ l 53·40 l 53·34 l 53·23	″ l 51·52 l 52·41 l 52·27	″ l 52·21 l 51·85 h 51·57 h 51·81 h 51·13	″ l 51·66 l 52·67 h 52·08 h 53·32	″ h 53·25 h 53·38 h 54·24	″ l 53·98 h 53·88 h 53·95	″ h 53·85 h 53·56 h 53·82	″ h 53·56 h 52·56 h 54·58	″ h 53·98 h 54·08 h 52·10	″ h 53·11 h 52·71 h 53·72	$M = 53''·10$ $w = 15·05$ $\frac{1}{w} = 0·07$ $C = 67° 2' 53''·09$
	53·32	52·07	51·71	52·43	53·62	53·94	53·74	53·57	53·39	53·18	

Note.—Stations III (Kudurĕmukha) and VI (Ánúr) appertain to the Madras Longitudinal Series.

At III (Kudurĕmukha)—(*Continued*).

Angle between	Circle readings, telescope being set on XLVII (Valkunji)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2′	180° 2′	79° 14′	259° 14′	158° 26′	338° 26′	237° 39′	57° 39′	316° 49′	136° 49′	
XLV (Hirĕgudda) and VI (Ánúr)	″ h 53·71 h 54·31 l 53·96	″ l 54·28 l 56·24 l 55·19	″ h 54·80 h 55·37 h 54·87	″ l 54·84 l 53·96 l 55·04	″ h 55·10 h 54·33 h 54·49	″ h 54·89 h 54·79 h 52·74	″ h 54·02 h 54·80 h 54·23	″ h 53·89 h 54·18 h 52·63	″ h 54·67 h 54·50 h 55·35	″ h 54·13 h 53·60 h 54·16	$M = 54''\cdot 44$ $w = 26\cdot 30$ $\frac{1}{w} = 0\cdot 04$ $C = 38^\circ\ 1'\ 54''\cdot 44$
	53·99	55·24	55·01	54·61	54·64	54·14	54·35	53·57	54·84	53·96	

At VI (Ánúr)

***March* 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on III (Kudurĕmukha)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	359° 6′	179° 6′	78° 19′	258° 18′	157° 31′	337° 30′	236° 43′	56° 43′	315° 54′	135° 54′	
III (Kudurĕmukha) and XLV (Hirĕgudda)	″ h 18·09 h 18·27 h 16·11	″ l 19·67 h 17·11 h 15·93	″ h 17·62 h 16·70 h 17·19	″ h 17·57 h 18·03 h 18·76	″ h 16·06 h 16·49 h 16·10	″ h 19·82 h 18·97 h 18·45 l 17·37	″ h 17·23 h 16·69 h 15·33	″ h 17·20 h 17·79 h 17·31	″ h 17·36 h 16·73 h 17·53	″ h 17·12 h 16·81 h 18·21	$M = 17''\cdot 37$ $w = 14\cdot 41$ $\frac{1}{w} = 0\cdot 07$ $C = 46^\circ\ 18'\ 17''\cdot 38$
	17·49	17·57	17·17	18·12	16·22	18·65	16·42	17·43	17·21	17·38	
XLV (Hirĕgudda) and XLVI (Hĕbbe)	h 60·03 h 60·20 h 60·80	l 58·37 h 59·64 h 59·57	h 59·30 h 59·47 h 58·58	h 60·57 h 59·71 h 59·10	h 60·93 h 60·73 h 59·36	h 59·93 h 59·24 h 60·42	h 61·02 h 60·11 h 60·72	h 59·96 h 58·90 h 59·57	h 59·40 h 60·46 h 60·76	h 59·42 h 59·02 l 58·85	$M = 59''\cdot 81$ $w = 25\cdot 00$ $\frac{1}{w} = 0\cdot 04$ $C = 54^\circ\ 18'\ 59''\cdot 81$
	60·34	59·19	59·12	59·79	60·34	59·86	60·62	59·48	60·21	59·10	

Note.—Stations III (Kudurĕmukha) and VI (Ánúr) appertain to the Madras Longitudinal Series.

April 1882.

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In charge of Computing Office.

ADDENDUM.

The system of zero-setting adopted by the observer for the portion of the Series from its northern extremity down to Stations Navalúr and Kalkera, which was executed in 1863-66, differed from the system introduced in 1860 and explained at page 63 of Volume II of the *Account of the Operations of the Great Trigonometrical Survey of India*. The instrument employed having 5 microscopes, the zero-settings by the latter system should have been

$$\frac{0°\,0'}{180°\,0'},\ \frac{79°\,12'}{259°\,12'},\ \frac{158°\,24'}{338°\,24'},\ \frac{237°\,36'}{57°\,36'}\ \text{and}\ \frac{316°\,48'}{136°\,48'}.$$

but instead of these settings the following were actually adopted on the portion of the series above mentioned.

$$\frac{0°\,0'}{180°\,0'},\ \frac{43°\,12'}{223°\,12'},\ \frac{86°\,24'}{266°\,24'},\ \frac{129°\,36'}{309°\,36'}\ \text{and}\ \frac{172°\,48'}{352°\,48'}.$$

2. When the station of observation is at the centre of a polygon, a round of intersections is incomplete unless the first station in the round is intersected again at the end of the round. Thus, suppose at the central station S, the objects are successively A B C D E F, to measure all the six angles, a round should give the readings of A B C D E F A, and not only of A B C D E F: in the latter case only five of the six angles required are actually measured. Incomplete rounds were measured at the stations of Kalas, Páchvad, Dandoba Dongar, Karabgati and Chikk Nandihallígudd.

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April 1882.

In the calculations of the weights of the observed angles by the formula given in Section 4 of Chapter VII of Volume II and illustrated by an example in the foot note to page 342 of the same Volume, it is necessary to employ the squares of the *apparent* errors of observation and graduation. These data have been employed to 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 Barrow's 24-inch Theodolite No. 2, and Troughton and Simms' 24-inch Theodolite No. 1. The azimuthal circles of both 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.

The *e.m.s. of observation* of a single measure of an angle $= \sqrt{\dfrac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$

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

Group	Observer and Instrument	Position of stations	Interval between microscope readings of circle	Number of: Measures on each zero (average)	Number of: Angles	Number of: Single measures	Number of: Single zeros	*e. m. s.* of observation of a single measure	*e. m. s.* of graduation and observation of a single zero
I	Captain C. T. Haig, R.E., Barrow's 24-inch Theodolite No. 2.	Hills,	7° 12′	2·30	92	2114	920	$\left\{\frac{446\cdot56}{2114-920}\right\}^{\frac{1}{2}} = \pm\ 0''\cdot612$	$\left\{\frac{1031\cdot77}{920-92}\right\}^{\frac{1}{2}} = \pm\ 1''\cdot116$
II	Lieutenant H. Trotter, R.E., Barrow's 24-inch Theodolite No. 2.	"	7 12	3·31	38	1257	380	$\left\{\frac{1015\cdot62}{1257-380}\right\}^{\frac{1}{2}} = \pm\ 1\cdot076$	$\left\{\frac{271\cdot54}{380-38}\right\}^{\frac{1}{2}} = \pm\ 0\cdot891$
III	Lieutenant J. R. McCullagh, R.E., Troughton and Simms' 24-inch Theodolite No. 1.	"	7 12	3·11	53	1647	530	$\left\{\frac{663\cdot78}{1647-530}\right\}^{\frac{1}{2}} = \pm\ 0\cdot771$	$\left\{\frac{186\cdot76}{530-53}\right\}^{\frac{1}{2}} = \pm\ 0\cdot626$

April 1882.

J. B. N. HENNESSEY,
In charge of Computing Office.

MANGALORE MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION. REDUCTION OF FIGURES.

Figure No. 29.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	46	26	8·84	·38
2	77	21	38·82	·20
3	66	17	39·07	·38
4	54	48	59·51	·93
5	58	53	24·05	·04
6	94	56	57·05	·20
7	52	51	19·13	·16
8	32	11	49·52	·23
9	57	56	32·05	·24
10	50	53	21·67	·15
11	71	10	10·73	·12
12	84	36	35·03	·65
13	52	5	8·48	·30
14	43	18	22·66	·36

Equations to be satisfied

							Factor
x_3	$+x_4$	$+x_5$	...	...	...	$= e_1 = -\ 0{\cdot}525,$	λ_1
x_6	$+x_7$	$+x_8$	...	...	...	$= e_2 = +\ 0{\cdot}797,$	λ_2
x_9	$+x_{10}$	$+x_{11}$	...	...	...	$= e_3 = -\ 0{\cdot}665,$	λ_3
x_{12}	$+x_{13}$	$+x_{14}$	...	...	...	$= e_4 = +\ 0{\cdot}504,$	λ_4
$-x_1$	$-x_2$	$+x_3$	$+x_6$	$+x_9$	$+x_{12}$	$= e_5 = -\ 0{\cdot}421,$	λ_5
$4x_2$	$-20x_1$	$+12x_5$	$-15x_4$	$+34x_8$	...	$= e_6 = +35{\cdot}1,$	λ_6
$-16x_7$	$+\ 7x_{11}$	$-17x_{10}$	$+22x_{14}$	$-17x_{13}$			

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6
1	− 0·525	+1·35	...	...	...	+0·38	− 13·47
2	+ 0·797		+ 0·59	...	...	+0·20	+ 5·26
3	− 0·665			+0·51	...	+0·24	− 1·71
4	+ 0·504		*		+1·31	+0·65	+ 2·82
5	− 0·421					+2·05	+ 6·80
6	+35·1						+987·22

Values of the Factors

$\lambda_1 = +\ 0{\cdot}0490$

$\lambda_2 = +\ 1{\cdot}2567$

$\lambda_3 = -\ 0{\cdot}9676$

$\lambda_4 = +\ 0{\cdot}5705$

$\lambda_5 = -\ 0{\cdot}5031$

$\lambda_6 = +\ 0{\cdot}0297$

Angular errors in seconds

$x_1 =$	− 0·034	$x_8 =$	+ 0·521
$x_2 =$	+ 0·124	$x_9 =$	− 0·353
$x_3 =$	− 0·173	$x_{10} =$	− 0·221
$x_4 =$	− 0·368	$x_{11} =$	− 0·091
$x_5 =$	+ 0·016	$x_{12} =$	+ 0·044
$x_6 =$	+ 0·151	$x_{13} =$	+ 0·020
$x_7 =$	+ 0·125	$x_{14} =$	+ 0·440

$[wx^2] = 3{\cdot}16$

* In the tables of the equations between the factors the co-efficients of the terms below the diagonal are omitted for convenience, the co-efficient of the *p*th term in the *q*th line being always the same as the co-efficient of the *q*th term in the *p*th line.

Figure No. 30.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	74	50	3·70	·06
2	58	24	17·86	·26
3	46	45	42·41	·16
4	49	28	41·06	·12
5	48	57	31·61	·06
6	81	33	48·84	·13
7	64	49	26·65	·09
8	77	21	26·91	·10
9	37	49	9·91	·11
10	61	26	48·48	·15
11	45	52	49·51	·09
12	72	40	27·41	·10
13	56	37	57·72	·20
14	55	35	4·55	·04
15	41	38	0·04	·20
16	63	24	19·25	·14
17	74	57	44·41	·29

Equations to be satisfied — Factor

$$x_1 + x_2 + x_3 \;\ldots\;\ldots\;\ldots\;\ldots = e_1 = +0{\cdot}175, \quad \lambda_1$$
$$x_4 + x_5 + x_6 \;\ldots\;\ldots\;\ldots\;\ldots = e_2 = -1{\cdot}154, \quad \lambda_2$$
$$x_7 + x_8 + x_9 \;\ldots\;\ldots\;\ldots\;\ldots = e_3 = -0{\cdot}379, \quad \lambda_3$$
$$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots\;\ldots\;\ldots = e_4 = +0{\cdot}929, \quad \lambda_4$$
$$x_{15} + x_{16} + x_{17} \;\ldots\;\ldots\;\ldots\;\ldots = e_5 = +1{\cdot}287, \quad \lambda_5$$
$$x_1 + x_4 + x_7 + x_{10} - x_{13} - x_{14} + x_{15} = e_6 = +1{\cdot}247, \quad \lambda_6$$
$$\left.\begin{array}{l} 20x_3 - 13x_2 + 3x_6 - 18x_5 + 27x_9 - 5x_8 \\ +\,7x_{12} - 20x_{11} + 14x_{14} - 14x_{13} + 5x_{17} - 11x_{16} \end{array}\right\} \ldots = e_7 = -20{\cdot}3, \quad \lambda_7$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7
1	+ 0·175	+0·48	…	…	…	…	+0·06	− 0·18
2	− 1·154		+0·31	…	…	…	+0·12	− 0·69
3	− 0·379			+0·30	…	…	+0·09	+ 2·47
4	+ 0·929				+0·34	…	+0·15	− 1·10
5	+ 1·287			*		+0·63	+0·20	− 0·09
6	+ 1·247						+0·86	+ 2·24
7	−20·3							+323·37

Values of the Factors

$\lambda_1 = +0{\cdot}1221$
$\lambda_2 = -4{\cdot}5466$
$\lambda_3 = -1{\cdot}2171$
$\lambda_4 = +1{\cdot}7452$
$\lambda_5 = +1{\cdot}4828$
$\lambda_6 = +1{\cdot}7333$
$\lambda_7 = -0{\cdot}0688$

Angular errors in seconds

$x_1 = +0{\cdot}111$	$x_7 = +0{\cdot}046$	$x_{13} = -0{\cdot}154$
$x_2 = +0{\cdot}264$	$x_8 = -0{\cdot}087$	$x_{14} = -0{\cdot}108$
$x_3 = -0{\cdot}200$	$x_9 = -0{\cdot}338$	$x_{15} = +0{\cdot}643$
$x_4 = -0{\cdot}337$	$x_{10} = +0{\cdot}522$	$x_{16} = +0{\cdot}314$
$x_5 = -0{\cdot}199$	$x_{11} = +0{\cdot}281$	$x_{17} = +0{\cdot}330$
$x_6 = -0{\cdot}618$	$x_{12} = +0{\cdot}126$	

$[wx^2] = 12{\cdot}82$

Figure No. 31.

Observed Angles

No.	Value °	′	″	Reciprocal Weight	No.	Value °	′	″	Reciprocal Weight	No.	Value °	′	″	Reciprocal Weight
1	61	35	32·92	·19	9	37	2	31·21	·13	17	50	43	6·77	·12
2	43	7	49·32	·07	10	54	2	46·32	·27	18	72	34	50·02	·20
3	57	27	17·09	·17	11	50	47	28·68	·08	19	37	24	17·95	·16
4	50	44	24·84	·06	12	75	9	50·61	·05	20	28	32	16·10	·06
5	71	48	20·91	·11	13	46	55	19·18	·25	21	53	41	43·09	·03
6	40	41	44·79	·08	14	61	11	59·74	·11	22	60	21	47·69	·10
7	28	54	3·01	·20	15	71	52	43·16	·11					
8	73	21	44·18	·25	16	56	42	7·20	·12					

Equations to be satisfied — **Factor**

Equations to be satisfied	Factor
$x_3 + x_4 + x_5 \ldots = e_1 = -\ 0.416,$	λ_1
$x_6 + x_7 + x_8 + x_9 \ldots = e_2 = -\ 1{\cdot}504,$	λ_2
$x_{10} + x_{11} + x_{12} \ldots = e_3 = +\ 0{\cdot}442,$	λ_3
$x_{13} + x_{14} + x_{15} \ldots = e_4 = -\ 1{\cdot}367,$	λ_4
$x_{16} + x_{17} + x_{18} \ldots = e_5 = +\ 1{\cdot}040,$	λ_5
$x_{19} + x_{20} + x_{21} + x_{22} \ldots = e_6 = +\ 0{\cdot}769,$	λ_6
$x_6 + x_8 + x_{19} + x_{20} \ldots = e_7 = -\ 0{\cdot}998,$	λ_7
$-x_1 - x_2 + x_3 + x_6 + x_7 + x_{10} + x_{13} + x_{16} = e_8 = -\ 1{\cdot}087,$	λ_8
$\left.\begin{array}{l} 23x_2 - 11x_1 + 7x_5 - 17x_4 + 28x_9 - 6x_8 \\ + 6x_{12} - 17x_{11} + 7x_{15} - 12x_{14} + 7x_{18} - 17x_{17} \end{array}\right\} \ldots = e_9 = -\ 2{\cdot}7,$	λ_9
$8x_7 - 17x_6 + 36x_{20} - 28x_9 + 12x_{22} - 3x_{21} \ldots = e_{10} = +\ 11{\cdot}7,$	λ_{10}

Figure No. 31—(Continued).

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}
1	− 0·416	+0·34	...	...	...	...	...	...	+0·17	− 0·25	...
2	− 1·504		+0·66	...	...	...	...	+0·33	+0·28	+ 2·14	− 3·40
3	+ 0·442			+0·40	...	...	...	...	+0·27	− 1·06	...
4	− 1·367				+0·47	...	...	...	+0·25	− 0·55	...
5	+ 1·040					+0·44	...	...	+0·12	− 0·64	...
6	+ 0·769						+0·35	+0·22	...	...	+ 3·27
7	− 0·998				*			+0·55	+0·08	− 1·50	+ 0·80
8	− 1·087								+1·35	+ 0·48	+ 0·24
9	− 2·7									+284·30	−101·92
10	+11·7										+230·27

Values of the Factors

$\lambda_1 = -1·0947$
$\lambda_2 = -0·5437$
$\lambda_3 = +1·2366$
$\lambda_4 = -2·7814$
$\lambda_5 = +2·4070$
$\lambda_6 = +4·4301$
$\lambda_7 = -3·2583$
$\lambda_8 = -0·2951$
$\lambda_9 = -0·0255$
$\lambda_{10} = -0·0198$

Angular errors in seconds

$x_1 = +0·109$	$x_{12} = +0·054$
$x_2 = -0·020$	$x_{13} = -0·769$
$x_3 = -0·236$	$x_{14} = -0·272$
$x_4 = -0·040$	$x_{15} = -0·326$
$x_5 = -0·140$	$x_{16} = +0·253$
$x_6 = -0·301$	$x_{17} = +0·341$
$x_7 = -0·199$	$x_{18} = +0·446$
$x_8 = -0·912$	$x_{19} = +0·188$
$x_9 = -0·092$	$x_{20} = +0·027$
$x_{10} = +0·254$	$x_{21} = +0·135$
$x_{11} = +0·134$	$x_{22} = +0·419$

$[wx^2] = 14·94$

Figure No. 32.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	78	5	23·28	·08
2	49	36	4·03	·10
3	40	34	45·55	·07
4	62	9	29·71	·09
5	77	15	46·02	·08
6	66	9	10·10	·05
7	40	46	37·73	·11
8	73	4	14·56	·10
9	58	13	12·61	·06
10	71	34	38·19	·10
11	50	12	10·83	·12
12	57	7	41·31	·07
13	58	47	23·92	·13
14	64	4	56·38	·12
15	85	36	34·16	·08
16	49	18	51·55	·12
17	45	4	35·85	·22

Equations to be satisfied — **Factor**

$x_3 + x_4 + x_5 \;\ldots\;\ldots\;\ldots\;\ldots = e_1 = -1·303,$ λ_1

$x_6 + x_7 + x_8 \;\ldots\;\ldots\;\ldots\;\ldots = e_2 = +0·142,$ λ_2

$x_9 + x_{10} + x_{11} \;\ldots\;\ldots\;\ldots\;\ldots = e_3 = -0·131,$ λ_3

$x_{12} + x_{13} + x_{14} \;\ldots\;\ldots\;\ldots\;\ldots = e_4 = -0·433,$ λ_4

$x_{15} + x_{16} + x_{17} \;\ldots\;\ldots\;\ldots\;\ldots = e_5 = -0·910,$ λ_5

$-x_1 - x_2 + x_3 + x_6 + x_9 + x_{12} + x_{15} = e_6 = -0·882,$ λ_6

$\left.\begin{matrix} 18x_2 - 5x_1 + 5x_5 - 11x_4 + 7x_8 - 25x_7 \\ +17x_{11} - 7x_{10} + 10x_{14} - 13x_{13} + 21x_{17} - 18x_{16} \end{matrix}\right\} \;\ldots = e_7 = -5·5,$ λ_7

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7
1	−1·303	+0·24	…	…	…	…	+0·07	− 0·59
2	+0·142		+0·26	…	…	…	+0·05	− 2·05
3	−0·131			+0·28	…	…	+0·06	+ 1·34
4	−0·433				+0·32	…	+0·07	− 0·49
5	−0·910			*		+0·42	+0·08	+ 2·46
6	−0·882						+0·51	− 1·40
7	−5·5							+330·39

Values of the Factors

$\lambda_1 = -5·2892$

$\lambda_2 = +0·5710$

$\lambda_3 = -0·2941$

$\lambda_4 = -1·2448$

$\lambda_5 = -1·9949$

$\lambda_6 = -0·5705$

$\lambda_7 = -0·0108$

Angular errors in seconds

$x_1 = +0·050$	$x_7 = +0·092$	$x_{13} = -0·144$
$x_2 = +0·038$	$x_8 = +0·050$	$x_{14} = -0·162$
$x_3 = -0·410$	$x_9 = -0·052$	$x_{15} = -0·205$
$x_4 = -0·465$	$x_{10} = -0·022$	$x_{16} = -0·216$
$x_5 = -0·428$	$x_{11} = -0·057$	$x_{17} = -0·489$
$x_6 = 0·000$	$x_{12} = -0·127$	

$[wx^2] = 9·93$

Figure No. 33.

Observed Angles

No.	°	′	″	Reciprocal Weight
1	50	0	50·79	·11
2	61	4	1·00	·08
3	68	55	10·07	·05
4	46	52	44·30	·15
5	69	33	32·05	·07
6	63	33	45·78	·10
7	37	35	47·99	·11
8	66	11	35·59	·12
9	76	12	37·46	·10
10	90	35	34·63	·11
11	38	26	12·32	·04
12	50	58	15·27	·13
13	98	50	20·77	·09
14	47	34	18·94	·18
15	56	26	53·26	·07
16	73	49	13·51	·04
17	49	43	56·42	·05
18	44	52	46·77	·07
19	52	39	54·26	·07
20	82	27	21·30	·15

Equations to be satisfied

						Factor
x_1	$+x_2$	$+x_3$	...	...	$= e_1 = -0·329,$	λ_1
x_4	$+x_5$	$+x_6$	...	...	$= e_2 = +0·083,$	λ_2
x_7	$+x_8$	$+x_9$	...	...	$= e_3 = -0·647,$	λ_3
x_{10}	$+x_{11}$	$+x_{12}$	...	...	$= e_4 = +0·136,$	λ_4
x_{15}	$+x_{16}$	$+x_{17}$	...	...	$= e_5 = +0·055,$	λ_5
x_{18}	$+x_{19}$	$+x_{20}$	...	...	$= e_6 = -0·350,$	λ_6
x_1	$+x_4$	$+x_7$	$+x_{10}$	...	$= e_7 = -0·735,$	λ_7
$-x_{13}$	$-x_{14}$	$+x_{15}$	$+x_{18}$			
$9\,x_3$	$-11\,x_2$	$+10\,x_6$	$-8\,x_5$	$+5\,x_9$		
$-10\,x_8$	$+17\,x_{12}$	$-27\,x_{11}$	$+20\,x_{14}$	$+3\,x_{13}$	$= e_8 = +9·3,$	λ_8
$+18\,x_{17}$	$-6\,x_{16}$	$+3\,x_{20}$	$-16\,x_{19}$			

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	−0·329	+0·24	...	...	...	...	...	+0·11	− 0·43
2	+0·083		+0·32	...	...	...	...	+0·15	+ 0·44
3	−0·647			+0·33	...	...	...	+0·11	− 0·70
4	+0·136				+0·28	...	...	+0·11	+ 1·13
5	+0·055			*		+0·16	...	+0·07	+ 0·66
6	−0·350						+0·29	+0·07	− 0·67
7	−0·735							+0·89	− 3·87
8	+9·3								+219·16

Values of the Factors

$\lambda_1 = -1·1053$
$\lambda_2 = +0·4773$
$\lambda_3 = -1·7538$
$\lambda_4 = +0·6200$
$\lambda_5 = +0·4995$
$\lambda_6 = -1·0442$
$\lambda_7 = -0·5139$
$\lambda_8 = +0·0167$

Angular errors in seconds

$x_1 = -0·178$	$x_8 = -0·231$	$x_{15} = -0·001$
$x_2 = -0·103$	$x_9 = -0·167$	$x_{16} = +0·016$
$x_3 = -0·048$	$x_{10} = +0·012$	$x_{17} = +0·040$
$x_4 = -0·006$	$x_{11} = +0·007$	$x_{18} = -0·109$
$x_5 = +0·024$	$x_{12} = +0·117$	$x_{19} = -0·092$
$x_6 = +0·065$	$x_{13} = +0·051$	$x_{20} = -0·149$
$x_7 = -0·249$	$x_{14} = +0·153$	

$[wx^2] = 2·55$

Figure No. 34.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	49	8	37·28	·07
2	47	53	33·50	·12
3	82	57	49·72	·17
4	85	56	23·64	·13
5	62	4	7·84	·14
6	31	59	31·15	·12
7	52	13	41·24	·08
8	64	10	47·36	·15
9	63	35	32·94	·08
10	58	40	47·18	·08
11	54	3	39·48	·09
12	67	15	35·41	·08
13	62	37	49·65	·09
14	70	22	16·40	·13
15	46	59	55·93	·22
16	51	22	41·13	·13
17	44	35	51·65	·22
18	84	1	28·54	·05

Equations to be satisfied

Equation							Factor
x_1	$+x_2$	$+x_3$	...	...	...	$= e_1 = -0·412,$	λ_1
x_4	$+x_5$	$+x_6$	...	...	...	$= e_2 = +1·130,$	λ_2
x_7	$+x_8$	$+x_9$	...	...	...	$= e_3 = -0·452,$	λ_3
x_{10}	$+x_{11}$	$+x_{12}$	...	...	...	$= e_4 = +0·171,$	λ_4
x_{13}	$+x_{14}$	$+x_{15}$	...	...	...	$= e_5 = -0·252,$	λ_5
x_{16}	$+x_{17}$	$+x_{18}$	...	...	...	$= e_6 = -0·466,$	λ_6
x_1	$+x_4$	$+x_7$	$+x_{10}$	$+x_{13}$	$+x_{16}$	$= e_7 = +0·12,$	λ_7
$2x_3$	$-19x_2$	$+34x_6$	$-11x_5$	$+11x_9$	$-11x_8$	$= e_8 = -7·7,$	λ_8
$+9x_{12}$	$-15x_{11}$	$+20x_{15}$	$-8x_{14}$	$+2x_{18}$	$-21x_{17}$		

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·412	+0·36	...	...	...	...	...	+0·07	− 1·94
2	+ 1·130		+0·39	...	...	...	...	+0·13	+ 2·54
3	− 0·452			+0·31	...	...	...	+0·08	− 0·77
4	+ 0·171				+0·25	...	...	+0·08	− 0·63
5	− 0·252			*		+0·44	...	+0·09	+ 3·36
6	− 0·466						+0·40	+0·13	− 4·52
7	+ 0·12							+0·58	...
8	− 7·7								+447·76

Values of the Factors

$\lambda_1 = -1·5477$

$\lambda_2 = +3·2026$

$\lambda_3 = -1·6979$

$\lambda_4 = +0·4220$

$\lambda_5 = -0·1553$

$\lambda_6 = -1·9841$

$\lambda_7 = +0·3206$

$\lambda_8 = -0·0633$

Angular errors in seconds

$x_1 = -0·086$	$x_7 = -0·110$	$x_{13} = +0·015$
$x_2 = -0·041$	$x_8 = -0·150$	$x_{14} = +0·045$
$x_3 = -0·285$	$x_9 = -0·192$	$x_{15} = -0·312$
$x_4 = +0·458$	$x_{10} = +0·059$	$x_{16} = -0·216$
$x_5 = +0·546$	$x_{11} = +0·123$	$x_{17} = -0·144$
$x_6 = +0·126$	$x_{12} = -0·011$	$x_{18} = -0·106$

$[wx^2] = 6·59$

Figure No. 35.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	61	55	34·36	·05
2	59	13	23·27	·07
3	58	51	4·71	·06
4	61	29	28·92	·06
5	58	7	40·94	·09
6	60	22	51·02	·10
7	38	53	33·33	·16
8	43	35	14·96	·15
9	59	27	14·88	·12
10	38	4	0·71	·07
11	65	49	42·09	·13
12	54	2	7·35	·06
13	60	8	14·26	·09
14	88	16	25·86	·11
15	38	41	6·43	·08
16	53	2	29·76	·11
17	43	35	17·69	·09
18	38	3	57·21	·07
19	59	27	10·45	·09
20	38	53	37·08	·07

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots = e_1 = +0{\cdot}529,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots = e_2 = -0{\cdot}889,$	λ_2
$x_7 + x_8 + x_9 + x_{10} \ldots \ldots = e_3 = +1{\cdot}157,$	λ_3
$x_{11} + x_{12} + x_{13} \ldots \ldots \ldots = e_4 = +0{\cdot}434,$	λ_4
$x_{14} + x_{15} + x_{16} \ldots \ldots \ldots = e_5 = -0{\cdot}562,$	λ_5
$x_{17} + x_{18} + x_{19} + x_{20} \ldots \ldots = e_6 = +0{\cdot}210,$	λ_6
$x_7 + x_9 + x_{17} + x_{18} \ldots \ldots = e_7 = +1{\cdot}159,$	λ_7
$x_1 + x_4 + x_7 + x_8 + x_{11} + x_{14} = e_8 = -0{\cdot}48,$	λ_8
$\left.\begin{array}{l} 13x_3 - 12x_2 + 12x_6 - 13x_5 + 27x_{10} \\ -12x_9 + 12x_{13} - 15x_{12} + 15x_{16} - 26x_{15} \end{array}\right\} \ldots = e_9 = -16{\cdot}1,$	λ_9
$3x_8 - 23x_7 + 29x_{18} - 27x_{10} + 26x_{20} + 2x_{19} = e_{10} = -7{\cdot}6,$	λ_{10}

Equations between the Factors

No. of e	Value of e	λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}
1	+ 0·529	+0·18	...	...	...	...	...	...	+0·05	− 0·06	...
2	− 0·889		+0·25	...	...	...	...	...	+0·06	+ 0·03	...
3	+ 1·157			+0·50	...	...	...	+0·28	+0·31	+ 0·45	− 5·12
4	+ 0·434				+0·28	...	...	...	+0·13	+ 0·18	...
5	− 0·562					+0·30	...	...	+0·11	− 0·43	...
6	+ 0·210						+0·32	+0·16	...	...	+ 4·03
7	+ 1·159							+0·44	+0·16	− 1·44	− 1·65
8	− 0·48								+0·66	...	− 3·23
9	−16·1									+223·43	− 51·03
10	− 7·6										+243·57

Values of the Factors

$\lambda_1 = +3{\cdot}8372$
$\lambda_2 = -2{\cdot}7484$
$\lambda_3 = +3{\cdot}7376$
$\lambda_4 = +3{\cdot}1441$
$\lambda_5 = -0{\cdot}7643$
$\lambda_6 = +0{\cdot}2238$
$\lambda_7 = +1{\cdot}0967$
$\lambda_8 = -3{\cdot}3264$
$\lambda_9 = -0{\cdot}0772$
$\lambda_{10} = -0{\cdot}0092$

Angular errors in seconds

$x_1 = +0{\cdot}026$	$x_8 = +0{\cdot}058$	$x_{15} = +0{\cdot}100$
$x_2 = +0{\cdot}333$	$x_9 = +0{\cdot}691$	$x_{16} = -0{\cdot}212$
$x_3 = +0{\cdot}170$	$x_{10} = +0{\cdot}133$	$x_{17} = +0{\cdot}119$
$x_4 = -0{\cdot}365$	$x_{11} = -0{\cdot}024$	$x_{18} = +0{\cdot}074$
$x_5 = -0{\cdot}157$	$x_{12} = +0{\cdot}258$	$x_{19} = +0{\cdot}018$
$x_6 = -0{\cdot}367$	$x_{13} = +0{\cdot}200$	$x_{20} = -0{\cdot}001$
$x_7 = +0{\cdot}275$	$x_{14} = -0{\cdot}450$	

$[wx^2] = 14{\cdot}82$

Figure No. 36.

Observed Angles

No.	Value	Reciprocal Weight	No.	Value	Reciprocal Weight	No.	Value	Reciprocal Weight
	° ′ ″			° ′ ″			° ′ ″	
1	71 46 50·11	·03	10	82 41 57·34	·02	19	63 11 11·11	·03
2	51 30 46·83	·06	11	62 41 6·32	·04	20	61 17 27·13	·04
3	56 42 25·58	·04	12	34 36 58·23	·08	21	55 31 25·45	·03
4	43 44 47·58	·04	13	74 27 44·78	·04	22	81 35 17·13	·04
5	63 22 13·93	·09	14	50 48 4·66	·07	23	41 13 6·71	·02
6	72 53 0·33	·06	15	54 44 11·14	·03	24	57 11 38·28	·02
7	87 18 39·87	·08	16	69 17 32·77	·10	25	60 30 55·57	·12
8	38 33 17·79	·04	17	56 19 56·71	·05	26	70 3 38·05	·05
9	54 8 2·20	·03	18	54 22 33·45	·04	27	49 25 28·93	·03

Equations to be satisfied — **Factor**

$$x_1 + x_2 + x_3 \; \ldots \; \ldots \; \ldots = e_1 = +\,0·826, \qquad \lambda_1$$

$$x_4 + x_5 + x_6 \; \ldots \; \ldots \; \ldots = e_2 = +\,0·760, \qquad \lambda_2$$

$$x_7 + x_8 + x_9 \; \ldots \; \ldots \; \ldots = e_3 = -\,1·262, \qquad \lambda_3$$

$$x_{10} + x_{11} + x_{12} \; \ldots \; \ldots \; \ldots = e_4 = +\,0·550, \qquad \lambda_4$$

$$x_{13} + x_{14} + x_{15} \; \ldots \; \ldots \; \ldots = e_5 = -\,1·353, \qquad \lambda_5$$

$$x_{16} + x_{17} + x_{18} \; \ldots \; \ldots \; \ldots = e_6 = +\,0·407, \qquad \lambda_6$$

$$x_{19} + x_{20} + x_{21} \; \ldots \; \ldots \; \ldots = e_7 = +\,1·068, \qquad \lambda_7$$

$$x_{22} + x_{23} + x_{24} \; \ldots \; \ldots \; \ldots = e_8 = -\,0·304, \qquad \lambda_8$$

$$x_{25} + x_{26} + x_{27} \; \ldots \; \ldots \; \ldots = e_9 = +\,0·480, \qquad \lambda_9$$

$$x_1 + x_4 + x_7 + x_{10} + x_{13} \; \ldots = e_{10} = -\,0·32, \qquad \lambda_{10}$$

$$x_{12} + x_{14} + x_{16} + x_{19} + x_{22} + x_{25} = e_{11} = -\,0·53, \qquad \lambda_{11}$$

$$\left.\begin{array}{l} 13\,x_3 - 17\,x_2 + 7\,x_6 - 11\,x_5 + 15\,x_9 - 27\,x_8 \\ +30\,x_{12} - 11\,x_{11} + 14\,x_{15} - 17\,x_{14} \end{array}\right\} = e_{12} = -\,53·1, \qquad \lambda_{12}$$

$$\left.\begin{array}{l} 11\,x_{11} - 2\,x_{10} + 15\,x_{18} - 14\,x_{17} + 15\,x_{21} - 11\,x_{20} \\ +14\,x_{24} - 24\,x_{23} + 18\,x_{27} - 8\,x_{26} + 6\,x_{13} - 14\,x_{15} \end{array}\right\} = e_{13} = +\,45·8, \qquad \lambda_{13}$$

Figure No. 36—(Continued).

Equations between the Factors

No. of e	Value of e	Co-efficients of												
		λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}	λ_{11}	λ_{12}	λ_{13}
1	+ 0·826	+0·13	...	...	...	...	...	...	...	...	+0·03	...	− 0·50	...
2	+ 0·760		+0·19	...	...	...	...	...	...	...	+0·04	...	− 0·57	...
3	− 1·262			+0·15	...	...	...	...	...	...	+0·08	...	− 0·63	...
4	+ 0·550				+0·14	...	...	...	...	...	+0·02	+0·08	+ 1·96	+ 0·40
5	− 1·353					+0·14	...	...	...	...	+0·04	+0·07	− 0·77	− 0·18
6	+ 0·407						+0·19	...	...	...	...	+0·10	...	− 0·10
7	+ 1·068							+0·10	...	...	...	+0·03	...	+ 0·01
8	− 0·304								+0·08	...	...	+0·04	...	− 0·20
9	+ 0·480									+0·20	...	+0·12	...	+ 0·14
10	− 0·32										+0·21	...	...	+ 0·20
11	− 0·53											+0·44	+ 1·21	...
12	−53·1												+176·79	−10·72
13	+45·8													+70·99

Values of the Factors	Angular errors in seconds		
$\lambda_1 = + 4·0957$			
$\lambda_2 = + 2·1593$	$x_1 = + 0·201$	$x_{10} = + 0·226$	$x_{19} = + 0·266$
$\lambda_3 = -11·6108$	$x_2 = + 0·685$	$x_{11} = + 0·788$	$x_{20} = + 0·243$
$\lambda_4 = + 9·6460$	$x_3 = - 0·060$	$x_{12} = - 0·464$	$x_{21} = + 0·559$
$\lambda_5 = -10·9007$	$x_4 = + 0·190$	$x_{13} = - 0·216$	$x_{22} = - 0·154$
$\lambda_6 = + 3·7186$	$x_5 = + 0·621$	$x_{14} = - 0·426$	$x_{23} = - 0·259$
$\lambda_7 = +11·3851$	$x_6 = - 0·051$	$x_{15} = - 0·711$	$x_{24} = + 0·109$
$\lambda_8 = - 1·3351$	$x_7 = - 0·721$	$x_{16} = + 0·121$	$x_{25} = + 0·127$
$\lambda_9 = + 3·5686$	$x_8 = + 0·001$	$x_{17} = - 0·153$	$x_{26} = - 0·015$
$\lambda_{10} = + 2·6004$	$x_9 = - 0·542$	$x_{18} = + 0·439$	$x_{27} = + 0·368$
$\lambda_{11} = - 2·5118$			
$\lambda_{12} = - 0·4311$		$[wx^2] = 101·03$	
$\lambda_{13} = + 0·4836$			

Figure No. 37.

Observed Angles

No.	Value			Reciprocal Weight
	°	′	″	
1	34	6	12·08	·08
2	56	36	29·65	·04
3	33	27	2·89	·03
4	55	50	16·86	·07
5	56	49	56·42	·07
6	33	52	44·89	·04
7	55	37	8·29	·05
8	33	40	12·80	·06

Equations to be satisfied — **Factor**

$$-x_1 - x_2 + x_5 + x_6 = e_1 = +0{\cdot}417, \quad \lambda_1$$

$$-x_3 - x_4 + x_7 + x_8 = e_2 = +0{\cdot}502, \quad \lambda_2$$

$$\left.\begin{array}{l} x_1 + x_2 + x_3 + x_4 \\ +x_5 + x_6 + x_7 + x_8 \end{array}\right\} = e_3 = -0{\cdot}507, \quad \lambda_3$$

$$\left.\begin{array}{l} 1{\cdot}477\,x_1 - 0{\cdot}659\,x_2 + 1{\cdot}514\,x_3 - 0{\cdot}679\,x_4 \\ +0{\cdot}654\,x_5 - 1{\cdot}489\,x_6 + 0{\cdot}684\,x_7 - 1{\cdot}501\,x_8 \end{array}\right\} = e_4 = -1{\cdot}397, \quad \lambda_4$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	+0·417	+0·23	...	−0·01	−0·1056
2	+0·502		+0·21	+0·01	−0·0538
3	−0·507		*	+0·44	+0·0200
4	−1·397				+0·5703

Values of the Factors

$\lambda_1 = +0{\cdot}8102$

$\lambda_2 = +1{\cdot}9087$

$\lambda_3 = -1{\cdot}0826$

$\lambda_4 = -2{\cdot}0817$

Angular errors in seconds

x_1 =	−0·397	x_5 =	−0·114
x_2 =	−0·021	x_6 =	+0·113
x_3 =	−0·184	x_7 =	−0·030
x_4 =	−0·111	x_8 =	+0·237

$[wx^2] = 4{\cdot}74$

Figure No. 38.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	32	38	3·43	·09
2	90	30	21·32	·07
3	56	51	37·40	·04
4	36	25	2·47	·04
5	54	28	20·32	·06
6	89	6	40·72	·04
7	52	38	54·15	·07
8	60	18	14·90	·03
9	67	2	53·09	·07
10	95	39	50·54	·08
11	38	1	54·44	·04
12	46	18	17·38	·07
13	56	50	45·36	·04
14	54	18	59·81	·04
15	68	50	18·02	·06
16	85	47	24·42	·04
17	58	40	7·35	·06
18	35	32	30·60	·07

Equations to be satisfied

Equation		Factor
$x_1 + x_2 + x_3$ … … …	$= e_1 = -0·106,$	λ_1
$x_4 + x_5 + x_6$ … … …	$= e_2 = +1·095,$	λ_2
$x_7 + x_8 + x_9$ … … …	$= e_3 = -0·342,$	λ_3
$x_{10} + x_{11} + x_{12}$ … … …	$= e_4 = -0·138,$	λ_4
$x_{13} + x_{14} + x_{15}$ … … …	$= e_5 = +1·630,$	λ_5
$x_{16} + x_{17} + x_{18}$ … … …	$= e_6 = -0·008,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16}$	$= e_7 = +0·37,$	λ_7
$\left.\begin{matrix} 14x_3 + 0x_2 + 0x_6 - 15x_5 + 9x_9 - 12x_8 \\ +20x_{12} - 27x_{11} + 9x_{15} - 16x_{14} + 30x_{18} - 13x_{17} \end{matrix}\right\}$	$= e_8 = +8·3,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·106	+0·20	…	…	…	…	…	+0·09	+ 0·56
2	+ 1·095		+0·14	…	…	…	…	+0·04	− 0·90
3	− 0·342			+0·17	…	…	…	+0·07	+ 0·27
4	− 0·138				+0·19	…	…	+0·08	+ 0·32
5	+ 1·630			*		+0·14	…	+0·04	− 0·10
6	− 0·008						+0·17	+0·04	+ 1·32
7	+ 0·37							+0·36	…
8	+ 8·3								+176·73

Values of the Factors

$\lambda_1 = -\ 0·6330$

$\lambda_2 = +\ 8·6592$

$\lambda_3 = -\ 1·9988$

$\lambda_4 = -\ 0·7197$

$\lambda_5 = +\ 11·8518$

$\lambda_6 = -\ 0·7944$

$\lambda_7 = -\ 0·4561$

$\lambda_8 = +\ 0·1101$

Angular errors in seconds

$x_1 = -0·098$	$x_7 = -0·172$	$x_{13} = +0·456$
$x_2 = -0·044$	$x_8 = -0·100$	$x_{14} = +0·404$
$x_3 = +0·036$	$x_9 = -0·070$	$x_{15} = +0·770$
$x_4 = +0·328$	$x_{10} = -0·094$	$x_{16} = -0·050$
$x_5 = +0·421$	$x_{11} = -0·148$	$x_{17} = -0·134$
$x_6 = +0·346$	$x_{12} = +0·104$	$x_{18} = +0·176$

$[wx^2] = 30·41$

April, 1887.

W. H. COLE,
In charge of Computing Office.

MANGALORE MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION. TRIANGLES.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ′ "			
15		XIX (Alsunda)	1·347	− ·124	− ·016		− ·140	77 21 37·333	5·2207263,3	166236·49	31·484
		XVII (Kem)	1·346	+ ·034	− ·119		− ·085	46 26 7·409	5·0914777,2	123446·20	23·380
		I (Kalas)	1·346		+ ·135			56 12 15·258	5·1509951,9	141577·81	26·814
			4·039					180 0 0·000			
16		I (Kalas)	1·052	+ ·173	+ ·047		+ ·220	66 17 38·238	5·1206308,7	132017·32	25·003
		XIX (Alsunda)	1·051	+ ·368	− ·056		+ ·312	54 48 58·771	5·0713018,9	117842·49	22·319
		XXII (Bori)	1·052	− ·016	+ ·009		− ·007	58 53 22·991	5·0914777,2	123446·20	23·380
			3·155				+ ·525	180 0 0·000			
45		XVII (Kem)	1·888	− ·440	− ·166		− ·606	43 18 20·166	5·1599447,6	144525·59	27·372
		I (Kalas)	1·889	− ·044	+ ·128		+ ·084	84 36 33·225	5·3217655,4	209780·70	39·731
		II (Sulki)	1·889	− ·020	+ ·038		+ ·018	52 5 6·609	5.2207263,3	166236·49	31·484
			5·666				− ·504	180 0 0·000			
46		I (Kalas)	1·705	+ ·353	+ ·019		+ ·372	57 56 30·717	5·1982699,1	157859·20	29·898
		II (Sulki)	1·705	+ ·091	− ·116		− ·025	71 10 9·000	5·2462345,8	176292·80	33·389
		III (Palvan)	1·705	+ ·221	+ ·097		+ ·318	50 53 20·283	5·1599447,6	144525·59	27·372
			5·115				+ ·665	180 0 0·000			
	335	XXII (Bori)	1·634	− ·125		+ ·151	+ ·026	52 51 17·522	5·2462345,8	176292·80	33·389
		I (Kalas)	1·635	− ·151		− ·329	− ·480	94 56 54·935	5·3430952,5	220340·98	41·731
		III (Palvan)	1·634	− ·521		+ ·178	− ·343	32 11 47·543	5·0713018,9	117842·49	22·319
			4·903				− ·797	180 0 0·000			

Notes.—1. The values of the sides are given in the same lines with the opposite angles.
2. Stations XVII (Kem), XIX (Alsunda) and XXII (Bori) appertain to the Bombay Longitudinal Series.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
47		II (Sulki)	1·265	− ·264	− ·039		− ·303	58 24 16·292	5·1439868,0	139311·44	26·385
		III (Palvan)	1·265	+ ·200	+ ·042		+ ·242	46 45 41·387	5·0760998,9	119151·61	22·567
		IV (Páchvad)	1·265	− ·111	− ·003		− ·114	74 50 2·321	5·1982699,1	157859·20	29·898
			3·795				− ·175	180 0 0·000			
48		III (Palvan)	·888	+ ·199	+ ·011		+ ·210	48 57 30·932	5·0262187,0	106223·03	20·118
		IV (Páchvad)	·888	+ ·337	− ·041		+ ·296	49 28 40·468	5·0296143,6	107056·83	20·276
		VI (Aundh)	·888	+ ·618	+ ·030		+ ·648	81 33 48·600	5·1439868,0	139311·44	26·385
			2·664				+1·154	180 0 0·000			
49		VI (Aundh)	1·283	+ ·087	+ ·012		+ ·099	77 21 25·726	5·2279769,5	169035·12	32·014
		IV (Páchvad)	1·283	− ·046	− ·050		− ·096	64 49 25·271	5·1952868,6	156778·61	29·693
		VIII (Kundal)	1·283	+ ·338	+ ·038		+ ·376	37 49 9·003	5·0262187,0	106223·03	20·118
			3·849				+ ·379	180 0 0·000			
50		IV (Páchvad)	1·490	− ·522	− ·013		− ·535	61 26 46·455	5·1918212,1	155532·51	29·457
		VIII (Kundal)	1·490	− ·281	+ ·028		− ·253	45 52 47·767	5·1041976,2	127115·24	24·075
		VII (Palsi)	1·491	− ·126	− ·015		− ·141	72 40 25·778	5·2279769,5	169035·12	32·014
			4·471				− ·929	180 0 0·000			
	336	II (Sulki)	·805	− ·330		− ·052	− ·382	74 57 43·223	5·1095348,5	128687·05	24·373
		IV (Páchvad)	·804	− ·643		+ ·050	− ·593	41 37 58·643	4·9470693,8	88525·71	16·766
		V (Katphal)	·804	− ·314		+ ·002	− ·312	63 24 18·134	5·0760998,9	119151·61	22·567
			2·413				−1·287	180 0 0·000			
	337	IV (Páchvad)	1·196			+ ·057		67 46 59·916	5·1542642,1	142647·51	27·017
		V (Katphal)	1·195	+ ·108		− ·075	+ ·033	55 35 3·388	5·1041976,2	127115·24	24·075
		VII (Palsi)	1·196	+ ·154		+ ·018	+ ·172	56 37 56·696	5·1095348,5	128687·05	24·373
			3·587					180 0 0·000			
51		VII (Palsi)	1·188	− ·109	− ·010		− ·119	61 35 31·613	5·1505954,7	141447·56	26·789
		VIII (Kundal)	1·187	+ ·020	+ ·022		+ ·042	43 7 48·175	5·0411566,0	109940·23	20·822
		IX (Dandoba Dongar)	1·188		− ·012			75 16 40·212	5·1918212,1	155532·51	29·457
			3·563					180 0 0·000			
52		VIII (Kundal)	1·085	+ ·040	+ ·028		+ ·068	50 44 23·823	5·0617697,9	115284·20	21·834
		IX (Dandoba Dongar)	1·085	+ ·236	− ·036		+ ·200	57 27 16·205	5·0986800,8	125510·51	23·771
		XII (Majala)	1·086	+ ·140	+ ·008		+ ·148	71 48 19·972	5·1505954,7	141447·56	26·789
			3·256				+ ·416	180 0 0·000			
53		IX (Dandoba Dongar)	1·565	+ ·500	+ ·005		+ ·505	69 35 46·740	5·2537487,0	179369·55	33·972
		XII (Majala)	1·565	+ ·912	+ ·026		+ ·938	73 21 43·553	5·2633148,0	183364·30	34·728
		XIII (Mávinhúnda)	1·564	+ ·092	− ·031		+ ·061	37 2 29·707	5·0617697,9	115284·20	21·834
			4·694				+1·504	180 0 0·000			
54		XII (Majala)	1·353	− ·188	+ ·057		− ·131	37 24 16·466	5·0412545,6	109965·03	20·827
		XIII (Mávinhúnda)	1·354	− ·419	− ·046		− ·465	60 21 45·871	5·1968582,5	157346·94	29·801
		XIV (Hatarvat)	1·354	− ·162	− ·011		− ·173	82 13 57·663	5·2537487,0	179369·55	33·972
			4·061				− ·769	180 0 0·000			
	338	VII (Palsi)	·984	− ·446		+ ·011	− ·435	72 34 48·601	5·1320032,1	135519·94	25·667
		IX (Dandoba Dongar)	·983	− ·253		+ ·015	− ·238	56 42 5·979	5·0745070,6	118715·40	22·484
		X (Daphlápur)	·983	− ·341		− ·026	− ·367	50 43 5·420	5·0411566,0	109940·23	20·822
			2·950				−1·040	180 0 0·000			
	339	X (Daphlápur)	1·149	+ ·326		+ ·008	+ ·334	71 52 42·345	5·1672542,4	146978·66	27·837
		IX (Dandoba Dongar)	1·149	+ ·769		+ ·013	+ ·782	46 55 18·813	5·0529230,3	112959·57	21·394
		XI (Athni)	1·149	+ ·272		− ·021	+ ·251	61 11 58·842	5·1320032,1	135519·94	25·667
			3·447				+1·367	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			″	″	″	″	″	° ′ ″			
	340	IX (Dandoba Dongar)	1·723	− ·254		+ ·015	− ·239	54 2 44·358	5·1862495,3	153549·90	29·081
		XI (Athni)	1·723	− ·054		+ ·012	− ·042	75 9 48·845	5·2633148,0	183364·30	34·728
		XIII (Mávinhúnda)	1·722	− ·134		− ·027	− ·161	50 47 26·797	5·1672542,4	146978·66	27·837
			5·168				− ·442	180 0 0·000			
	341	IX (Dandoba Dongar)	1·339	+ ·301		− ·044	+ ·257	40 41 43·708	5·1968582,5	157346·94	29·801
		XII (Majala)	1·340	+ ·724		+ ·083	+ ·807	110 46 1·597	5·3534102,0	225636·94	42·734
		XIV (Hatarvat)	1·339	− ·027		− ·039	− ·066	28 32 14·695	5·0617697,9	115284·20	21·834
			4·018				+ ·998	180 0 0·000			
55		XIII (Mávinhúnda)	·900	− ·050	+ ·007		− ·043	78 5 22·337	5·1334472,5	135971·30	25·752
		XIV (Hatarvat)	·899	− ·038	+ ·020		− ·018	49 36 3·113	5·0245964,8	105827·00	20·043
		XV (Karabgati)	·899		− ·027			52 18 34·550	5·0412545,6	109965·03	20·827
			2·698					180 0 0·000			
56		XIV (Hatarvat)	·861	+ ·465	+ ·028		+ ·493	62 9 29·342	5·0908386,4	123264·67	23·346
		XV (Karabgati)	·861	+ ·410	− ·022		+ ·388	40 34 45·077	4·9575146,5	90680·66	17·174
		XVII (Karigudd)	·861	+ ·428	− ·006		+ ·422	77 15 45·581	5·1334472,5	135971·30	25·752
			2·583				+1·303	180 0 0·000			
57		XVII (Karigudd)	·749	− ·092	+ ·051		− ·041	40 46 36·940	4·9250694,7	84152·98	15·938
		XV (Karabgati)	·749	·000	− ·032		− ·032	66 9 9·319	5·0713226,1	117848·11	22·320
		XIX (Kolanhatti)	·750	− ·050	− ·019		− ·069	73 4 13·741	5·0908386,4	123264·67	23·346
			2·248				− ·142	180 0 0·000			
58		XV (Karabgati)	·587	+ ·052	+ ·029		+ ·081	58 13 12·104	4·9689881,8	93108·25	17·634
		XIX (Kolanhatti)	·587	+ ·022	+ ·019		+ ·041	71 34 37·644	5·0166816,9	103915·83	19·681
		XVIII (Kathárigad)	·587	+ ·057	− ·048		+ ·009	50 12 10·252	4·9250694,7	84152·98	15·938
			1·761				+ ·131	180 0 0·000			
	342	XIII (Mávinhúnda)	·823	+ ·489		+ ·039	+ ·528	45 4 35·555	4·9948225,6	98814·92	18·715
		XV (Karabgati)	·824	+ ·205		+ ·023	+ ·228	85 36 33·564	5·1434817,5	139149·54	26·354
		XVI (Manikeri)	·823	+ ·216		− ·062	+ ·154	49 18 50·881	5·0245964,8	105827·00	20·043
			2·470				+ ·910	180 0 0·000			
	343	XV (Karabgati)	·681	+ ·127		+ ·029	+ ·156	57 7 40·785	4·9869381,2	97037·16	18·378
		XVI (Manikeri)	·681	+ ·162		+ ·013	+ ·175	64 4 55·874	5·0166816,9	103915·83	19·681
		XVIII (Kathárigad)	·681	+ ·144		− ·042	+ ·102	58 47 23·341	4·9948225,6	98814·92	18·715
			2·043				+ ·433	180 0 0·000			
59		XVIII (Kathárigad)	·730	+ ·103	+ ·018		+ ·121	61 4 0·391	5·0267449,5	106351·83	20·142
		XIX (Kolanhatti)	·730	+ ·048	+ ·011		+ ·059	68 55 9·399	5·0545618,8	113386·63	21·475
		XX (Chikk Nandihallígudd)	·729	+ ·178	− ·029		+ ·149	50 0 50·210	4·9689881,8	93108·25	17·634
			2·189				+ ·329	180 0 0·000			
60		XIX (Kolanhatti)	·683	− ·024	+ ·024		·000	69 33 31·367	5·0464716,2	111293·97	21·078
		XX (Chikk Nandihallígudd)	·682	+ ·006	− ·009		− ·003	46 52 43·615	4·9379866,6	86693·53	16·419
		XXII (Yalúr)	·682	− ·065	− ·015		− ·080	63 33 45·018	5·0267449,5	106351·83	20·142
			2·047				− ·083	180 0 0·000			
61		XXII (Yálur)	·562	+ ·231	+ ·004		+ ·235	66 11 35·263	5·0205521,6	104846·08	19·857
		XX (Chikk Nandihallígudd)	·562	+ ·249	+ ·023		+ ·272	37 35 47·700	4·8445727,6	69915·38	13·242
		XXIII (Samshergad)	·563	+ ·167	− ·027		+ ·140	76 12 37·037	5·0464716,2	111293·97	21·078
			1·687				+ ·647	180 0 0·000			
62		XXIII (Samshergad)	·694	− ·007	+ ·029		+ ·022	38 26 11·648	4·9237740,8	83902·15	15·891
		XX (Chikk Nandihallígudd)	·695	− ·012	− ·002		− ·014	90 35 33·921	5·1302064,3	134960·41	25·561
		XXV (Kalkera)	·695	− ·117	− ·027		− ·144	50 58 14·431	5·0205521,6	104846·08	19·857
			2·084				− ·136	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			″	″	″	″	″	° ′ ″			
63		XX (Chikk Nandihallígudd)	·411		+ ·028			33 35 21·346	4·7985553,9	62886·20	11·910
		XXV (Kalkera)	·412	− ·051	− ·005		− ·056	98 50 20·302	5·0504568,9	112319·95	21·273
		XXIV (Navalúr)	·412	− ·153	− ·023		− ·176	47 34 18·352	4·9237740,8	83902·15	15·891
			1·235					180 0 0·000			
	344	XVIII (Kathárigad)	·894	+ ·149		+ ·037	+ ·186	82 27 20·592	5·1503636,1	141372·06	26·775
		XX (Chikk Nandihallígudd)	·893	+ ·109		+ ·014	+ ·123	44 52 46·000	5·0027086,3	100625·63	19·058
		XXI (Hirĕkummígudd)	·893	+ ·092		− ·051	+ ·041	52 39 53·408	5·0545618,8	113386·63	21·475
			2·680				+ ·350	180 0 0·000			
	345	XX (Chikk Nandihallígudd)	1·045	+ ·001		− ·025	− ·024	56 26 52·191	5·0887598,4	122676·06	23·234
		XXI (Hirĕkummígudd)	1·045	− ·040		+ ·067	+ ·027	49 43 55·402	5·0504568,9	112319·95	21·273
		XXIV (Navalúr)	1·045	− ·016		− ·042	− ·058	73 49 12·407	5·1503636,1	141372·06	26·775
			3·135				− ·055	180 0 0·000			
64		XXV (Kalkera)	·304	+ ·285	+ ·007		+ ·292	82 57 49·708	4·9165485,4	82517·97	15·628
		XXIV (Navalúr)	·304	+ ·041	+ ·006		+ ·047	47 53 33·243	4·7901704,6	61683·71	11·683
		XXVI (Ganigudd)	·304	+ ·086	− ·013		+ ·073	49 8 37·049	4·7985553,9	62886·20	11·910
			·912				+ ·412	180 0 0·000			
65		XXIV (Navalúr)	·596	+ ·106	+ ·014		+ ·120	84 1 28·064	5·0677693,7	116887·84	22·138
		XXVI (Ganigudd)	·595	+ ·216	+ ·003		+ ·219	51 22 40·754	4·9629426,4	91821·14	17·390
		XXVII (Kundgol)	·595	+ ·144	− ·017		+ ·127	44 35 51·182	4·9165485,4	82517·97	15·628
			1·786				+ ·466	180 0 0·000			
66		XXVII (Kundgol)	·744	+ ·312	+ ·022		+ ·334	46 59 55·520	4·9578889,3	90758·84	17·189
		XXVI (Ganigudd)	·744	− ·015	− ·008		− ·023	62 37 48·883	5·0422117,6	110207·65	20·873
		XXIX (Indúr)	·744	− ·045	− ·014		− ·059	70 22 15·597	5·0677693,7	116887·84	22·138
			2·232				+ ·252	180 0 0·000			
67		XXVI (Ganigudd)	·633	− ·059	+ ·015		− ·044	58 40 46·503	4·9811941,2	95762·20	18·137
		XXIX (Indúr)	·633	+ ·011	+ ·003		+ ·014	67 15 34·791	5·0144533,8	103384·02	19·580
		XXX (Rámankŏp)	·633	− ·123	− ·018		− ·141	54 3 38·706	4·9578889,3	90758·84	17·189
			1·899				− ·171	180 0 0·000			
	346	XXV (Kalkera)	·500	− ·546		+ ·020	− ·526	62 4 6·814	5·0122710,4	102865·82	19·482
		XXVI (Ganigudd)	·500	− ·458		+ ·005	− ·453	85 56 22·687	5·0649687,0	116136·50	21·996
		XXVIII (Kánsĕrudi)	·500	− ·126		− ·025	− ·151	31 59 30·499	4·7901704,6	61683·71	11·683
			1·500				−1·130	180 0 0·000			
	347	XXVI (Ganigudd)	·664	+ ·110		− ·002	+ ·108	52 13 40·684	4·9580082,0	90783·77	17·194
		XXVIII (Kánsĕrudi)	·664	+ ·150		+ ·012	+ ·162	64 10 46·858	5·0144533,8	103384·02	19·580
		XXX (Rámankŏp)	·664	+ ·192		− ·010	+ ·182	63 35 32·458	5·0122710,4	102865·82	19·482
			1·992				+ ·452	180 0 0·000			
68		XXIX (Indúr)	·604	− ·333	+ ·016		− ·317	59 13 22·349	4·9696339,8	93246·80	17·660
		XXX (Rámankŏp)	·603	− ·170	− ·005		− ·175	58 51 3·932	4·9679431,7	92884·48	17·592
		XXXI (Bhedasgávegudda)	·604	− ·026	− ·011		− ·037	61 55 33·719	4·9811941,2	95762·20	18·137
			1·811				− ·529	180 0 0·000			
69		XXX (Rámankŏp)	·589	+ ·157	+ ·014		+ ·171	58 7 40·522	4·9594746,3	91090·82	17·252
		XXXI (Bhedasgávegudda)	·590	+ ·365	+ ·006		+ ·371	61 29 28·701	4·9743124,9	94256·76	17·852
		XXXIII (Menshigudda)	·590	+ ·367	− ·020		+ ·347	60 22 50·777	4·9696339,8	93246·80	17·660
			1·769				+ ·889	180 0 0·000			
70		XXXI (Bhedasgávegudda)	·908	− ·333	+ ·021		− ·312	82 28 47·070	5·1657359,1	146465·69	27·740
		XXXIII (Menshigudda)	·908	− ·691	+ ·003		− ·688	59 27 13·284	5·1046010,3	127233·37	24·097
		XXXIV (Chandragutti)	·907	− ·133	− ·024		− ·157	38 3 59·646	4·9594746,3	91090·82	17·252
			2·723				−1·157	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			"	"	"	"	"	° ′ "			
71		XXXIII (Menshigudda)	·740	− ·119	+ ·018		− ·101	43 35 16·849	5·0080000,4	101859·14	19·291
		XXXIV (Chandragutti)	·740	+ ·001	− ·006		− ·005	38 53 36·335	4·9673582,4	92759·47	17·568
		XXXV (Halĕbail)	·740	− ·092	− ·012		− ·104	97 31 6·816	5·1657359,1	146465·69	27·740
			2·220				− ·210	180 0 0·000			
	348	XXIX (Indúr)	·871	+ ·212		+ ·026	+ ·238	53 2 29·127	5·0746230,3	118747·11	22·490
		XXXI (Bhedasgávegudda)	·871	+ ·450		− ·006	+ ·444	88 16 25·433	5·1718408,7	148539·13	28·132
		XXXII (Karĕkyatanhalli)	·870	− ·100		− ·020	− ·120	38 41 5·440	4·9679431,7	92884·48	17·592
			2·612				+ ·562	180 0 0·000			
	349	XXXI (Bhedasgávegudda)	1·089	+ ·024		− ·010	+ ·014	65 49 41·015	5·1266202,6	133850·57	25·350
		XXXII (Karĕkyatanhalli)	1·089	− ·200		+ ·021	− ·179	60 8 12·992	5·1046010,3	127233·37	24·097
		XXXIV (Chandragutti)	1·088	− ·258		− ·011	− ·269	54 2 5·993	5·0746230,3	118747·11	22·490
			3·266				− ·434	180 0 0·000			
	350	XXXI (Bhedasgávegudda)	·650	− ·275		+ ·003	− ·272	38 53 32·408	4·9673582,4	92759·47	17·568
		XXXIII (Menshigudda)	·651	− ·810		+ ·021	− ·789	103 2 31·130	5·1581465,1	143928·41	27·259
		XXXV (Halĕbail)	·650	− ·074		− ·024	− ·098	38 3 56·462	4·9594746,3	91090·82	17·252
			1·951				−1·159	180 0 0·000			
72		XXXV (Halĕbail)	·565	+ ·060	+ ·027		+ ·087	56 42 25·102	4·9524791,5	89635·32	16·976
		XXXIV (Chandragutti)	·564	− ·685	+ ·007		− ·678	51 30 45·588	4·9239589,2	83938·06	15·897
		XXXVI (Hukaligudda)	·565	− ·201	− ·034		− ·235	71 46 49·310	5·0080000,4	101859·14	19·291
			1·694				− ·826	180 0 0·000			
73		XXXIV (Chandragutti)	·644	+ ·711	+ ·058		+ ·769	54 44 11·265	4·9751598,7	94440·84	17·887
		XXXVI (Hukaligudda)	·645	+ ·216	− ·015		+ ·201	74 27 44·336	5·0470321,7	111437·71	21·106
		XXXIX (Koramúr)	·644	+ ·426	− ·043		+ ·383	50 48 4·399	4·9524791,5	89635·32	16·976
			1·933				+1·353	180 0 0·000			
74		XXXVI (Hukaligudda)	·447	− ·226	+ ·009		− ·217	82 41 56·676	5·0229694,6	105431·28	19·968
		XXXIX (Koramúr)	·446	+ ·464	+ ·028		+ ·492	34 36 58·276	4·7809115,8	60382·57	11·436
		XXXVIII (Dindĕmane)	·447	− ·788	− ·037		− ·825	62 41 5·048	4·9751598,7	94440·84	17·887
			1·340				− ·550	180 0 0·000			
75		XXXVIII (Dindĕmane)	·841	+ ·153	+ ·043		+ ·196	56 19 56·065	5·0332198,9	107949·33	20·445
		XXXIX (Koramúr)	·841	− ·121	+ ·017		− ·104	69 17 31·825	5·0839529,6	121325·74	22·978
		XLII (Kŏdashádri)	·841	− ·439	− ·060		− ·499	54 22 32·110	5·0229694,6	105431·28	19·968
			2·523				− ·407	180 0 0·000			
76		XXXIX (Koramúr)	·874	− ·266	+ ·057		− ·209	63 11 10·027	5·0677015,6	116869·61	22·134
		XLII (Kŏdashádri)	·874	− ·243	− ·015		− ·258	61 17 25·998	5·0601375,3	114851·73	21·752
		XLI (Hugadi)	·874	− ·559	− ·042		− ·601	55 31 23·975	5·0332198,9	107949·33	20·445
			2·622				−1·068	180 0 0·000			
	351	XXXV (Halĕbail)	·360	− ·621		+ ·016	− ·605	63 22 12·965	4·8949334,0	78511·53	14·870
		XXXVI (Hukaligudda)	·360	− ·190		+ ·025	− ·165	43 44 47·055	4·7834058,5	60730·36	11·502
		XXXVII (Kaltigudda)	·360	+ ·051		− ·041	+ ·010	72 52 59·980	4·9239589,2	83938·06	15·897
			1·080				− ·760	180 0 0·000			
	352	XXXVI (Hukaligudda)	·374	+ ·721		+ ·015	+ ·736	87 18 40·232	4·9857613,9	96774·60	18·329
		XXXVII (Kaltigudda)	·374	− ·001		+ ·069	+ ·068	38 33 17·484	4·7809115,8	60382·57	11·436
		XXXVIII (Dindĕmane)	·374	+ ·542		− ·084	+ ·458	54 8 2·284	4·8949334,0	78511·53	14·870
			1·122				+1·262	180 0 0·000			
	353	XXXIV (Chandragutti)	·690	− ·368		+ ·064	− ·304	49 25 27·936	4·9544356,7	90040·04	17·053
		XXXIX (Koramúr)	·690	− ·127		− ·041	− ·168	60 30 54·712	5·0136420,4	103191·05	19·544
		XL (Hŏnnavalli)	·690	+ ·015		− ·023	− ·008	70 3 37·352	5·0470321,7	111437·71	21·106
			2·070				− ·480	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Circuit	Non-circuit	Total	Corrected Plane Angle	Distance: Log. feet	Feet	Miles
			"	"	"	"	"	° ′ "			
	354	XXXIX (Koramúr)	·808	+ ·154		− ·018	+ ·136	81 35 16·458	5·1308983,6	135175·63	25·601
		XL (Hŏnnavalli)	·808	− ·109		+ ·074	− ·035	57 11 37·437	5·0601375,3	114851·73	21·752
		XLI (Hugadi)	·808	+ ·259		− ·056	+ ·203	41 13 6·105	4·9544356,7	90040·04	17·053
			2·424				+ ·304	180 0 0·000			
77		XLI (Hugadi)	·731	+ ·205	+ ·036		+ ·241	90 3 32·050	5·1499587,7	141240·35	26·750
		XLII (Kŏdashádri)	·731	+ ·397	− ·006		+ ·391	34 6 11·740	4·8986787,6	79191·54	14·998
		XLIII (Siddeshvar)	·731	+ ·111	− ·030		+ ·081	55 50 16·210	5·0677015,6	116869·61	22·134
			2·193				+ ·713	180 0 0·000			
78		XLII (Kŏdashádri)	·731	− ·237	+ ·104		− ·133	33 40 11·936	4·8938053,7	78307·87	14·831
		XLIII (Siddeshvar)	·731	+ ·114	− ·036		+ ·078	56 49 55·767	5·0727380,4	118232·82	22·393
		XLIV (Bisale)	·732	− ·083	− ·068		− ·151	89 29 52·297	5·1499587,7	141240·35	26·750
			2·194				− ·206	180 0 0·000			
	355	XLI (Hugadi)	1·010	+ ·021		− ·020	+ ·001	56 36 28·641	5·0727380,4	118232·82	22·393
		XLII (Kŏdashádri)	1·011	+ ·160		+ ·098	+ ·258	67 46 24·127	5·1175587,5	131086·73	24·827
		XLIV (Bisale)	1·010	+ ·030		− ·078	− ·048	55 37 7·232	5·0677015,6	116869·61	22·134
			3·031				+ ·211	180 0 0·000			
79		XLIII (Siddeshvar)	·752	+ ·044	+ ·088		+ ·132	90 30 20·700	5·1619809,2	145204·79	27·501
		XLIV (Bisale)	·752	− ·036	+ ·037		+ ·001	56 51 36·649	5·0848991,3	121590·34	23·028
		XLV (Hirĕgudda)	·752	+ ·098	− ·125		− ·027	32 38 2·651	4·8938053,7	78307·87	14·831
			2·256				+ ·106	180 0 0·000			
80		XLIV (Bisale)	·805	− ·421	+ ·059		− ·362	54 28 19·153	5·0725677,5	118186·47	22·384
		XLV (Hirĕgudda)	·805	− ·328	− ·009		− ·337	36 25 1·328	4·9355696,7	86212·39	16·328
		XLVII (Valkunji)	·805	− ·346	− ·050		− ·396	89 6 39·519	5·1619809,2	145204·79	27·501
			2·415				− 1·095	180 0 0·000			
81		XLVII (Valkunji)	·827	+ ·100	+ ·065		+ ·165	60 18 14·238	5·0472406,2	111491·21	21·116
		XLV (Hirĕgudda)	·827	+ ·172	+ ·019		+ ·191	52 38 53·514	5·0087142,5	102026·80	19·323
		III (Kudurĕmukha)	·828	+ ·070	− ·084		− ·014	67 2 52·248	5·0725677,5	118186·47	22·384
			2·482				+ ·342	180 0 0·000			
82		XLV (Hirĕgudda)	·833	+ ·094	+ ·057		+ ·151	95 39 49·858	5·1859637,2	153448·88	29·062
		III (Kudurĕmukha)	·832	+ ·148	+ ·022		+ ·170	38 1 53·778	4·9777374,9	95003·04	17·993
		VI (Ánúr)	·833	− ·104	− ·079		− ·183	46 18 16·364	5·0472406,2	111491·21	21·116
			2·498				+ ·138	180 0 0·000			
	356	XLIII (Siddeshvar)	·792	− ·176		+ ·066	− ·110	35 32 29·698	4·9177488,3	82746·35	15·672
		XLV (Hirĕgudda)	·793	+ ·050		+ ·015	+ ·065	85 47 23·692	5·1521797,8	141964·50	26·887
		XLVI (Hĕbbe)	·793	+ ·134		− ·081	+ ·053	58 40 6·610	5·0848991,3	121590·34	23·028
			2·378				+ ·008	180 0 0·000			
	357	XLV (Hirĕgudda)	·520	− ·456		+ ·043	− ·413	56 50 44·427	4·9308886,9	85288·15	16·153
		XLVI (Hĕbbe)	·520	− ·770		+ ·018	− ·752	68 50 16·748	4·9777374,9	95003·04	17·993
		VI (Ánúr)	·520	− ·404		− ·061	− ·465	54 18 58·825	4·9177488,3	82746·35	15·672
			1·560				− 1·630	180 0 0·000			

NOTE.—Stations III (Kudurĕmukha) and VI (Ánúr) appertain to the Madras Longitudinal Series.

May, 1887.

W. H. COLE,

In charge of Computing Office.

MANGALORE MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	XVII (Kem)	18 10 48·90	75 20 51·10	133 23 30·68	5·1509951,9	313 17 54·83	XIX (Alsunda)
	" "	"	"	86 57 21·92	5·2207263,3	266 48 25·10	I (Kalas)
	" "	"	"	43 38 59·87	5·3217655,4	223 31 17·53	II (Sulki)
8	XIX (Alsunda)	18 26 52·37	75 3 2·29	85 28 33·33	5·1206308,7	265 21 21·08	XXII (Bori)
"	" "	"	"	30 39 33·51	5·0914777,2	210 36 8·49	I (Kalas)
	XXII (Bori)	18 25 7·76	74 40 15·27	324 14 45·12	5·0713018,9	144 18 29·20	" "
	" "	"	"	17 6 4·28	5·3430952,5	197 2 35·55	III (Palvan)
23	I (Kalas)	18 9 19·24	74 52 9·41	351 25 0·21	5·1599447,6	171 26 9·03	II (Sulki)
"	" "	"	"	49 21 32·63	5·2462345,8	229 14 24·73	III (Palvan)
	II (Sulki)	17 45 42·31	74 55 52·63	100 15 58·33	5·1982699,1	280 7 46·72	" "
	" "	"	"	41 51 40·77	5·0760998,9	221 47 31·76	IV (Páchvad)
	" "	"	"	326 53 56·74	4·9470693,8	146 56 28·34	V (Katphal)
24	III (Palvan)	17 50 19·43	74 29 4·48	326 53 29·37	5·1439868,0	146 57 28·18	IV (Páchvad)
"	" "	"	"	15 51 1·19	5·0296143,6	195 49 29·31	VI (Aundh)
	IV (Páchvad)	17 31 1·97	74 42 10·89	263 25 31·21	5·1095348,5	83 32 9·41	V (Katphal)
	" "	"	"	97 28 46·82	5·0262187,0	277 23 18·80	VI (Aundh)
	" "	"	"	331 12 32·32	5·1041976,2	151 15 40·83	VII (Palsi)
	" "	"	"	32 39 20·27	5·2279769,5	212 34 40·22	VIII (Kundal)
	V (Katphal)	17 33 26·85	75 4 12·37	27 57 4·82	5·1542642,1	207 53 38·72	VII (Palsi)
25	VI (Aundh)	17 33 18·25	74 24 2·23	354 44 45·81	5·1952868,6	174 45 29·93	VIII (Kundal)

NOTE.—Stations XVII (Kem), XIX (Alsunda) and XXII (Bori) appertain to the Bombay Longitudinal Series.

Station A				Side A B			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	VII (Palsi)	17 12 37·11	74 52 42·53	78 35 13·56	5·1918212,1	258 27 29·48	VIII (Kundal)
	„ „	„	„	16 59 40·76	5·0411566,0	196 58 3·61	IX (Dandoba Dongar)
	„ „	„	„	304 24 51·17	5·0745070,6	124 29 48·29	X (Daphlápur)
26	VIII (Kundal)	17 7 30·24	74 26 30·28	301 35 18·84	5·1505954,7	121 41 22·21	IX (Dandoba Dongar)
„	„ „	„	„	352 19 43·75	5·0986800,8	172 20 34·04	XII (Majala)
	IX (Dandoba Dongar)	16 55 14·50	74 47 11·51	253 40 10·57	5·1320032,1	73 46 41·89	X (Daphlápur)
	„ „	„	„	300 35 30·54	5·1672542,4	120 41 47·22	XI (Athni)
	„ „	„	„	64 14 4·92	5·0617697,9	244 8 55·10	XII (Majala)
	„ „	„	„	354 38 16·62	5·2633148,0	174 39 7·12	XIII (Mávinhúnda)
	„ „	„	„	23 32 19·87	5·3534102,0	203 27 54·90	XIV (Hatarvat)
	X (Daphlápur)	17 1 31·12	75 9 31·99	1 53 58·40	5·0529230,3	181 53 47·21	XI (Athni)
	XI (Athni)	16 42 51·64	75 8 53·45	45 31 56·66	5·1862495,3	225 26 35·64	XIII (Mávinhúnda)
27	XII (Majala)	16 46 56·82	74 29 22·75	317 30 40·21	5·2537487,0	137 36 35·85	„ „
„	„ „	„	„	354 54 58·03	5·1968582,5	174 55 38·87	XIV (Hatarvat)
	XIII (Mávinhúnda)	16 25 4·19	74 50 7·56	77 14 48·62	5·0412545,6	257 9 37·88	„ „
	„ „	„	„	359 9 25·39	5·0245964,8	179 9 29·86	XV (Karabgati)
	„ „	„	„	314 4 49·01	5·1434817,5	134 9 36·61	XVI (Manikeri)
28	XIV (Hatarvat)	16 21 2·67	74 31 45·96	306 45 41·90	5·1334472,5	126 50 54·41	XV (Karabgati)
„	„ „	„	„	8 55 12·10	4·9575146,5	188 54 31·79	XVII (Karigudd)
	XV (Karabgati)	16 7 34·87	74 50 23·53	264 46 4·25	4·9948225,6	84 50 44·91	XVI (Manikeri)
	„ „	„	„	86 16 8·47	5·0908386,4	266 10 18·23	XVII (Karigudd)
	„ „	„	„	321 53 45·72	5·0166816,9	141 56 47·00	XVIII (Kathárigad)
	„ „	„	„	20 6 58·41	4·9250694,7	200 5 36·56	XIX (Kolanhatti)
	XVI (Manikeri)	16 9 3·57	75 7 13·22	20 45 48·35	4·9869381,2	200 44 11·03	XVIII (Kathárigad)
29	XVII (Karigudd)	16 6 14·30	74 29 21·72	306 56 55·92	5·0713226,1	127 1 22·07	XIX (Kolanhatti)
	XVIII (Kathárigad)	15 54 3·70	75 1 20·69	91 44 36·16	4·9689881,8	271 40 14·79	„ „
	„ „	„	„	30 40 35·04	5·0545618,8	210 37 54·17	XX (Chikk Nandihallígudd)
	„ „	„	„	308 13 13·56	5·0027086,3	128 16 54·17	XXI (Hirĕkummígudd)
30	XIX (Kolanhatti)	15 54 31·21	74 45 26·92	340 35 24·92	5·0267449,5	160 37 3·23	XX (Chikk Nandihallígudd)
„	„ „	„	„	50 8 56·97	4·9379866,6	230 5 51·03	XXII (Yalúr)
	XX (Chikk Nandihallígudd)	15 37 56·39	74 51 28·64	255 30 41·06	5·1503636,1	75 36 59·87	XXI (Hirĕkummígudd)
	„ „	„	„	113 44 18·93	5·0464716,2	293 39 36·73	XXII (Yalúr)
	„ „	„	„	76 8 30·67	5·0205521,6	256 3 50·64	XXIII (Samshergad)
	„ „	„	„	311 57 34·30	5·0504568,9	132 1 22·93	XXIV (Navalúr)
	„ „	„	„	345 32 56·06	4·9237740,8	165 33 53·34	XXV (Kalkera)
	XXI (Hirĕkummígudd)	15 43 45·90	75 14 50·16	25 53 3·42	5·0887598,4	205 50 36·38	XXIV (Navalúr)
31	XXII (Yalúr)	15 45 20·01	74 34 5·35	359 51 12·55	4·8445727,6	179 51 13·04	XXIII (Samshergad)
32	XXIII (Samshergad)	15 33 46·66	74 34 7·18	294 30 2·99	5·1302064,3	114 35 38·21	XXV (Kalkera)
	XXIV (Navalúr)	15 25 31·17	75 5 42·60	84 27 4·16	4·7985553,9	264 24 14·05	„ „
	„ „	„	„	36 33 30·61	4·9165485,4	216 31 17·84	XXVI (Ganigudd)

Station A				Side A B			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	XXIV (Navalúr)	15 25 31·17	75 5 42·60	312 32 1·95	4·9629426,4	132 35 4·81	XXVII (Kundgol)
33	XXV (Kalkera)	15 24 30·61	74 55 2·70	347 22 4·06	4·7901704,6	167 22 40·48	XXVI (Ganigudd)
,,	,, ,,	,,	,,	49 26 11·38	5·0649687,0	229 22 13·53	XXVIII (Kánsĕrudi)
34	XXVI (Ganigudd)	15 14 33·68	74 57 20·50	267 53 59·19	5·0677693,7	87 59 13·04	XXVII (Kundgol)
,,	,, ,,	,,	,,	81 26 17·30	5·0122710,4	261 21 44·53	XXVIII (Kánsĕrudi)
,,	,, ,,	,,	,,	330 31 48·81	4·9578889,3	150 33 47·77	XXIX (Indúr)
,,	,, ,,	,,	,,	29 12 35·95	5·0144533,8	209 10 21·68	XXX (Rámankŏp)
	XXVII (Kundgol)	15 15 15·28	75 17 13·82	40 59 16·77	5·0422117,6	220 56 4·11	XXIX (Indúr)
	XXVIII (Kánsĕrudi)	15 12 1·13	74 40 1·60	325 32 32·05	4·9580082,0	145 34 48·56	XXX (Rámankŏp)
	XXIX (Indúr)	15 1 29·91	75 4 56·15	83 18 12·35	4·9811941,2	263 14 1·02	,, ,,
	,, ,,	,,	,,	24 4 49·40	4·9679431,7	204 3 10·00	XXXI (Bhedasgávegudda)
	,, ,,	,,	,,	331 2 19·40	5·1718408,7	151 5 27·15	XXXII (Karĕkyatanhalli)
35	XXX (Rámankŏp)	14 59 38·59	74 48 45·71	322 5 5·56	4·9696339,8	142 7 35·68	XXXI (Bhedasgávegudda)
,,	,, ,,	,,	,,	20 12 46·67	4·9743124,9	200 11 21·48	XXXIII (Menshigudda)
	XXXI (Bhedasgávegudda)	14 47 28·79	74 58 29·82	292 19 36·31	5·0746230,3	112 24 20·84	XXXII (Karĕkyatanhalli)
	,, ,,	,,	,,	80 38 6·39	4·9594746,3	260 34 12·84	XXXIII (Menshigudda)
	,, ,,	,,	,,	358 9 18·41	5·1046010,3	178 9 28·93	XXXIV (Chandragutti)
	,, ,,	,,	,,	41 44 33·33	5·1581465,1	221 40 26·72	XXXV (Halĕbail)
	XXXII (Karĕkyatanhalli)	14 40 0·64	75 17 8·94	52 16 6·76	5·1266202,6	232 11 36·01	XXXIV (Chandragutti)
36	XXXIII (Menshigudda)	14 45 1·28	74 43 13·79	320 1 27·04	5·1657359,1	140 5 28·38	,, ,,
,,	,, ,,	,,	,,	3 36 44·62	4·9673582,4	183 36 29·60	XXXV (Halĕbail)
	XXXIV (Chandragutti)	14 26 27·56	74 59 11·51	101 11 51·30	5·0080000,4	281 7 37·16	,, ,,
	,, ,,	,,	,,	49 41 5·15	4·9524791,5	229 38 12·74	XXXVI (Hukaligudda)
	,, ,,	,,	,,	354 56 53·24	5·0470321,7	174 57 17·86	XXXIX (Koramúr)
	,, ,,	,,	,,	305 31 24·62	5·0136420,4	125 34 56·44	XL (Hŏnnavalli)
37	XXXV (Halĕbail)	14 29 43·13	74 42 14·29	337 50 2·83	4·9239589,2	157 51 22·86	XXXVI (Hukaligudda)
,,	,, ,,	,,	,,	41 12 16·15	4·7834058,5	221 10 34·70	XXXVII (Kaltigudda)
38	XXXVI (Hukaligudda)	14 16 52·09	74 47 36·38	114 6 35·45	4·8949334,0	294 3 35·04	,, ,,
,,	,, ,,	,,	,,	26 47 54·84	4·7809115,8	206 46 46·93	XXXVIII (Dindĕmane)
,,	,, ,,	,,	,,	304 5 57·72	4·9751598,7	124 9 12·81	XXXIX (Koramúr)
	XXXVII (Kaltigudda)	14 22 9·86	74 35 27·24	332 36 52·90	4·9857613,9	152 38 44·28	XXXVIII (Dindĕmane)
39	XXXVIII (Dindĕmane)	14 7 57·48	74 42 59·68	269 27 52·43	5·0229694,6	89 32 14·09	XXXIX (Koramúr)
,,	,, ,,	,,	,,	325 47 49·33	5·0839529,6	145 50 36·77	XLII (Kŏdashádri)
	XXXIX (Koramúr)	14 8 6·59	75 0 51·25	235 28 13·26	4·9544356,7	55 31 18·39	XL (Hŏnnavalli)
	,, ,,	,,	,,	317 3 30·53	5·0601375,3	137 6 42·99	XLI (Hugadi)
	,, ,,	,,	,,	20 14 41·43	5·0332198,9	200 13 9·72	XLII (Kŏdashádri)
	XL (Hŏnnavalli)	14 16 32·46	75 13 25·66	358 19 40·15	5·1308983,6	178 19 49·90	XLI (Hugadi)
	XLI (Hugadi)	13 54 12·31	75 14 5·72	81 35 18·14	5·0677015,6	261 30 36·59	XLII (Kŏdashádri)
	,, ,,	,,	,,	351 31 45·36	4·8986787,6	171 32 13·58	XLIII (Siddeshvar)
	,, ,,	,,	,,	24 58 48·49	5·1175587,5	204 56 35·17	XLIV (Bisale)

Station A				Side A B			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
40	XLII (Kŏdashádri)	13 51 21·96	74 54 32·04	295 36 49·06	5·1499587,7	115 41 56·63	XLIII (Siddeshvar)
"	" "	"	"	329 17 1·73	5·0727380,4	149 19 26·92	XLIV (Bisale)
	XLIII (Siddeshvar)	13 41 15·41	75 16 4·06	58 52 0·14	4·8938053,7	238 49 19·95	" "
	" "	"	"	328 21 38·68	5·0848991,3	148 24 10·05	XLV (Hirĕgudda)
	" "	"	"	292 49 8·19	5·1521797,8	112 54 20·40	XLVI (Hĕbbe)
41	XLIV (Bisale)	13 34 33·56	75 4 44·39	295 40 57·35	5·1619809,2	115 46 6·64	XLV (Hirĕgudda)
"	" "	"	"	350 9 17·31	4·9355696,7	170 9 52·07	XLVII (Valkunji)
	XLV (Hirĕgudda)	13 24 8·40	75 26 50·33	234 11 34·53	4·9177488,3	54 14 13·00	XLVI (Hĕbbe)
	" "	"	"	79 21 4·51	5·0725677,5	259 16 32·39	XLVII (Valkunji)
	" "	"	"	26 42 10·17	5·0472406,2	206 40 13·82	III (Kudurĕmukha)
	" "	"	"	291 2 19·48	4·9777374,9	111 5 46·93	VI (Ánúr)
	XLVI (Hĕbbe)	13 32 8·33	75 38 10·66	345 23 55·73	4·9308886,9	165 24 46·28	" "
42	XLVII (Valkunji)	13 20 31·02	75 7 13·72	319 34 47·46	5·0087142,5	139 37 20·74	III (Kudurĕmukha)
43	III (Kudurĕmukha)	13 7 40·32	75 18 23·26	244 42 8·43	5·1859637,2	64 47 29·73	VI (Ánúr)
	VI (Ánúr)	13 18 29·67	75 41 48·43				

NOTE.—Stations III (Kudurĕmukha) and VI (Ánúr) appertain to the Madras Longitudinal Series.

April, 1888.

S. G. BURRARD,
In charge of Computing Office.

MANGALORE MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.

The following table gives, first, the usual data of the observed vertical angles and the heights of the signal and instrument, &c., in pairs of horizontal lines, the first line of which gives the data for the 1st or the fixed station, and the second line the data for the 2nd or the deduced station. This is followed by the arc contained between the two stations, and then by the terrestrial refraction and the height of the 2nd station above or below the 1st, as computed from the vertical angles in the usual manner. This difference of height applied to the given height above mean sea level of the fixed station, gives that of the deduced station. Usually there are two or three independent values of the height of the deduced station; the details are so arranged as to show these consecutively and their mean in the columns of "Trigonometrical Results." The mean results thus obtained are however liable to receive corrections for the errors generated in the trigonometrical operations, which are shown up by the spirit levelling operations, wherever a junction between the two has been effected. The spirit levelled determinations are always accepted as final, and the trigonometrical heights of stations lying between those fixed by the levelling operations are adjusted by simple proportion to accord with the latter. In the table the spirit levelled values are printed thus, **2007·96**, &c., to distinguish them from the adjusted trigonometrical values. The column in which the mean trigonometrical heights are given is barred across where necessary, as after deduction of Stn. VI from Stn. IV, page 75—D., to indicate that one set of adjustments ends and another begins. The trigonometrical heights always refer to the upper mark or to the upper surface of the pillar or structure on which the theodolite stood; when a spirit levelled height does not refer to either of these surfaces, it is given in combination with a correction, thus $\left\{\begin{array}{l}3134{\cdot}19\\ -\ 3{\cdot}5\end{array}\right.$, and the sum of these two quantities, in this case 3130·69, represents the value with which the corresponding trigonometrical mean height 3127·9 is comparable. Descriptions follow these tables, exactly indicating the surfaces on which the levelling staff stood during the determinations of the spirit levelled heights.

When the pillar of the station is perforated, the height given in the last column is that between the upper surface of pillar and the ground level mark-stone in the floor of the passage; otherwise, it is the approximate height of the structure above the ground at the base of the station.

The heights of the initial stations above Mean Sea Level are taken from the Bombay Longitudinal Series and are as follows:—

XVII (Kem) **1951·21** feet; XIX (Alsunda) $\left\{\begin{array}{l}\mathbf{2165{\cdot}21}\\ -\ 2{\cdot}00\end{array}\right.$ feet; XXII (Bori) $\left\{\begin{array}{l}\mathbf{2005{\cdot}14}\\ -\ 2{\cdot}58\end{array}\right.$ feet.

Astronomical Date 1868	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Mar. 5,13	2 17	XIX (Alsunda)	D 0 13 33·0	8	2·5	5·3	1222	60	·049	− 154·2	2009·0	2004·7	**2007·96**	7·1
Apr. 11,13	2 29	I (Kalas)	D 0 4 57·4	8	2·7	5·3								
„ 7,8	2 27	XXII (Bori)	D 0 9 11·1	8	2·6	5·3	1166	41	·035	− 2·3	2000·3			
„ 11,12,13	2 46	I (Kalas)	D 0 9 3·2	12	2·6	5·3								

NOTE.—Stations XVII (Kem), XIX (Alsunda) and XXII (Bori) appertain to the Bombay Longitudinal Series.

Astronomical Date 1865		Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
		h m		° ′ ″				″							feet
Feb.	6,7	2 48	XXII (Bori)	E 0 6 22·0	8	2·5	5·3	2183	130	·059	+1438·5	3441·1			
„	25,27	2 54	III (Palvan)	D 0 38 31·0	4	2·7	5·7						3445·6	3446	5
„	13	2 45	I (Kalas)	E 0 15 13·9	4	2·6	5·3	1742	101	·058	+1442·0	3450·0			
„	25	3 2	III (Palvan)	D 0 41 0·0	4	2·7	5·7								
„	15	3 6	XVII (Kem)	D 0 9 4·8	4	2·5	5·3	2074	113	·054	+ 388·7	*2339·9			
„	20	2 58	II (Sulki)	D 0 21 48·9	4	2·6	5·2								
„	11,13	2 41	I (Kalas)	D 0 2 24·6	8	2·5	5·3	1433	84	·059	+ 344·6	2352·6			
„	18,20	2 52	II (Sulki)	D 0 18 47·6	6	2·7	5·2						2352·5	2354	‡
„	25	2 56	III (Palvan)	D 0 35 25·2	4	2·5	5·7	1556	85	·055	−1093·3	2352·3			
„	18,20	2 50	II (Sulki)	E 0 12 12·0	6	2·6	5·2								
„	18,20	2 49	II (Sulki)	E 0 13 46·2	8	2·5	5·2	1178	61	·052	+ 784·9	3137·4			
Mar.	8,9	2 51	IV (Páchvad)	D 0 31 31·1	8	2·5	5·3						3136·2	3138	5·1
Feb.	25	2 35	III (Palvan)	D 0 18 5·1	4	2·6	5·7	1379	69	·050	− 310·7	3134·9			
Mar.	4,8	2 40	IV (Páchvad)	D 0 2 44·7	8	2·7	5·3								
Feb.	25	2 45	III (Palvan)	D 0 18 21·0	4	2·6	5·7	1061	49	·047	− 318·5	3127·1			
Mar.	1	2 42	VI (Aundh)	E 0 2 7·0	4	2·7	5·3						3127·9	3134·19 −3·5†	5·1
„	8,9	2 47	IV (Páchvad)	D 0 8 6·9	8	2·7	5·3	1047	56	·054	− 7·6	3128·6			
„	1	2 23	VI (Aundh)	D 0 7 37·7	4	2·6	5·3								
Feb.	18,20	2 52	II (Sulki)	D 0 18 38·7	6	2·5	5·2	876	52	·060	− 312·0	2041·9			
Mar.	11	2 56	V (Katphal)	E 0 5 34·6	4	2·5	5·3						2040·9	2041	5·0
„	8	3 5	IV (Páchvad)	D 0 38 53·9	4	2·6	5·3	1268	65	·051	−1098·4	2039·9			
„	11	2 43	V (Katphal)	E 0 19 47·1	4	2·7	5·3								
„	4,8	2 25	IV (Páchvad)	D 0 12 50·8	8	2·6	5·3	1259	65	·052	− 124·6	3013·7			
„	14,16	2 44	VII (Palsi)	D 0 6 6·3	8	2·7	5·3								
„	11	3 4	V (Katphal)	E 0 12 50·9	4	2·6	5·3	1413	80	·057	+ 969·1	3010·0	3012·5	3013	5
„	14,15	3 4	VII (Palsi)	D 0 33 51·5	8	2·6	5·3								
„	20	2 30	VIII (Kundal)	D 0 4 1·5	4	2·6	5·3	1533	86	·055	+ 334·2	3013·7			
„	14,16	2 49	VII (Palsi)	D 0 18 47·9	8	2·5	5·3								
„	8,9	2 48	IV (Páchvad)	D 0 21 50·0	8	2·5	5·3	1673	91	·054	− 460·0	2678·3			
„	20	2 7	VIII (Kundal)	D 0 3 7·3	4	2·7	5·3								
„	1	3 10	VI (Aundh)	D 0 21 22·6	4	2·5	5·3	1554	90	·058	− 450·0	2680·7	2678·9	2679	5·1
„	20	2 19	VIII (Kundal)	D 0 1 38·3	4	2·7	5·3								
„	14,16	2 49	VII (Palsi)	D 0 18 47·9	8	2·5	5·3	1533	86	·055	− 334·2	2677·7			
„	20	2 30	VIII (Kundal)	D 0 4 1·5	4	2·6	5·3								
Nov.	25	2 31	VII (Palsi)	D 0 12 21·6	4	2·7	5·3	1090	61	·056	− 134·8	2877·7			
Dec.	7	2 10	IX (Dandoba Dongar)	D 0 3 55·9	4	2·7	5·3						2876·5	2877	5·2

NOTE.—Stations XVII (Kem) and XXII (Bori) appertain to the Bombay Longitudinal Series.
* Rejected. † Assumed height of the rectangular protecting pillar above the circular pillar. ‡ See description of this station, page 4—D.

Astronomical Date 1865		Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
		h m		° ′ ″				″							feet
Nov.	21,22	2 29	VIII (Kundal)	D 0 5 30·1	8	2·6	5·4	1396	86	·061	+196.4	2875·3			
Dec.	7	2 46	IX (Dandoba Dongar)	D 0 15 2·6	4	2·7	5·3								
Nov.	25	2 23	VII (Palsi)	D 0 24 53·1	4	2·6	5·3	1172	67	·057	−558·1	2454·4			
„	28,29	2 29	X (Daphlápur)	E 0 7 26·0	8	2·7	5·3						2454·7	2455	4·8
Dec.	6	2 48	IX (Dandoba Dongar)	D 0 20 35·0	4	2·6	5·3	1336	79	·059	−421·5	2455·0			
Nov.	29	2 20	X (Daphlápur)	E 0 0 48·0	4	2·7	5·3								
Dec.	7,8	2 24	IX (Dandoba Dongar)	D 0 30 5·8	6	2·6	5·3	1451	88	·061	−829·9	2046·6			
„	2	2 18	XI (Athni)	E 0 8 43·3	4	2·7	5·3						2047·8	2048	5·0
Nov.	29	1 58	X (Daphlápur)	D 0 20 56·6	4	2·6	5·3	1120	49	·044	−405·8	2048·9			
Dec.	1	2 50	XI (Athni)	E 0 3 45·2	4	2·6	5·3								
Nov.	21,22	2 39	VIII (Kundal)	D 0 10 57·4	8	2·6	5·4	1244	78	·063	− 66·4	2612·5			
Dec.	12	2 14	XII (Majala)	D 0 7 19·1	4	2·7	5·3						2612·4	2613	5·0
„	6,8	2 40	IX (Dandoba Dongar)	D 0 16 15·2	8	2·8	5·3	1138	71	·062	−264·2	2612·3			
„	11	2 37	XII (Majala)	D 0 0 30·3	4	2·6	5·3								
„	7,8	2 26	IX (Dandoba Dongar)	D 0 18 50·1	8	2·7	5·3	1818	114	·063	−295·0	2581·5			
„	18,19	2 27	XIII (Mávinhúnda)	D 0 7 46·7	8	2·6	5·3								
„	2	2 49	XI (Athni)	E 0 0 44·0	4	2·6	5·3	1518	92	·061	+532·0	2579·8			
„	18,19	2 19	XIII (Mávinhúnda)	D 0 23 4·9	8	2·7	5·3						2581·0	2582	5·0
„	11,12	2 42	XII (Majala)	D 0 13 38·1	8	2·6	5·3	1774	107	·060	− 30·7	2581·7			
„	18,19	2 36	XIII (Mávinhúnda)	D 0 12 27·3	8	2·7	5·3								
„	14,15	2 25	XIV (Hatarvat)	D 0 14 54·6	8	2·6	5·3	1084	65	·060	−219·6	2580·9			
„	18,19	2 42	XIII (Mávinhúnda)	D 0 1 10·5	8	2·7	5·3								
„	7,8	2 50	IX (Dandoba Dongar)	D 0 17 27·5	8	2·6	5·3	2235	142	·064	− 76·3	2800·2			
„	14	2 23	XIV (Hatarvat)	D 0 15 8·1	4	2·6	5·3								
„	11	2 57	XII (Majala)	D 0 7 18·0	4	2·6	5·3	1560	99	·063	+188·4	2800·8	2800·5	2801	5·0
„	14,15	2 7	XIV (Hatarvat)	D 0 15 31·7	8	2·7	5·3								
„	18,19	2 42	XIII (Mávinhúnda)	D 0 1 10·5	8	2·7	5·3	1084	65	·060	+219·6	2800·6			
„	14,15	2 25	XIV (Hatarvat)	D 0 14 54·6	8	2·6	5·3								
„	18,19	2 50	XIII (Mávinhúnda)	D 0 9 5·2	8	2·6	5·3	1049	61	·058	− 38·9	2542·1			
„	23,27,30	2 31	XV (Karabgati)	D 0 6 33·6	12	2·6	5·3						2542·9	2544	5·0
„	14,15	2 48	XIV (Hatarvat)	D 0 16 26·0	8	2·6	5·3	1343	79	·059	−256·9	2543·6			
„	23,27,30	2 18	XV (Karabgati)	D 0 3 26·3	12	2·7	5·3								
„	18,19	3 0	XIII (Mávinhúnda)	D 0 15 24·3	8	2·6	5·3	1376	78	·057	−209·5	2371·5			
„	21	2 49	XVI (Manikeri)	D 0 5 3·2	4	2·6	5·3						2372·0	2373	5·0
„	23,27,30	2 41	XV (Karabgati)	D 0 13 13·0	12	2·6	5·3	974	55	·057	−170·5	2372·4			
„	21	2 42	XVI (Manikeri)	D 0 1 21·3	4	2·6	5·3								

Astronomical Date 1865-66	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Dec. 14,15	2 47	XIV (Hatarvat)	E 0 0 13·9	8	2·6	5·3	899	54	·060	+183·0	2983·5			
Jan. 2	2 21	XVII (Karigudd)	D 0 13 38·0	4	2·7	5·3						2983·4	2984	5·0
Dec. 26,27,30	2 50	XV (Karabgati)	E 0 3 16·0	12	2·8	5·3	1215	71	·058	+440·3	2983·2			
Jan. 2	2 39	XVII (Karigudd)	D 0 21 17·4	4	2·8	5·3								
Dec. 26,30	2 46	XV (Karabgati)	D 0 0 38·3	8	2·6	5·3	1028	56	·055	+214·1	2757·0			
Jan. 12,13	2 48	XVIII (Kathárigad)	D 0 14 47·7	8	2·8	5·3								
Dec. 21	2 11	XVI (Manikeri)	E 0 6 32·1	4	2·6	5·3	962	60	·062	+385·2	2757·2	2758·4	2759	4·9
Jan. 12,13	2 33	XVIII (Kathárigad)	D 0 20 45·1	8	2·6	5·3								
„ 6,8	2 34	XIX (Kolanhatti)	D 0 14 6·6	8	2·6	5·3	918	52	·057	−195·7	2761·0			
„ 12,13	2 36	XVIII (Kathárigad)	E 0 0 20·9	8	2·7	5·3								
Dec. 26,27,30	2 51	XV (Karabgati)	E 0 10 29·7	12	2·6	5·3	834	37	·045	+414·5	2957·4			
Jan. 6,9	2 37	XIX (Kolanhatti)	D 0 23 21·5	8	2·8	5·3								
„ 2	2 50	XVII (Karigudd)	D 0 9 29·3	4	2·6	5·3	1164	66	·056	− 27·5	2955·9	2955·4	2956	5·0
„ 8,9	2 34	XIX (Kolanhatti)	D 0 7 52·9	8	2·7	5·3								
„ 12,13	2 36	XVIII (Kathárigad)	E 0 0 20·9	8	2·7	5·3	918	52	·057	+195·7	2952·8			
„ 6,8	2 34	XIX (Kolanhatti)	D 0 14 6·6	8	2·6	5·3								
„ 12,13	2 50	XVIII (Kathárigad)	D 0 13 2·9	8	2·6	5·3	1123	64	·057	−154·2	2604·2			
„ 27	2 46	XX (Chikk Nandihallígudd)	D 0 3 42·1	4	2·7	5·3						2604·7	2606	5·0
„ 6,8	2 44	XIX (Kolanhatti)	D 0 19 9·0	8	2·6	5·3	1054	62	·059	−350·2	2605·2			
„ 27	2 21	XX (Chikk Nandihallígudd)	E 0 3 29·9	4	3·0	5·3								
„ 12,13	2 35	XVIII (Kathárigad)	D 0 16 45·4	8	2·6	5·3	994	55	·056	−272·3	2486·1			
„ 15	2 29	XXI (Hirĕkummígudd)	E 0 1 51·0	4	2·7	5·3						2485·6	2487	5·1
„ 27,29	2 44	XX (Chikk Nandihallígudd)	D 0 13 15·9	6	2·6	5·3	1394	80	·057	−119·7	2485·0			
„ 15	2 39	XXI (Hirĕkummígudd)	D 0 7 26·6	4	2·6	5·3								
„ 6,8	2 55	XIX (Kolanhatti)	E 0 6 26·8	8	2·6	5·3	857	45	·053	+326·5	3281·9			
Feb. 2,3	2 20	XXII (Yalúr)	D 0 19 26·0	8	2·7	5·3						3281·5	3283	6
Jan. 29	2 17	XX (Chikk Nandihallígudd)	E 0 12 48·6	4	2·6	5·3	1098	70	·064	+676·3	3281·0			
Feb. 2,3	2 31	XXII (Yalúr)	D 0 28 56·9	8	2·8	5·3								
Jan. 29	2 27	XX (Chikk Nandihallígudd)	E 0 5 10·7	6	2·6	5·3	1034	60	·058	+392·8	2997·5			
„ 31, Feb. 1	2 27	XXIII (Samshergad)	D 0 20 33·9	8	2·8	5·3						2998·0	2999	*
Feb. 2,3	2 41	XXII (Yalúr)	D 0 19 4·6	8	2·6	5·3	693	45	·065	−283·1	2998·4			
Jan. 31, Feb. 1	2 34	XXIII (Samshergad)	E 0 8 46·4	8	2·7	5·3								
„ 29	2 48	XX (Chikk Nandihallígudd)	D 0 13 15·0	4	2·7	5·3	1110	61	·055	−161·2	2443·5			
„ 17,25	2 37	XXIV (Navalúr)	D 0 3 23·3	8	2·6	5·3								
„ 15	2 48	XXI (Hirĕkummígudd)	D 0 10 6·4	4	2·7	5·3	1215	73	·060	− 39·9	2445·7	2444·0	2445	5·1
„ 17	2 39	XXIV (Navalúr)	D 0 7 52·5	4	2·6	5·3								

* Not forthcoming.

Astronomical Date 1866	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
(1)	2 52	XXV (Kalkera)	D 0 11 15·3	8	2·7	5·3	620	34	·055	−119·2	2442·9			
(2)	2 33	XXIV (Navalúr)	E 0 1 46·4	12	2·6	5·3								
Jan. 27,29	2 48	XX (Chikk Nandihallígudd)	D 0 7 58·7	8	2·7	5·3	832	48	·058	− 42·4	2562·3			
„ 24	2 58	XXV (Kalkera)	D 0 4 21·7	4	6·2	5·4								
„ 31,Feb.1	2 16	XXIII (Samshergad)	D 0 20 56·9	8	2·7	5·3	1332	79	·060	−436·1	2561·9	2562·7	2564	4·5
„ 24	2 49	XXV (Kalkera)	E 0 1 15·5	4	2·6	5·4								
(2)	2 33	XXIV (Navalúr)	E 0 1 46·4	12	2·6	5·3	620	34	·055	+119·2	2563·8			
(1)	2 52	XXV (Kalkera)	D 0 11 15·3	8	2·7	5·3								
1867														
Feb. 27,28	2 35	XXIV (Navalúr)	D 0 8 52·8	8	2·6	5·3	817	41	·051	− 63·7	2380·3			
Mar. 12,13	3 3	XXVI (Ganigudd)	D 0 3 34·1	8	2·7	5·3						2380·7	2382	4·0
Feb. 23	2 7	XXV (Kalkera)	D 0 14 48·0	4	2·6	5·3	612	34	·056	−181·7	2381·0			
Mar. 13,14	2 48	XXVI (Ganigudd)	E 0 5 26·9	8	2·6	5·3								
Feb. 27,28	2 15	XXIV (Navalúr)	D 0 18 2·4	8	2·6	5·3	908	48	·053	−298·7	2145·3			
Mar. 2,4	3 10	XXVII (Kundgol)	E 0 4 19·8	8	2·7	5·3						2145·4	2147·06	10·0
„ 12,13	3 10	XXVI (Ganigudd)	D 0 15 38·6	8	2·6	5·3	1152	57	·050	−235·3	2145·4			
„ 2,4	3 0	XXVII (Kundgol)	D 0 1 48·4	8	2·6	5·3								
Feb. 23	2 19	XXV (Kalkera)	D 0 19 30·0	4	2·7	5·3	1148	73	·063	−374·0	2190·1			
„ 19	1 33	XXVIII (Kánsĕrudi)	E 0 2 38·2	6	2·6	5·3						2190·2	2190	5·7
Mar. 12,14	2 18	XXVI (Ganigudd)	D 0 13 52·5	8	2·8	5·3	1014	64	·064	−191·9	2190·3			
Feb. 18,19	2 24	XXVIII (Kánsĕrudi)	D 0 1 3·2	8	2·6	5·3								
Mar. 12,14	2 40	XXVI (Ganigudd)	D 0 9 4·6	8	2·6	5·3	899	53	·059	− 62·4	2319·8			
„ 27,28	3 25	XXIX (Indúr)	D 0 4 21·0	12	2·6	5·3								
„ 2,4	3 18	XXVII (Kundgol)	D 0 3 9·3	8	2·6	5·3	1090	39	·036	+172·1	2319·2	2319·5	2319	5·0
„ 25,27	3 14	XXIX (Indúr)	D 0 13 53·0	8	2·7	5·3								
„ 19,20	2 23	XXX (Rámankŏp)	E 0 6 12·2	8	2·6	5·3	944	55	·058	+369·4	2319·4			
„ 27	3 9	XXIX (Indúr)	D 0 20 18·3	8	2·8	5·3								
„ 14	2 13	XXVI (Ganigudd)	D 0 22 0·2	12	2·6	5·3	1024	58	·057	−431·5	1950·7			
„ 19,20	2 16	XXX (Rámankŏp)	E 0 6 41·4	8	2·6	5·3								
Feb. 18,19	2 13	XXVIII (Kánsĕrudi)	D 0 15 49·3	12	2·6	5·3	899	53	·060	−240·9	1949·3	1950·0	1949	5·0
Mar. 19,20	2 11	XXX (Rámankŏp)	E 0 2 25·8	8	2·8	5·3								
„ 27	3 9	XXIX (Indúr)	D 0 20 18·3	8	2·8	5·3	944	55	·058	−369·4	1950·1			
„ 19,20	2 23	XXX (Rámankŏp)	E 0 6 12·2	8	2·6	5·3								
„ 25,28	3 14	XXIX (Indúr)	D 0 8 23·0	8	2·6	5·3	920	54	·059	− 41·0	2278·5			
Apr. 18,22	3 1	XXXI (Bhedasgávegudda)	D 0 5 20·6	12	2·7	5·3						2278·9	2278	8·0
Mar. 19,20	2 31	XXX (Rámankŏp)	E 0 5 11·7	8	2·6	5·3	923	51	·055	+329·3	2279·3			
Apr. 18	2 55	XXXI (Bhedasgávegudda)	D 0 19 4·9	8	2·6	5·3								

(1). The mean of observations taken on 24th January, 1866, and 23rd February, 1867.
(2). Do. do. 25th do. 27th and 28th February, 1867.

Astronomical Date 1867	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Mar. 27,28	3 16	XXIX (Indúr)	D 0 15 59·0	8	2·5	5·3	1471	82	·055	−216·8	2102·7			
Apr. 6	3 2	XXXII (Karĕkyatanhalli)	D 0 5 56·5	12	2·7	5·3								
„ 22	3 3	XXXI (Bhedasgávegudda)	D 0 13 56·5	8	2·6	5·3	1171	60	·051	−176·1	2102·8	2102·8	2101	5·0
„ 6	2 56	XXXII (Karĕkyatanhalli)	D 0 3 44·8	8	2·6	5·3								
Mar. 19,20	2 16	XXX (Rámankŏp)	E 0 10 1·1	12	2·9	5·3	934	52	·056	+466·8	2416·8			
Apr. 30, May 1	3 1	XXXIII (Menshigudda)	D 0 24 2·4	8	2·6	5·3								
„ 22,23	2 57	XXXI (Bhedasgávegudda)	D 0 1 26·1	8	2·6	5·3	898	55	·061	+138·9	2417·8	2417·3	2416	5·0
„ 30, May 1	3 10	XXXIII (Menshigudda)	D 0 11 54·8	8	2·7	5·3								
„ 18,23	3 2	XXXI (Bhedasgávegudda)	E 0 4 23·8	14	2·6	5·3	1262	70	·056	+511·3	2790·2			
May 18,20	2 48	XXXIV (Chandragutti)	D 0 23 13·7	8	2·7	5·3								
Apr. 6	2 55	XXXII (Karĕkyatanhalli)	E 0 7 52·4	8	2·6	5·3	1322	79	·059	+687·1	2789·9			
May 18,20	2 39	XXXIV (Chandragutti)	D 0 27 25·1	8	2·6	5·3								
Apr. 30, May 1	3 3	XXXIII (Menshigudda)	D 0 1 53·1	8	2·6	5·3	1448	88	·061	+374·3	2791·6	2791·1	2789	5·0
May 18,20	2 56	XXXIV (Chandragutti)	D 0 19 27·1	8	2·6	5·3								
(1)	2 33	XXXV (Halĕbail)	E 0 9 45·7	20	2·6	5·3	1006	61	·060	+510·4	2792·6			
(2)	2 40	XXXIV (Chandragutti)	D 0 24 41·0	20	2·7	5·3								
Apr. 22,24	3 4	XXXI (Bhedasgávegudda)	D 0 10 33·6	8	2·6	5·3	1424	76	·054	+ 4·0	2282·9			
May 10	2 52	XXXV (Halĕbail)	D 0 10 44·8	4	2·7	5·3								
Apr. 30, May 1	2 43	XXXIII (Menshigudda)	D 0 11 54·2	8	2·6	5·3	920	54	·059	−135·8	2281·5	2281·5	2279	6
May 10	2 53	XXXV (Halĕbail)	D 0 1 50·2	8	2·6	5·3								
(2)	2 40	XXXIV (Chandragutti)	D 0 24 41·0	20	2·7	5·3	1006	61	·060	−510·4	2280·2			
(1)	2 33	XXXV (Halĕbail)	E 0 9 45·7	20	2·6	5·3								
1872 Dec. 10,12,13,14	2 15	XXXIV (Chandragutti)	D 0 13 7·1	16	2·7	5·3	886	53	·060	−169·9	2621·2			
„ 22,23,24	2 16	XXXVI (Hukaligudda)	D 0 0 5·5	12	2·6	5·3								
Nov. 29,30, Dec. 3	2 45	XXXV (Halĕbail)	E 0 7 47·2	16	2·6	5·3	830	51	·061	+341·0	2622·5	2621·9	2620	4·8
Dec. 22,23,24	2 46	XXXVI (Hukaligudda)	D 0 20 8·7	12	2·6	5·3								
Nov. 29,30, Dec. 3	1 58	XXXV (Halĕbail)	D 0 8 10·6	14	2·8	5·3	601	41	·069	− 65·6	2215·9			
„ 20,21	2 1	XXXVII (Kaltigudda)	D 0 0 45·4	12	2·7	5·3								
Dec. 22,23,25	1 44	XXXVI (Hukaligudda)	D 0 23 33·4	12	2·8	5·3	776	51	·065	−407·0	2214·9	2215·4	2213	5·0
Nov. 20,21	1 46	XXXVII (Kaltigudda)	E 0 12 4·5	12	2·7	5·3								
Dec. 22,23,24	2 0	XXXVI (Hukaligudda)	D 0 20 42·0	12	2·7	5·3	597	34	·058	−283·6	2338·3			
1873 Jan. 11,12	2 0	XXXVIII (Dindĕmane)	E 0 11 35·5	12	2·7	5·3								
1872 Nov. 20,21	2 14	XXXVII (Kaltigudda)	D 0 2 42·5	12	2·7	5·3	957	59	·061	+123·4	2338·8	2338·6	2335	5·0
1873 Jan. 11,12	2 15	XXXVIII (Dindĕmane)	D 0 11 28·1	12	2·8	5·3								
1872 Dec. 12,13	2 46	XXXIV (Chandragutti)	D 0 16 14·5	12	2·7	5·3	1102	64	·058	−260·7	2530·4			
1873 Jan. 4,5,6	2 44	XXXIX (Koramúr)	D 0 0 9·5	16	2·6	5·3								

(1) The mean of observations taken on 10th May, 1867, and 29th and 30th November, 1872.
(2) Do. do. 20th do. 12th and 13th December, do.

Astronomical Date 1872-73	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Dec. 22,23,24	2 30	XXXVI (Hukaligudda)	D 0 10 16·8	12	2·6	5·3	934	55	·059	− 91·1	2530·8	2530·8	2525	3·0
Jan. 4,5,6	2 29	XXXIX (Koramúr)	D 0 3 38·7	12	2·7	5·3								
„ 11,12	1 46	XXXVIII (Dindĕmane)	D 0 1 26·2	12	2·7	5·3	1042	64	·061	+ 192·6	2531·2			
„ 5,6	1 47	XXXIX (Koramúr)	D 0 13 59·5	16	2·7	5·3								
Dec. 10,12,13	3 0	XXXIV (Chandragutti)	D 0 7 54·4	12	2·8	5·3	1020	65	·064	− 12·2	2778·9			
Jan. 1,2	3 0	XL (Hŏnnavalli)	D 0 7 6·3	12	2·6	5·3								
„ 5,6	2 15	XXXIX (Koramúr)	E 0 2 53·5	16	2·7	5·3	890	53	·060	+ 249·5	2780·3	2779·6	2777	4·6
„ 1,2	2 14	XL (Hŏnnavalli)	D 0 16 9·3	12	2·7	5·3								
„ 5,6	3 0	XXXIX (Koramúr)	E 0 3 9·9	12	2·6	5·3	1136	71	·063	+ 385·2	2916·0			
„ 24,25	2 59	XLI (Hugadi)	D 0 19 53·3	12	2·6	5·3								
„ 1,2	2 31	XL (Hŏnnavalli)	D 0 6 26·2	12	2·7	5·3	1337	80	·060	+ 135·3	2914·9	2915·8	2912	3·8
„ 24,25	2 29	XLI (Hugadi)	D 0 13 19·0	12	2·6	5·3								
„ 17,18,19	2 15	XLII (Kŏdashádri)	D 0 52 25·7	12	2·7	5·3	1156	70	·061	−1492·4	2916·5			
„ 24,25	2 14	XLI (Hugadi)	E 0 35 21·0	12	2·8	5·3								
„ 11,12	2 29	XXXVIII (Dindĕmane)	E 0 49 46·7	12	2·8	5·3	1200	74	·061	+2069·5	4408·1			
„ 17,18,19	2 30	XLII (Kŏdashádri)	D 1 7 27·9	12	2·8	5·3								
„ 5,6	2 1	XXXIX (Koramúr)	E 0 51 50·6	12	2·8	5·3	1067	60	·056	+1878·8	4409·6	4408·5	4405	2·5
„ 17,18,19	2 0	XLII (Kŏdashádri)	D 1 7 47·6	12	2·7	5·3								
„ 24,25	2 14	XLI (Hugadi)	E 0 35 21·0	12	2·8	5·3	1156	70	·061	+1492·4	4407·9			
„ 17,18,19	2 15	XLII (Kŏdashádri)	D 0 52 25·7	12	2·7	5·3								
„ 24,25	2 44	XLI (Hugadi)	D 0 26 53·5	12	2·6	5·3	783	46	·059	− 484·2	2431·6			
„ 27,28,29	2 46	XLIII (Siddeshvar)	E 0 15 4·0	16	0·9	5·3								
„ 17,18,19	1 46	XLII (Kŏdashádri)	D 0 58 15·7	20	2·7	5·3	1397	89	·064	−1974·1	2434·4	2433·4	2429	2·3
„ 27,28,29	1 49	XLIII (Siddeshvar)	E 0 37 49·0	16	2·8	5·3								
Feb. 1,2	2 31	XLIV (Bisale)	D 0 24 34·0	16	2·6	5·3	774	42	·054	− 425·8	2434·1			
Jan. 27,28,29,30	2 21	XLIII (Siddeshvar)	E 0 12 48·5	20	2·6	5·3								
„ 24,25	1 58	XLI (Hugadi)	D 0 11 7·1	12	2·7	5·3	1296	76	·059	− 57·7	2858·1			
Feb. 1,2	2 0	XLIV (Bisale)	D 0 8 5·6	16	2·6	5·3								
Jan. 17,19	2 47	XLII (Kŏdashádri)	D 0 53 21·3	16	2·7	5·3	1169	86	·073	−1546·8	2861·7	2859·5	2855	1·9
Feb. 2	2 46	XLIV (Bisale)	E 0 36 34·6	12	2·8	5·3								
Jan. 27,28,29,30	2 21	XLIII (Siddeshvar)	E 0 12 48·5	20	2·6	5·3	774	42	·054	+ 425·8	2858·8			
Feb. 1,2	2 31	XLIV (Bisale)	D 0 24 34·0	16	2·6	5·3								
Jan. 28,29,30	2 58	XLIII (Siddeshvar)	E 0 29 44·5	16	2·6	5·3	1202	73	·060	+1366·5	3799·9			
Feb. 16,18,19	3 0	XLV (Hirĕgudda)	D 0 47 31·0	16	2·6	5·3								
„ 1,2	2 38	XLIV (Bisale)	E 0 11 37·1	16	2·6	5·3	1436	86	·060	+ 938·4	3797·9	3798·9	3794	1·9
„ 16,18,19	2 34	XLV (Hirĕgudda)	D 0 32 48·3	16	2·7	5·3								

Astronomical Date 1873	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″	′						feet
Jan. 28,29,30	2 30	XLIII (Siddeshvar)	E 0 36 55·7	16	2·8	5·3	1404	92	·065	+1947·8	4381·2			
Mar. 13, 14	2 54	XLVI (Hĕbbe)	D 0 57 17·9	12	6·3	5·3						4381·9	4377	1·0
Feb. 16,17,19	1 57	XLV (Hirĕgudda)	E 0 18 10·5	16	2·6	5·3	818	52	·063	+ 583·7	4382·6			
Mar. 13, 14	1 56	XLVI (Hĕbbe)	D 0 30 10·0	12	6·2	5·3								
Feb. 1, 2	3 0	XLIV (Bisale)	E 0 15 39·1	12	2·6	5·3	852	51	·060	+ 551·9	3411·4			
„ 8, 9	2 56	XLVII (Valkunji)	D 0 28 21·5	12	2·7	5·3						3412·6	3408	1·4
„ 16,17,18,19	1 48	XLV (Hirĕgudda)	D 0 19 54·0	20	2·7	5·3	1169	67	·057	− 385·1	3413·8			
„ 8, 9	1 43	XLVII (Valkunji)	E 0 2 29·9	12	2·6	5·3								
„ 16,18,19	2 14	XLV (Hirĕgudda)	E 1 6 8·2	16	2·7	5·3	1102	58	·052	+2415·3	6214·2			
(1)	2 17	III (Kudurĕmukha)	D 1 22 45·0	24	2·7	5·3								
Feb. 9	2 30	XLVII (Valkunji)	E 1 26 39·7	12	2·7	5·3	1009	53	·053	+2799·4	6212·0	6213·4	6207	1·2
1872 Apr. 19, 20	3 17	III (Kudurĕmukha)	D 1 41 53·3	12	2·7	5·3								
1873 Mar. 7	1 40	VI (Ánúr)	E 0 18 30·1	8	2·7	5·3	1517	92	·061	+1324·8	6214·1			
(2)	1 44	III (Kudurĕmukha)	D 0 40 50·0	12	2·8	5·3								
Feb. 16,18,19	2 43	XLV (Hirĕgudda)	E 0 32 30·9	16	2·8	5·3	939	58	·061	+1091·3	4890·2			
Mar. 7	2 41	VI (Ánúr)	D 0 46 19·2	8	6·2	5·3								
„ 13, 14	2 15	XLVI (Hĕbbe)	E 0 13 58·3	12	2·8	5·3	843	42	·049	+ 506·4	4888·3	4888·9	4885	2·2
„ 7	2 14	VI (Ánúr)	D 0 26 50·7	8	2·8	5·3								
(2)	1 44	III (Kudurĕmukha)	D 0 40 50·0	12	2·8	5·3	1517	92	·061	−1324·8	4888·3			
Mar. 7	1 40	VI (Ánúr)	E 0 18 30·1	8	2·7	5·3								

NOTE.—Stations III (Kudurĕmukha) and VI (Ánúr) appertain to the Madras Longitudinal Series.
(1) The mean of observations taken on 20th, 23rd and 28th April, 1872, and 25th and 26th February, 1873.
(2) Do. do. 23rd April, 1872, and 26th February, 1873.

Description of Spirit-levelled Points.

When determining the Spirit-levelled heights, given on pages 74—D. to 78—D., the levelling staff stood on the surfaces hereafter described.

XVII (Kem)	On a peg at the foot of the station, height = 1945·89 feet. To this value 5·32 feet (the height of the mark-stone in the upper surface of the circular pillar above this peg) being added, the height of the upper mark-stone was found to be 1951·21 feet.
XIX (Alsunda)	On a peg at the foot of the station, height = 2157·99 feet. To this value 7·22 feet (the height of the upper surface of the rectangular protecting pillar above this peg) being added, the height of the top of the protecting pillar was found to be 2165·21 feet.
XXII (Bori)	On a peg at the foot of the station, height = 1997·90 feet. To this value 7·24 feet (the height of the mark-stone in the upper surface of the rectangular protecting pillar above this peg) being added, the height of the mark-stone on the protecting pillar was found to be 2005·14 feet.
I (Kalas)	On a peg at the foot of the station, height = 2000·66 feet. To this value 7·30 feet (the height of the upper surface of the circular pillar above this peg) being added, the height of the upper surface of the pillar was found to be 2007·96 feet.
VI (Aundh)	On a peg at the foot of the station, height = 3127·85 feet. To this value 6·34 feet (the height of the upper surface of the rectangular protecting pillar above this peg) being added, the height of the upper surface of the protecting pillar was found to be 3134·19 feet.
XXVII (Kundgol)	On the mark-stone in the upper surface of the circular pillar.

For further particulars of these stations, see pages 3—D. to 8—D.

NOTE.—Stations XVII (Kem), XIX (Alsunda) and XXII (Bori) appertain to the Bombay Longitudinal Series.

September, 1889.

W. H. COLE,
In charge of Computing Office.

MANGALORE MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION. AZIMUTHAL OBSERVATIONS.

At IV (Páchvad)

Lat. N. 17° 31′ 1″·97; Long. E. 74° 42′ 10″·89 = 4ʰ 58ᵐ 48ˢ·7; Height above Mean Sea Level, 3138 feet.
March 1865; observed by Captain C. T. Haig, R.E., with Barrow's 24-inch Theodolite No. 2.

Star observed	α Ursæ Minoris (West).
Mean Right Ascension 1865·0	$1^h\ 9^m\ 38^s$
Mean North Polar Distance 1865·0	1° 24′ 36″·85
Local Mean Time of Elongation, March 5	Western $8^h\ 14^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 5	W.	180 0	+151 32 11·38	2 34	+ 0 0·33	+151 32 11·71	+151 32 3·64	13 12	+ 0 8·80	+151 32 12·44
		&	32 11·68	0 6	0 0·00	11·68	32 7·40	10 8	0 5·19	12·59
		0 0	31 59·10	15 36	0 12·27	11·37	32 7·98	6 57	0 2·44	10·42
			31 55·26	17 44	0 15·87	11·13	32 7·16	9 8	0 4·21	11·37
„ 6	W.	223 12	+151 31 57·14	17 45	+ 0 15·92	+151 32 13·06	+151 32 8·48	7 30	+ 0 2·85	+151 32 11·33
		&	31 59·62	15 25	0 12·00	11·62	32 9·98	4 58	0 1·25	11·23
		43 12	32 12·40	4 33	0 1·05	13·45	32 0·04	15 30	0 12·13	12·17
			32 9·28	7 19	0 2·70	11·98	31 55·46	18 31	0 17·28	12·74
„ 7	W.	266 24	+151 32 11·20	0 14	+ 0 0·00	+151 32 11·20	+151 32 5·42	11 33	+ 0 6·74	+151 32 12·16
		&	32 11·80	1 49	0 0·17	11·97	32 6·86	8 29	0 3·64	10·50
		86 24	31 50·30	21 17	0 22·85	13·15	32 7·60	9 47	0 4·84	12·44
			31 44·28	23 22	0 27·55	11·83	32 5·28	11 41	0 6·89	12·17
„ 8	W.	352 48	+151 32 10·72	4 43	+ 0 1·13	+151 32 11·85	+151 31 53·24	19 10	+ 0 18·55	+151 32 11·79
		&	32 12·40	2 3	0 0·21	12·61	31 58·30	16 2	0 12·99	11·29
		172 48	32 4·16	13 33	0 9·28	13·44	32 10·50	3 58	0 0·79	11·29
			31 58·94	17 20	0 15·16	14·10	32 10·80	6 0	0 1·82	12·62
„ 9	W.	309 36	+151 31 42·48	24 25	+ 0 30·13	+151 32 12·61	+151 32 1·66	15 39	+ 0 12·37	+151 32 14·03
		&	31 49·20	21 32	0 23·42	12·62	32 5·12	12 53	0 8·38	13·50
		129 36	32 12·78	3 41	0 0·69	13·47	32 11·94	6 55	0 2·42	14·36
			32 13·78	1 5	0 0·06	13·84	32 8·58	8 48	0 3·91	12·49

Abstract of Astronomical Azimuth observed at IV (Páchvad) 1865.

By Western Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	223°	43°	266°	86°	310°	130°	353°	173°
Date	March 5		March 6		March 7		March 9		March 8	
	"	"	"	"	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	11·71	12·44	13·06	11·33	11·20	12·16	12·61	14·03	11·85	11·79
	11·68	12·59	11·62	11·23	11·97	10·50	12·62	13·50	12·61	11·29
	11·37	10·42	13·45	12·17	13·15	12·44	13·47	14·36	13·44	11·29
	11·13	11·37	11·98	12·74	11·83	12·17	13·84	12·49	14·10	12·62
Means	11·47	11·71	12·53	11·87	12·04	11·82	13·13	13·60	13·00	11·75

	° ′ ″	″	″	″	″
Means of both faces	+ 151 32 11·59	12·20	11·93	13·36	12·38
Level Corrections	− 0·28	+ 0·28	− 0·08	+ 0·03	− 0·17
Corrected Means	+ 151 32 11·31	12·48	11·85	13·39	12·21
Az. of Star fr. S., by W.	178 31 32·22	32·01	31·70	31·17	31·49
Az. of Ref. M. „	330 3 43·53	44·49	43·55	44·56	43·70

		°	′	″
Astronomical Azimuth of Referring Mark by Western Elongation		330	3	43·97
Angle Referring Mark and VII (Palsi) *see page* 15—D. *ante*	+	1	8	43·10
Astronomical Azimuth of Palsi by observation		331	12	27·07
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 70—D. *ante*		331	12	32·32
Astronomical — Geodetical Azimuth at IV (Páchvad)	−			5·25

At XV (Karabgati)

Lat. N. 16° 7′ 34″·87; Long. E. 74° 50′ 23″·53 = 4^h 59^m 21^s·6; Height above Mean Sea Level, 2544 feet.
December 1865; observed by Captain C. T. Haig, R. E., with Barrow's 24-inch Theodolite No. 2.

Star observed	δ Ursæ Minoris (West and East).
Mean Right Ascension 1865·0	18^h 15^m 54^s
Mean North Polar Distance 1865·0	3° 23′ 45″·67
Local Mean Times of Elongation, December 23	Western 6^h 3^m Eastern 18 9

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 23	W.	180 0	− 27 37 33·08	5 1	+ 0 3·04	− 27 37 30·04	− 27 37 59·92	15 6	+ 0 27·57	− 27 37 32·35
		&	37 35·22	7 15	0 6·35	28·87	37 50·68	13 43	0 22·74	27·94
		0 0					37 35·96	6 29	0 5·08	30·88
							37 32·28	3 41	0 1·64	30·64
							37 53·48	13 42	0 22·65	30·83
							37 58·02	15 8	0 27·59	30·43
„ 23	E.	180 0	− 34 41 17·52	2 34	− 0 0·80	− 34 41 18·32	− 34 41 7·14	10 9	− 0 12·43	− 34 41 19·57
		&	40 23·80	21 19	0 54·95	18·75	40 58·36	12 44	0 19·59	17·95
		0 0	40 10·08	23 26	1 6·35	16·43				
„ 24	E.	223 12	− 34 41 17·56	5 35	− 0 3·75	− 34 41 21·31	− 34 40 43·54	16 48	− 0 34·05	− 34 41 17·59
		&	41 17·72	2 59	0 1·08	18·80	40 52·56	13 48	0 22·96	15·52
		43 13	40 41·12	17 44	0 38·02	19·14	41 15·18	4 44	0 2·71	17·89
			40 26·30	21 19	0 54·90	21·20	41 10·64	7 23	0 6·57	17·21
„ 25	W.	223 12	− 27 38 1·60	16 45	+ 0 33·89	− 27 37 27·71	− 27 37 32·60	7 18	+ 0 6·44	− 27 37 26·16
		&	37 53·22	14 18	0 24·73	28·49	37 29·88	5 22	0 3·48	26·40
		43 12	37 41·70	9 55	0 11·85	29·85	37 26·70	2 13	0 0·60	26·10
			37 46·36	12 9	0 17·84	28·52	37 25·74	0 57	0 0·11	25·63
„ 25	E.	266 24	− 34 40 55·40	13 47	− 0 22·90	− 34 41 18·30	− 34 39 59·28	25 21	− 1 17·36	− 34 41 16·64
		&	41 3·10	11 19	0 15·43	18·53	40 16·70	22 23	1 0·38	17·08
		86 24	41 13·88	6 50	0 5·65	19·53	41 14·90	3 9	0 1·21	16·11
			41 10·44	9 12	0 10·22	20·66	41 16·92	0 36	0 0·04	16·96
							40 44·72	16 20	0 32·23	16·95
							40 35·38	18 36	0 41·83	17·21
„ 26	W.	266 24	− 27 37 29·18	2 8	+ 0 0·55	− 27 37 28·63	− 27 37 45·06	12 20	+ 0 18·40	− 27 37 26·66
		&	37 28·32	0 3	0 0·00	28·32	37 37·30	9 38	0 11·22	26·08
		86 24	38 3·60	16 40	0 33·49	30·11	37 34·06	8 19	0 8·34	25·72
			38 6·50	17 52	0 38·50	28·00	37 43·04	11 35	0 16·20	26·84

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 26	E.	309 36	− 34 41 13·40	7 25	− 0 6·65	− 34 41 20·05	− 34 40 39·04	17 54	− 0 38·63	− 34 41 17·67
		&	41 16·64	4 44	0 2·70	19·34	40 54·20	14 32	0 25·50	19·70
		129 36	40 31·14	19 47	0 47·30	18·44	41 13·08	6 44	0 5·48	18·56
			40 20·42	22 3	0 58·80	19·22	41 8·12	9 11	0 10·20	18·32
„ 27	E.	352 48	− 34 41 12·62	7 24	− 0 6·62	− 34 41 19·24	− 34 40 40·84	17 5	− 0 35·17	− 34 41 16·01
		&	41 15·80	5 54	0 4·20	20·00	40 50·30	14 28	0 25·26	15·56
		172 48	41 0·80	12 28	0 18·78	19·58	41 16·50	1 38	0 0·32	16·82
			40 55·46	14 25	0 25·13	20·59	41 13·60	3 45	0 1·69	15·29
„ 28	W.	352 48	− 27 37 31·98	4 44	+ 0 2·71	− 27 37 29·27	− 27 37 33·70	6 33	+ 0 5·17	− 27 37 28·53
		&	37 34·14	7 23	0 6·57	27·57	37 27·98	3 16	0 1·29	26·69
		172 48	39 15·32	29 50	1 47·14	28·18	37 52·58	14 52	0 26·65	25·93
			39 33·40	32 18	2 5·45	27·95	37 57·44	16 27	0 32·64	24·80
„ 29	W.	180 0	− 27 39 9·32	28 48	+ 1 39·82	− 27 37 29·50				
			39 24·66	31 0	1 55·66	29·00				

Abstract of Astronomical Azimuth observed at XV (Karabgati) 1865.

1. By Eastern Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	223°	43°	266°	86°	310°	130°	353°	173°
Date	December 23		December 24		December 25		December 26		December 27	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. − Star reduced to Elongation	18·32	19·57	21·31	17·59	18·30	16·64	20·05	17·67	19·24	16·01
	18·75	17·95	18·80	15·52	18·53	17·08	19·34	19·70	20·00	15·56
	16·43		19·14	17·89	19·53	16·11	18·44	18·56	19·58	16·82
			21·20	17·21	20·66	16·96	19·22	18·32	20·59	15·29
						16·95				
						17·21				
Means	17·83	18·76	20·11	17·05	19·26	16·82	19·26	18·56	19·85	15·92
	° ′ ″		″		″		″		″	
Means of both faces	− 34 41 18·30		18·58		18·04		18·91		17·88	
Level Corrections	− 0·57		+ 0·26		− 0·53		+ 0·05		− 0·87	
Corrected Means	− 34 41 18·87		18·32		18·57		18·86		18·75	
Az. of Star fr. S., by W.	183 31 55·12		55·53		55·85		56·16		56·47	
Az. of Ref. M. „	148 50 36·25		37·21		37·28		37·30		37·72	

Abstract of Astronomical Azimuth observed at XV (Karabgati) 1865—(*Continued*).

2. By Western Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	223°	43°	266°	86°	310°†	130°†	353°	173°
Date	Dec. 23		Dec. 25		Dec. 26		...		Dec. 28	
	"	"	"	"	"	"			"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	30·04 28·87 *31·58 *31·08	32·35 27·94 30·88 30·64 30·83 30·43	27·71 28·49 29·85 28·52	26·16 26·40 26·10 25·63	28·63 28·32 30·11 28·00	26·66 26·08 25·72 26·84	No observations		29·27 27·57 28·18 27·95	28·53 26·69 25·93 24·80
Means	30·39	30·51	28·64	26·07	28·77	26·32	...	...	28·24	26·49
	° ′ ″		″		″				″	
Means of both faces	— 27 37 30·45		27·36		27·54				27·36	
Level Corrections	+ 0·63		+ 0·17		+ 0·77				+ 0·29	
Corrected Means	— 27 37 29·82		27·19		26·77		...		27·07	
Az. of Star fr. S., by W.	176 28 5·09		4·36		4·05				3·42	
Az. of Ref. M. „	148 50 35·27		37·17		37·28				36·35	

				°	′	″
Astronomical Azimuth of Referring Mark ...	by Eastern Elongation	...	...	148	50	37·15
	by Western „	...	...		„	36·52
	Mean	...	...		„	36·84
Angle Referring Mark and XIII (Mávinhúnda) *see page* 22—D. *ante*		...	...	+ 30	18	47·72
Astronomical Azimuth of Mávinhúnda by observation	...	...	...	179	9	24·56
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 71—D. *ante*		...	...	179	9	29·86
Astronomical — Geodetical Azimuth at XV (Karabgati) ...	...	...	...	—		5·30

NOTE.—Where observations occurred on the same pair of zeros on different nights they are reduced in this abstract to one date—the most convenient—by allowing for star's change of place. The date so adopted appears at the head of the column, and the reduced observation is preceded by an asterisk.
† No observations taken on the zeros 310° and 130° in the case of western elongation.

At XXXIX (Koramúr)

Lat. N. 14° 8′ 6″·59; Long. E. 75° 0′ 51″·25 = 5ʰ 0ᵐ 3ˢ·4; Height above Mean Sea Level, 2525 feet.
March 1873; observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms' 24-inch Theodolite No. 1.

Star observed		*a* Ursæ Minoris (West).
Mean Right Ascension 1873·0		$1^h\ 12^m\ 18^s$
Mean North Polar Distance 1873·0		1° 22′ 4″·30
Local Mean Time of Elongation, March 23	Western	$7^h\ 5^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 23	W.	180 1	+ 56 52 35·74	5 58	+ 0 1·72	+ 56 52 37·46	+ 56 52 35·69	4 32	+ 0 0·99	+ 56 52 36·68
		&	52 38·96	1 14	0 0·07	39·03	52 30·88	11 32	0 6·42	37·30
		0 1	52 27·35	15 19	0 11·32	38·67	52 9·29	24 27	0 28·81	38·10
			52 19·04	21 2	0 21·33	40·37	51 53·86	29 29	0 41·87	35·73
„ 24	W.	259 13	+ 56 52 31·43	12 12	+ 0 7·03	+ 56 52 38·46	+ 56 52 13·15	22 52	+ 0 25·25	+ 56 52 38·40
		&	52 35·48	9 47	0 4·62	40·10	52 20·42	19 43	0 18·77	39·19
		79 13	52 37·00	7 13	0 2·51	39·51	52 38·62	2 48	0 0·38	39·00
			52 34·79	9 27	0 4·30	39·09	52 37·01	0 13	0 0·00	37·01
„ 25	W.	338 25	+ 56 52 34·52	11 5	+ 0 5·92	+ 56 52 40·44	+ 56 52 19·38	20 28	+ 0 20·20	+ 56 52 39·58
		&	52 33·77	9 1	0 3·92	37·69	52 23·47	17 55	0 15·48	38·95
		158 25	52 38·02	8 32	0 3·52	41·54	52 38·64	1 53	0 0·17	38·81
			52 36·16	10 48	0 5·64	41·80	52 39·47	0 59	0 0·05	39·52
„ 26	W.	57 37	+ 56 52 40·50	3 58	+ 0 0·76	+ 56 52 41·26	+ 56 52 29·74	13 38	+ 0 8·97	+ 56 52 38·71
		&	52 39·20	2 19	0 0·26	39·46	53 32·68	11 10	0 6·01	38·69
		237 37								
			+ 56 52 35·30	10 15	+ 0 5·08	+ 56 52 40·38	+ 56 52 20·44	19 51	+ 0 19·03	+ 56 52 39·47
			52 38·89	6 50	0 2·26	41·15	52 21·96	17 45	0 15·22	37·18
„ 27	W.	136 49	52 33·26	13 36	0 8·92	42·18	52 37·87	4 14	0 0·86	38·73
		&	52 29·78	15 34	0 11·68	41·46	52 38·00	6 33	0 2·07	40·07
		316 49	52 14·75	24 1	0 27·79	42·54	52 17·58	21 30	0 22·28	39·86
			51 59·78	29 44	0 42·57	42·35	51 49·46	32 23	0 50·49	39·95

Abstract of Astronomical Azimuth observed at XXXIX (Koramúr) 1873.

By Western Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	March 23		March 24		March 25		March 26		March 27	
	"	"	"	"	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	37·46	36·68	38·46	38·40	40·44	39·58	41·26	38·71	40·38	39·47
	39·03	37·30	40·10	39·19	37·69	38·95	39·46	38·69	41·15	37·18
	38·67	38·10	39·51	39·00	41·54	38·81			42·18	38·73
	40·37	35·73	39·09	37·01	41·80	39·52			41·46	40·07
									42·54	39·86
									42·35	39·95
Means	38·88	36·95	39·29	38·40	40·37	39·22	40·36	38·70	41·68	39·21

	March 23	March 24	March 25	March 26	March 27
	° ′ ″	″	″	″	″
Means of both faces	+ 56 52 37·92	38·85	39·79	39·53	40·44
Level Corrections	+ 1·29	+ 0·70	− 0·07	+ 0·17	+ 0·66
Corrected Means	+ 56 52 39·21	39·55	39·72	39·70	41·10
Az. of Star fr. S., by W.	178 35 27·26	26·95	26·64	26·33	26·02
Az. of Ref. M. „	235 28 6·47	6·50	6·36	6·03	7·12

	°	′	″
Astronomical Azimuth of Referring Mark or XL (Hŏnnavalli) { by Western Elongation	235	28	6·50
Geodetical Azimuth of Hŏnnavalli by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 72—D. *ante*	235	28	13·26
Astronomical — Geodetical Azimuth at XXXIX (Koramúr)	−		6·76

October, 1889.

W. H. COLE,
In charge of Computing Office.

PLATE 1.

PRINCIPAL TRIANGULATION—MANGALORE MERIDIONAL SERIES

Fig. No. 29

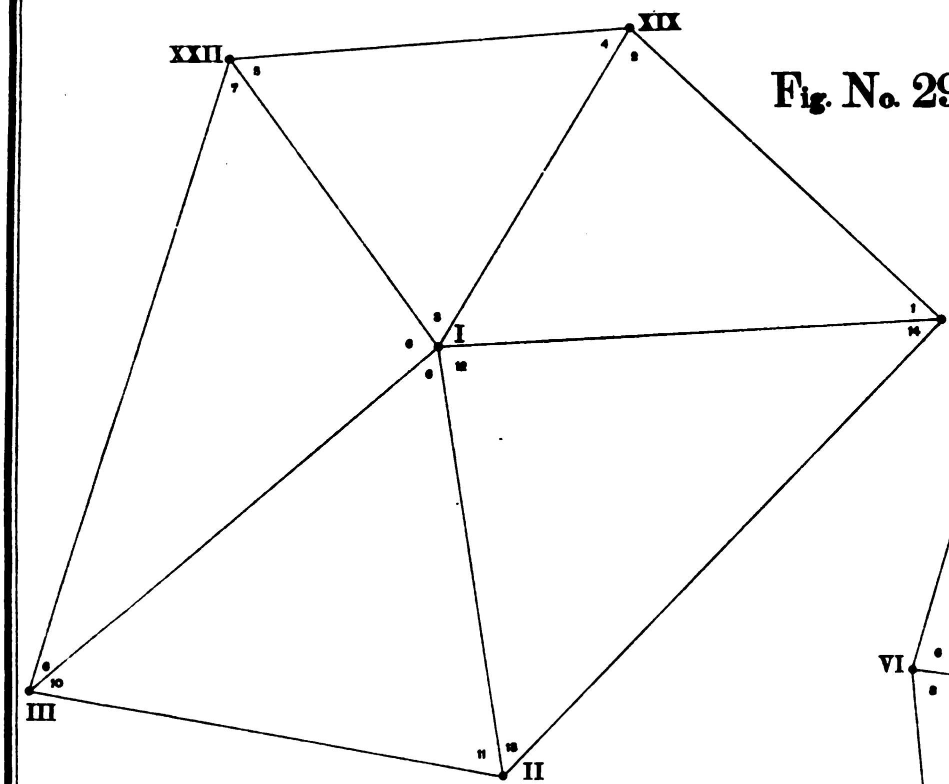


Fig. No. 30

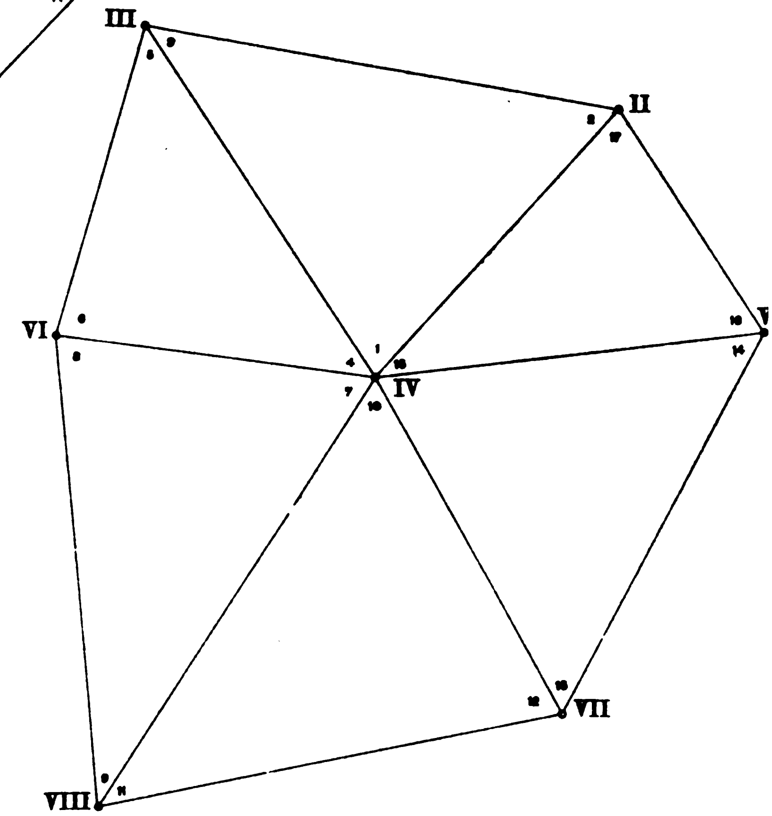


Fig. No. 31

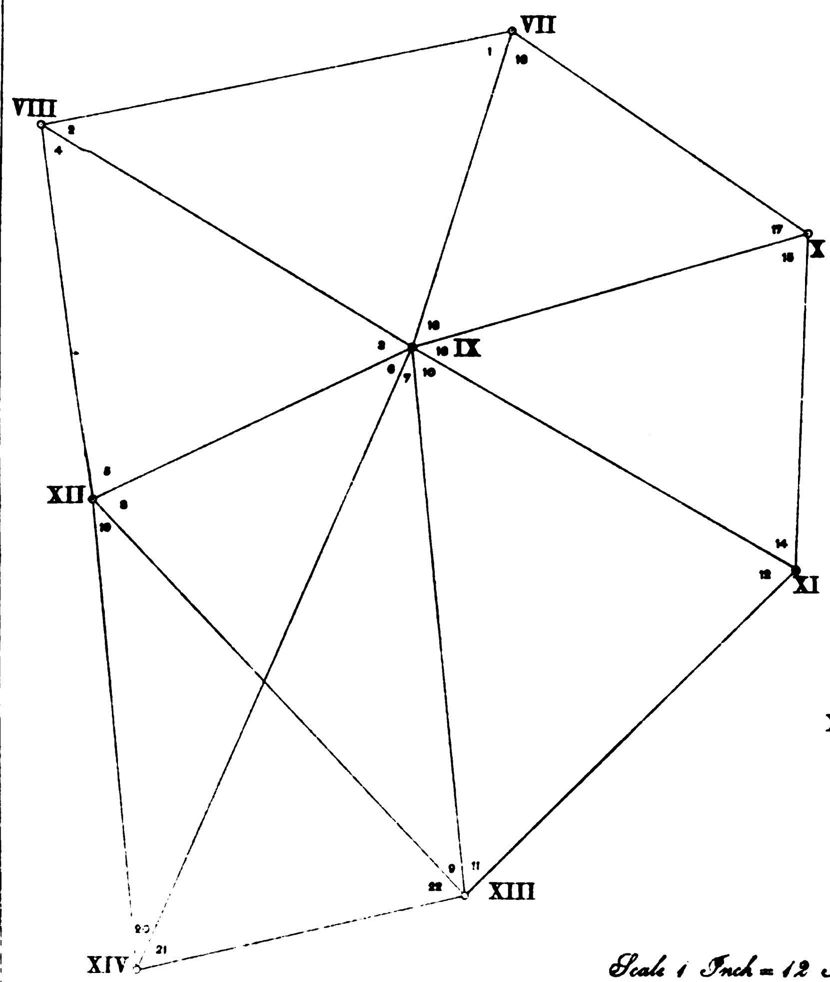
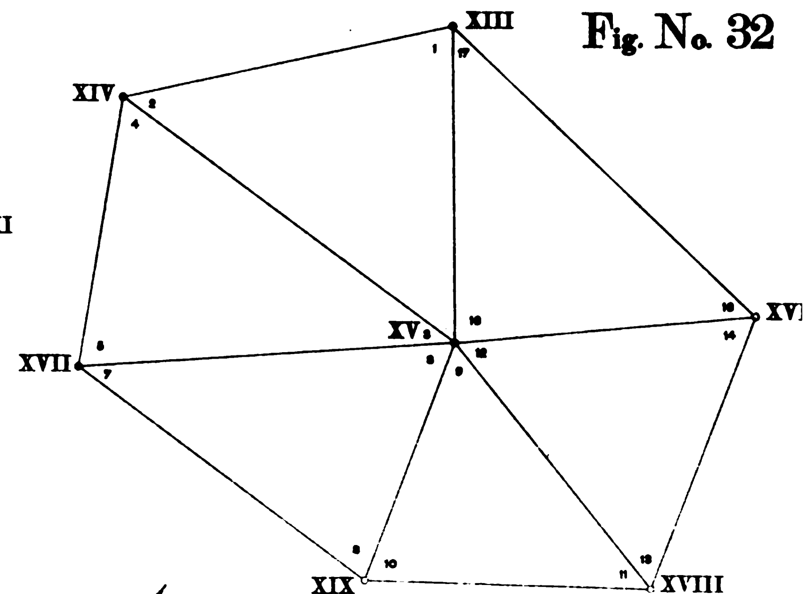


Fig. No. 32



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, July 1888.

PRINCIPAL TRIANGULATION—MANGALORE MERIDIONAL SERIES.

Fig. No. 33

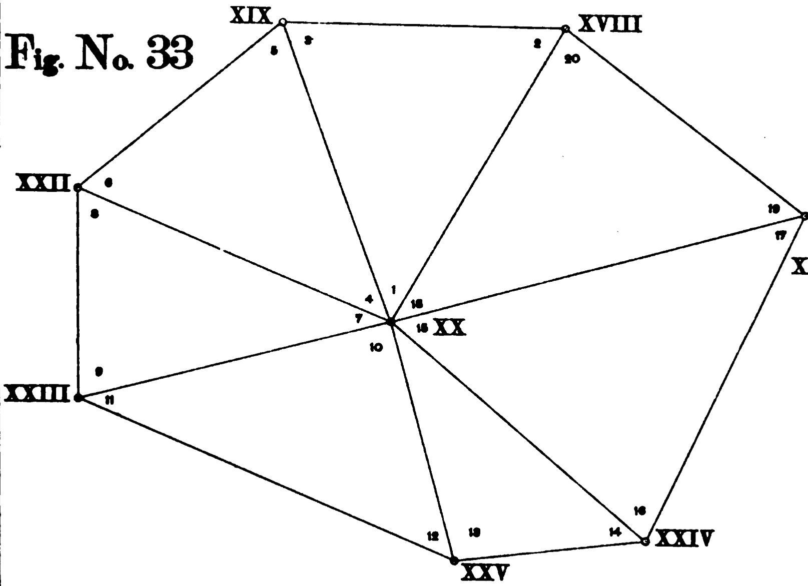


Fig. No. 34

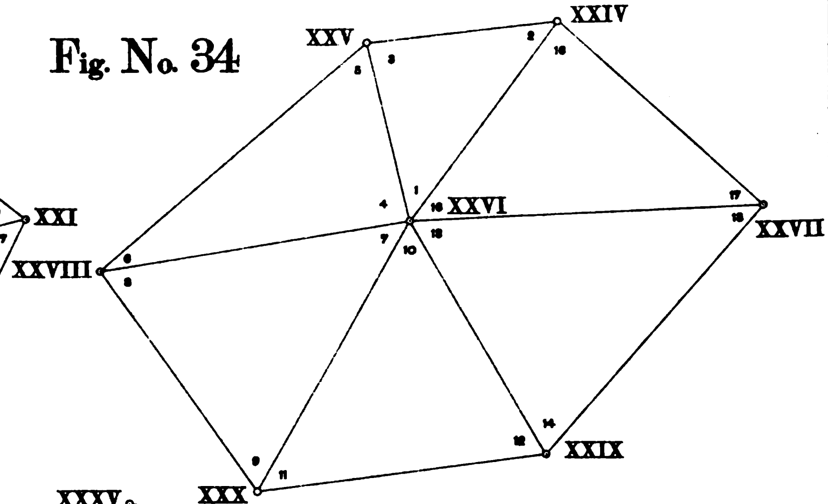


Fig. No. 35

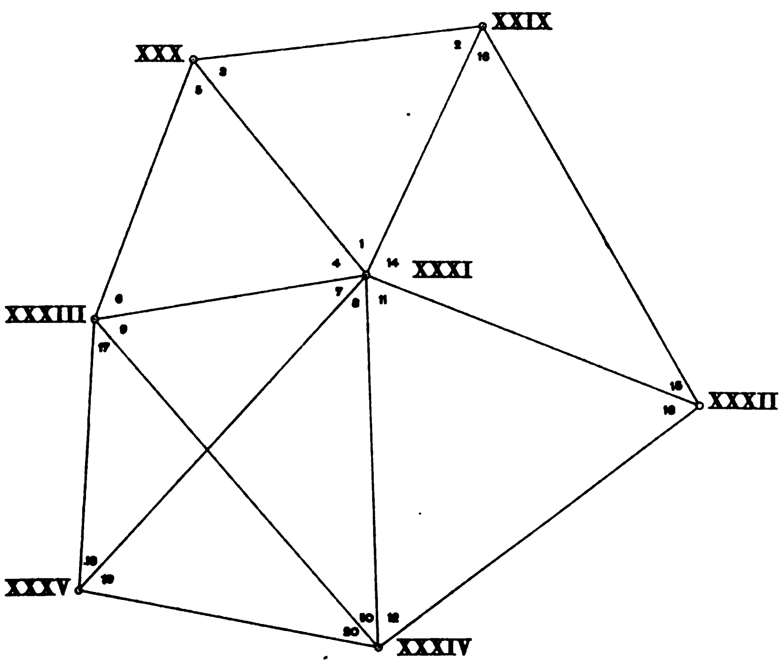


Fig. No. 36

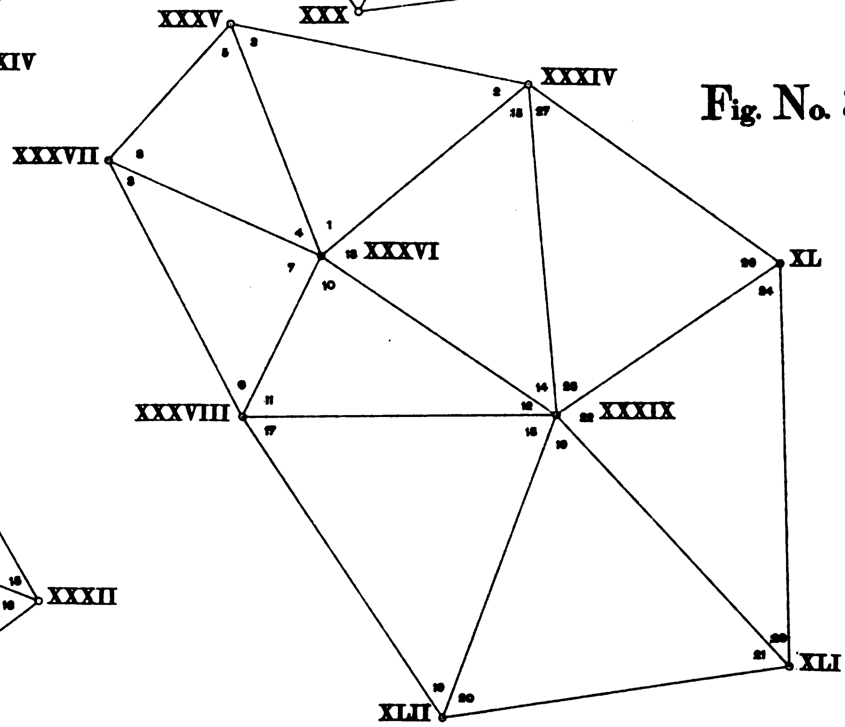


Fig. No. 37

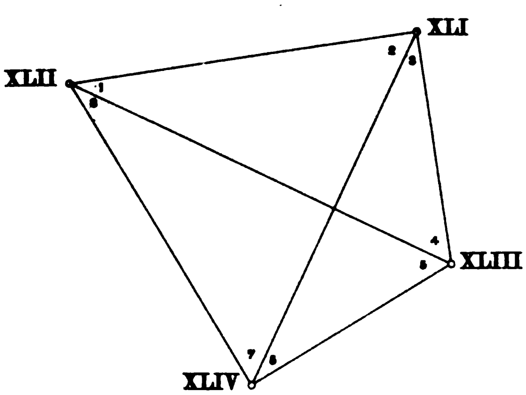
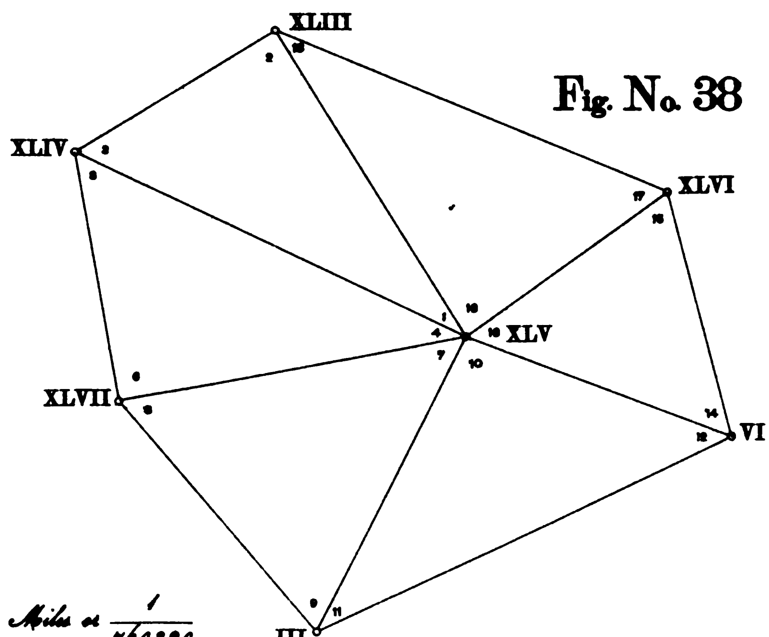


Fig. No. 38



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, March 1888.

MADRAS MERIDIONAL AND COAST SERIES.

MADRAS MERIDIONAL AND COAST SERIES.

INTRODUCTION.

The Madras Meridional and Coast Series is the name of the great chain of principal triangles connecting Vizagapatam (Vishakhapatnam) and Madras. It follows the line of the eastern coast of India between the parallels of 17° 30′ and 13°, and its initial and terminal sides belong respectively to the two longitudinal series of Bider (Bidar) and Madras. From Vizagapatam the series runs W.S.W., till, in latitude 16° 30′, it meets the meridian of 80°; it then follows this meridian to Madras. The Jubbulpore (Jabalpur) Meridional Series, which follows the line of this meridian southwards to the parallel of 18°, was produced to meet the series under review at the angle formed by this change of direction, and a great meridional chain was thus completed connecting Madras with the Calcutta Longitudinal Series. The small portion of this meridional chain that is intercepted between the Bider Longitudinal and the Madras Meridional and Coast Series, was, for purposes of reduction, attached to the latter, which therefore emanates from two distinct sides of the former and with it forms a complete circuit of triangulation.

The whole country between Madras and the Kistna (Krishna) River had been covered with a net-work of principal triangles by Colonel Lambton in the first quarter of the century, and a base-line had been measured by him at Guntúr in 1812. In the last two years of his life, he had despatched Captain (afterwards Sir George) Everest, R.A., and Mr. J. De Penning to carry the triangulation eastwards from Hyderabad to the meridian of 80° and thence north to the Godávari river; but though he had fully planned its extension through the Circars (Sarkárs) to meet the requirements of Colonel McKenzie, then Surveyor General of India, the project fell through and no points were fixed near the coast north of the Kistna. With the exception therefore of the north-eastern branch which runs along the coast from the Kistna, the whole of the present series lay over ground that had been entirely covered with principal triangulation during the first period of the trigonometrical surveys. Owing to the inferiority of his instruments, when compared with those now in use, to the great errors that his base-lines were liable to, and to the complete obliteration of many of his stations, Colonel Lambton's work has not been incorporated with the *principal* triangulation, but with the *secondary* operations of recent times.

Seasons 1860-61, *and* 1861-62.

PERSONNEL.

Captain J. P. Basevi, R.E., 1st Assistant.
R. Clarkson, Esq., Civil Assistant.
Mr. G. B. Howard, Sub-Assistant, 1st Class.
" J. Ellison, " 1st "
" F. Ryall, " 2nd "

The Madras Meridional and Coast Series was commenced in 1860. A party under various officers, and latterly under Major A. Strange of the Madras Cavalry, had been for some years carrying a series down the East Coast from Calcutta, and by the end of the field season of 1859-60 had completed the Nalákŏnda–Pothkŏnda polygon, which now forms the most eastern figure of the Bider Longitudinal Series: from the southern side of this figure one branch of the series under review emanates. Major Strange, hitherto a Brevet-Major only, having now attained his Regimental Majority, relinquished his appointment in the Survey Department and reverted to military duty, and the charge of the party was transferred to Captain Basevi in the autumn of 1860, the exigencies of the Department having required his transfer from the Trans-Indus frontier all the way to the Madras coast. He commenced operations from the side Sánjib–Dhár of the Bider Longitudinal Series, and was proceeding towards Rajahmundry (Rájamahendravaram) when, on approaching the hill of Kappa in the Rampa estate, he found that his signallers had been driven away from the hill with threats of violence, and that the inhabitants of the district were assembling to prevent him too from ascending. The estate was rent-free, and the people, though under the control of the Godávari magistracy, were a lawless set. Captain Basevi, having obtained an extra military guard and a body of police, made his way to the summit of the hill without molestation, and took the necessary observations. One day the people set fire to the long grass on the hill, and a Rája brought intelligence that they were collecting to attack the surveyors; but the fire was extinguished and the attack was not attempted. Captain Basevi's chief apprehensions were for the signallers, whom he had to leave behind at the station; but a guard was left with them, and they were not molested. The only serious inconvenience occasioned was in having to construct the station on a block of laterite several feet below the summit of the hill; for it was covered with dense jungle, which there was no means of clearing away without the assistance of the villagers, who had all absconded. The operations proceeded without further opposition or hindrance, excepting from the physical difficulties of the ground passed over. The district between the Godávari and Kistna rivers was crossed with considerable trouble, owing to the absence of high hills and the undulating nature of the ground, which was rendered all the more difficult through being covered with dense jungle. Thus the selection of stations, in such a manner as to form an unbroken chain of quadrilaterals and polygons, became a very tedious and laborious undertaking, involving the repeated rejection of positions which at first promised the requisite visibility in all directions, but which were afterwards found to be deficient in some essential relation. By June 1861, the final observations were completed to the side Parampúdi–Sudkŏnda; the figures embraced being 2 hexagons, 1 pentagon and 1 quadrilateral, containing 20 triangles and extending a distance of about 100 miles. In the following season, by April 1862, the Series was advanced a further distance of 90 miles by 1 double polygon and 2 hexagons embracing 21 triangles. The triangulation had now reached a point in the Kistna district near the meridian of Madras, whence it shortly afterwards merged into the meridional series, which was intended to connect Jubbulpore and Madras.

After completing the Series thus far, Captain Basevi returned to Vizagapatam to select a site for the base-line of verification, which it was proposed to measure in this neighbourhood. He succeeded in obtaining a suitable site, but not until his field operations had been so long protracted that it was the middle of June before he could break up his camp and return to quarters.

Season 1862-63.

PERSONNEL.

Captain J. P. Basevi, R.E., 1st Assistant.
" B. R. Branfill, 2nd "
Lieut. W. M. Campbell, R.E., 2nd "
R. Clarkson, Esq., Civil Assistant.
Mr. F. Ryall, Sub-Assistant 2nd Class.
" J. R. L. O'Neill, " 3rd "

On re-entering the field early in October, he found the rains had been so heavy that the surrounding tanks had been converted into lakes, and that the ground selected for the measurement lay submerged under a sheet of water, in some parts as much as sixteen feet deep. By great exertions the water was drained off into adjoining ravines, and a portion of the line was ready for measuring in December; the remainder had become fairly dry by the time it was reached. The details of the measurement of the Vizagapatam Base-line will be found in Section VIII, Vol. I of the *Account of the Operations of the Great Trigonometrical Survey of India.* It will suffice here to remark that its length is six and a half miles, that Major J. T. Walker, R.E., the Superintendent of the Great Trigonometrical Survey himself superintended the work, and that Captain Basevi's party was employed on the measurement. It was divided into three verificatory sections, which were subsequently checked by two series of triangles, one on each flank of the base, to test the measure of each section against the others. The tests were satisfactory, for the extreme difference between the measured length of the whole base and its computed length by triangulation from either section, was found to be only one inch. The comparison of the measured length with the computed value brought down by triangulation from the Calcutta Base-line was singularly satisfactory, for the error of the computed value was only a quarter of an inch, though the triangulation embraced a distance of four hundred and sixty-six miles, much of it passing over flat plains, which were covered with dense forest and jungle and very difficult to work through.

On the completion of the base-line, Captain Branfill was deputed to connect it with the principal triangles of the East Coast Series, and to execute the verificatory triangulation between the sections. He also observed an azimuth, and carried a line of levels from the south end of the base to the Tide Point Station at the Jetty at Vizagapatam, where tidal observations had been previously taken, a synopsis of which will be found in the Introduction to the East Coast Series on pages XXXIV—$_{C.}$ to XXXVII—$_{C.}$ of Volume VI of the *Account of the Operations &c.*

Meanwhile Captain Basevi proceeded to make a reconnoissance of the neighbouring territories of the Rája of Jeypore (Jayapuram), concerning which little or nothing was known. "It is a singular fact," writes Major Walker in 1863, "that in the vicinity of the British "stations of Vizagapatam and Vizianagrum (Vijayanagaram), and within sixty miles of a "coast which has been frequented by British traders for upwards of a century, there is an "extensive tract of country, subject to a friendly Rája, of which less is known than of dis-"tricts occupied by hostile tribes along the frontier of our recently acquired Punjab (Panjáb) "Provinces. A glance at any map of the Madras Presidency reveals a great blank in our "geographical knowledge of the tract of country which lies parallel to the coast and north-"east of the Godávari river. Its deadly reputation appears to have been a bar alike to the "explorations of the curious and scientific, and to the visits of sportsmen. No regular survey "of it has ever been attempted; the few places given on the map seem to have been obtained "from Native information, for they are generally exceedingly erroneous.

"A reconnoissance of this tract was required for our own operations round Vizaga-"patam. As any reliable information regarding lands so little known might be expected "to be of much value and general interest, I was much gratified when Captain Basevi "volunteered to reconnoitre this *terra incognita*; though at the same time I could not but "feel apprehensive for his safety in a country so deadly; for his route would have to pass "through dense jungle, in which it would be necessary for him to preserve his reckoning "by the troublesome process of traversing, which under such circumstances is very labo-"rious, and entails the necessity of performing the greater part of each day's march on foot. "The inevitable exposure to be thus undergone is very great in a tropical climate; and "when the district to be traversed is known to be exceedingly feverish and unhealthy, no "small amount of courage is needed to prompt a man to volunteer for such a task."

Captain Basevi took with him one European Assistant, Mr. O'Neill, and a few natives. By means of a compass and perambulator a traverse was run from Kásipuram at the foot of the hills to Jeypore city, and from Jeypore to Bhadráchalam on the Godávari: observations for time and latitude were taken with a 7-inch theodolite whenever the weather permitted, and readings of the barometers and thermometers were recorded regularly to afford data for computing the heights above the sea-level. At Padawa, five marches from Kásipuram, Mr. O'Neill became so ill that he was obliged to return, and fever commenced among the natives of the party. The results of this reconnoissance were a good preliminary map of Jeypore; a report by Captain Basevi, giving the details of his route and a general description of the country; several valuable astronomical determinations of latitudes and longitudes and barometrical determinations of heights; also memoranda of various other routes, the details of which were obtained from native information. Captain Basevi was occupied with this work from the 10th of February to the 9th of April. In the following autumn he proceeded to Europe on furlough, and the command of the party devolved on Captain B. R. Branfill of the Bengal Cavalry.

Season 1863-64.

PERSONNEL.

Captain B. R. Branfill, 1st Assistant.
R. Clarkson, Esq., Civil Assistant.
Mr. F. Ryall, Sub-Assistant, 2nd Class.
„ J. W. Mitchell, Sub-Assistant, 3rd Class.
„ J. R. L. O'Neill, „ „

On the completion of the base-line computations early in November, the party marched from its recess quarters at Vizagapatam, and recommenced operations near Guntúr on the 1st of December. Mr. Clarkson had charge of the approximate series, which by the 1st of January he had carried down as far as Nellore (Nellúr). Captain Branfill had marked this town for the goal of the present season's principal observations, and as the country between it and Madras had already been topographically surveyed, Mr. Clarkson was recalled and no more approximate work carried out. The main party was greatly delayed at several hill stations by want of coolies, and by the end of January the final observations of only two polygons had been completed, and one azimuth of verification observed to δ Ursæ Minoris at Dánapa H.S. The stations however were two marches apart and all situated on difficult hills that required two days to ascend and descend. Extra precautions were taken for the preservation of the stations of the Kotapa heptagon, with a view to the continuation of the series northwards to connect with the Jubbulpore Meridional Series, as the nature of the soil and the materials with which the two stations of Dhúlipalla and Pálapáru were constructed, were such that the platforms were certain after a few rainy seasons to disappear, and leave the masonry pillars exposed and liable to injury. In the next figure, the Medaramĕtla hexagon, the ray from Farangul-dinne to Ongole was found to be impracticable between the hours of 2 and 4-30 P.M., the period of minimum refraction, even when elevated signals were employed. Between half past seven and eight in the evening the stations were however mutually visible, and by Captain Branfill observing at the former with the large instrument and Mr. Ryall at the latter with an 8-inch theodolite between these times on an appointed night, simultaneous reciprocal vertical angles were taken. In the month of March Mr. Clarkson was recalled from Guntúr to proceed, in advance of the main party, and fill up a gap which had been left in the approximate series two years previously, but he was unfortunately delayed in completing his secondary work, and his orders were countermanded. In consequence of this Captain Branfill himself, after taking observations at Netivaripálĕm and Pichĕrla, was obliged to desist observing and proceeded to select stations for the east end of the side of continuation and for the east flank of the southern portion of the Netivaripálĕm–Kuchĕrla double hexagon. After great difficulty and a month's delay Kesavaram and Darutippa were fixed on, and 12 to 15 feet platforms built at those places and at Puripád. On commencing the next figure, the Rájalli hexagon, the weather became extremely hazy, and it was doubtful, whether the figure could be completed before the end of the field season; but by constantly watching and seizing every opportunity of observing, all the final angles of the polygon were taken. The hill station of Yĕrrakŏnda had only just been quitted by the party, when the hill caught fire, and one set of signalling apparatus was destroyed.

Only three stations having been selected and none built in advance of the Rájalli hexagon, Captain Branfill determined to close operations and march to Madras, which he reached at the beginning of May. Mr. Clarkson however continued to work on the approximate series; he selected 17 stations forming a double polygon, a heptagon and part of a single polygon, extending the series to the vicinity of Madras, and rejoined the office at Ootacamund so late as the 1st of August.

Leaving the instruments and tents in a casemate in Fort St. George, he proceeded with the records and office to Ootacamund (Ontikalmanda), having first collected all the information he could concerning a tide-gauge and the practicability of connecting the series of triangulation with the Astronomical Observatory at Madras.

The principal work, completed during this field season, consisted of one heptagon, two hexagons, and a double polygon; there were 29 triangles in the four figures, extending the series a direct distance of 138 miles from north to south.

On searching for the south-end of the Madras (St. Thomas's) base-line, measured in

1802 by the Trigonometrical Survey under Major Lambton, it was found that all the stones excepting three had been carried off for the purpose of building a temple in the adjoining village. The fact was brought to the notice of the Madras Collector, and a full enquiry held, but with no satisfactory result. During the recess season Captain Branfill also visited Bangalore, and having after much search discovered the ends of the old Bangalore base, measured there in 1804, he took steps for their future preservation.

The principal computations were finished early in October, and the whole party left for Madras, resuming work there on the 1st of November. This month was stormy and rainy, and was spent in organising the field parties, repairing instruments, and in completing the secondary computations and the charts.

Season 1864-65.

PERSONNEL.

Captain B. R. Branfill, Bengal Cavalry, 1st Asst.
Mr. F. Ryall, Sub-Assistant 1st Class.
" J. W. Mitchell, " 2nd "
" J. R. L. O'Neill, " 3rd "

The entire party took the field on the 5th of December and was distributed as follows:—Mr. Ryall to take up the approximate series near the Pulicat (Paraverkádu) lake, to select one or two stations on the east flank, clear the rays, and arrange for building the necessary towers. Captain Branfill himself, accompanied by Mr. O'Neill and a native recorder Gangadram Mudhli, proceeded to Nellore to fix that place and resume the principal triangulation in the neighbourhood. After recording the azimuth observed at Kistama H.S. in December and assisting for a few weeks in the observatory and office, until the native recorder had become efficient in his duties, Mr. O'Neill was sent to assist Mr. Ryall in the approximate series by superintending the tower-building.

During February the Jonangipálĕm tower fell, but was rebuilt in time to obviate more than a few days' delay. In March and April the progress of the work was very seriously delayed by the cloudy weather which is so prevalent along this coast, and from the haziness of the atmosphere. Another cause of delay was the deficiency of positive or excess of negative refraction, rendering the rays which, though perhaps grazing, had been quite practicable in January quite out of the question in April, so that the Rĕttambedu and Chĕmbedu pillars had to be raised from 8 to 12 feet higher, and the signals raised still more on scaffolds erected for the purpose at certain other stations.

Observations were completed at Rĕttambedu and Chĕmbedu by April and the rest of the season was employed in carrying on the triangulation to Madras and connecting it with the Madras Observatory. As, however, this triangulation now appertains to the Madras Longitudinal Series no further reference to it is needed here.

Now that the coast triangulation had been completed, the only work remaining on the Series under review, was to connect that portion of it which lay on the meridian of Madras with the Jubbulpore Meridional Series. The latter was commenced in the field season of 1864-65 under the direction of Mr. Shelverton, and by April 1866 had been carried as far south as the parallel of 20° 30′. In 1866-67 the principal triangulation was further extended by the same officer to the parallel of 18° 35′, and all the remaining stations selected in advance.

The party took the field in November, when Mr. Hickie was despatched to take up the approximate series which had reached the parallel of 20°. He had during the previous field season reconnoitered the country between the parallels of 19° and 20°, and was thus able soon after reaching his ground to select finally the stations of the Ankora and Burgpaili polygons, both of which appertain to the Jubbulpore Meridional Series. He then suffered from a severe attack of malarious fever, which compelled him to seek medical aid at the civil station of Seroncha. After his recovery he selected the Katájpur–Bolikŏnda double polygon of the Bider Longitudinal Series, and the two quadrilaterals and the pentagon which belong to the Madras Meridional. He closed on the northernmost side of the latter, on the stations of Mániam and Dhúlipalla. The approximate series was thus completed, having been extended in this field season a direct distance of 245 miles.

Season 1866-67.

PERSONNEL.

G. Shelverton, Esq., Assistant Surveyor.
Mr. M. C. Hickie, Civil Assistant, 4th Grade.
„ F. Bell, Sub-Assistant, 1st „
„ L. J. Pocock, Sub-Assistant, 3rd „
„ E. P. Wrixon, Probationary Sub-Assistant.

On commencing operations in the following year a gap of about 2° 10′, between the parallels of 16° 25′ and 18° 35′, still remained to be finished, to connect the northern portion of this chain of triangles, which emanates from a side near Jubbulpore of the Calcutta Longitudinal Series, with the southern portion between Guntúr and Madras. As it was not deemed safe to march through the unhealthy forest tracts between the Nerbudda (Narbadda) and Godávari rivers earlier than December, the party did not take the field till late. On the march down from Jubbulpore the *kahárs* or carriers engaged for the 36-inch theodolite deserted in a body at Nágpur, and a delay of ten days ensued: after crossing the Godávari, and entering the Hyderabad (Haidarabad) States, Mr. Shelverton was always supplied with as many carriers as he wanted by the officials of His Highness the Nizam. By the middle of March the Katájpur–Bolikŏnda double polygon of the Bider Longitudinal Series had been completed, and the triangulation of the Madras Meridional Series was then commenced. Many difficulties were caused by the great drought from which the country was suffering. The numerous tanks, upon which the inhabitants principally rely for the irrigation of their crops during the cold months, were in nearly all cases perfectly dry. The cultivation was restricted at each village to a field or two, watered from rude gaping wells nearly as wide as they are deep. At Anantagiri H.S., a hillock composed entirely of hard sandstone, there is a fort with an inner and outer wall, and water is to be found throughout nearly the whole year in the clefts and hollows of the rocks. At the foot of the hill there is a well with the inscription in the Tilingi character, stating that it was sunk in the year 1540 of the Hindu era of Salivahana (about 268 years ago) by a Chhatri Rája, and further that the sun was eclipsed that year. Between the stations of Anantagiri and Niálamari there is a strip of British territory containing about 80 villages. A metalled road runs through it from Masulipatam on the sea coast to Hyderabad.

Season 1867-68.

PERSONNEL.

G. Shelverton, Esq., Assistant Surveyor.
Mr. M. C. Hickie, Civil Assistant, 4th Grade.
„ F. Bell, Sub-Assistant, 1st „
„ E. P. Wrixon, Probationary Sub-Asst.
„ A. C. Low, „ „

The forts and fortifications to be met with in the portion of the Hyderabad territory, through which this series of triangulation passes, are attributed by the inhabitants to the Tilingána kings, who ruled the country prior to its conquest by the Muhammadans, and who have left behind them traces of a high state of civilization. The present rulers have done nothing to improve the country. Their chief towns are simply a large collection of rude huts, but the people are contented with the Government.

The old Tilingána capital, Warangal, is full of interesting remains. The temples sacred to Mahádeo, built of massive stone with exquisitely carved interiors, are common enough in the country. His attendant bulls, some of them of life size, are cut with all their trappings out of single blocks of stone. Hanumkŏnda, a city that has sprung up outside the ruins of Warangal, contains a temple called the Hazár Khamb, so named from the thousand pillars that support it; this temple is also dedicated to Mahádeo, who is the principal divinity worshipped. The banks of the river Kistna were very little cultivated where the triangulation crossed over; slate crops up through the soil rendering it unfit for the plough. On the left bank of the river, skirting this tract of slate, there are some remarkable ruins, and numerous cromlechs.

On the 8th of April 1868, the party entered the Kistna district of the Madras Presidency, crossing the river Kistna at the Kollúr ford, where the bottom is shingly, and the water at this time of the year only knee-deep. At Miádarsál H.S., facing the delta of the Kistna river, Mr. Shelverton was delayed for the first time during the season by bad signals. During his stay here, a high wind prevailed from the south-west heavily laden with moisture. The northern face of the Miádarsál hill is very precipitous, while the southern face is fortified with a stone wall. From Miádarsál H.S. the party marched to Govindapuram where they encamped, and thence to Sárangapalle H.S. which is situated on a low plateau skirting the river Kistna. The inhabitants of our villages near the Hyderabad frontier were as a rule very surly, and presented a marked contrast to the rest of the people in the Kistna district, who were always willing to help the surveyors in every way. Mániam H.S., one of the stations of the closing side was next visited. There were some iron works at Gŏndlapalle, the nearest village, the ore being obtained in the neighbourhood. The furnace, which was shaped like a chimney, and perforated at intervals, was charged with alternate layers of wood, charcoal, and ore, till it was nearly full; the lowermost layer of charcoal was then ignited, and the furnace closed up for 15 hours. The result was a lump of metal weighing about twenty seers, and valued at two rupees. From Mániam the party proceeded to Kachalboru, the central station of the last figure. Here the natives of the establishment suffered to an alarming extent from an affection of the kidneys, accompanied by pains in the small of the back, and temporary stricture of the neck of the bladder, caused apparently by drinking the water of the village well, which must have held some caustic alkali in solution. The panic was indescribable, as hardly a man escaped. Voruvakallu H.S. was situated on the top of an almost perpendicular rock, and in order to take the instrument up to it, a strong rope ladder, with stout wooden rungs, was laid in zigzags, and well secured along the face of the hill. The season's work terminated at Dhúlipalla on the 1st May 1868. At both the stations of the closing side the upper mark-stones were found in position, and the pillars shewed no signs of having been tampered with. After closing operations, the party marched to recess at Waltair (Váltĕru), in the Madras Presidency, reaching it on the 25th of May 1868. The route adopted was by Bĕzváda, Ellore (Ellúru), and Rajahmundry.

On the completion of the Simultaneous Reduction of the Southern Trigon it was found that the errors which had actually been dispersed over the Madras Meridional Series between the origin Kándágatla–Adáligat and the terminus Nagari–Chĕmbedu were as follows:—

In Logarithm of the latter side ...	... =	+ 0·000,0018,1 or 0·26 inches per mile.
„ Azimuth „ „ ...	... =	− 1″·723
„ Latitude of Nagari ...	... =	− 0 ·044
„ Longitude „	... =	+ 0 ·051

The errors dispersed over the remaining portion of the Coast Series between the origin Sánjib–Dhár and the terminus Dhúlípalla–Ádamsáb were as follows:—

In Logarithm of the latter side ...	... =	− 0·000,0009,2 or 0·13 inches per mile.
„ Azimuth „ „ ...	... =	+ 0″·624
„ Latitude of Dhúlipalla ...	... =	+ 0 ·038
„ Longitude „	... =	+ 0 ·002

Secondary Triangulation.

A large amount of secondary triangulation was executed by the party employed on the Madras Meridional and Coast Series, for the purposes of fixing numerous points on the actual line of coast, and of laying down the courses of the Godávari and Kistna rivers. In 1861 Mr. Howard was employed in conducting a secondary series immediately along the sea coast in the neighbourhood of Vizagapatam. For a considerable distance he had hills and clear ground, and was able to proceed with great rapidity, but on approaching Cocanada (Kákináda) his progress was much retarded by having to clear every ray through very valuable ground, abounding in mango topes and palmyra trees. His triangles extended over a distance of 100 miles, defining the coast line well, and fixing the positions of the light-houses at Cocanada and Coringa (Kŏrangi), points of nautical importance. In the same year Mr. Ellison carried a secondary chain westward from the principal series to fix the positions of Rajahmundry and Dowlaishweram (Dhavalĕsvaram). In the field season of 1862-63 the Madras Coast Party was employed on the measurement of the Vizagapatam Base-line, and no triangulation was carried out, but in the following year a considerable amount of secondary work was executed for the purpose of fixing the geographical position of Masulipatam, the light-houses and other points on the coast. Mr. Clarkson selected and observed the first six triangles of the Masulipatam and Point Devi Minor Series, starting from the sides Bĕzváda–Anantavaram–Gorantla, and having to trace and clear most of the rays: he was then succeeded in this work by Mr. Ryall, who in the course of the season, selected all the remaining stations of the series, forming 25 triangles, and extending 45 miles; the connection was made with Masulipatam and the Point Devi Light-house, though the delta of the Kistna is a very difficult country for triangulation, being overgrown with jungle and intersected by water-courses and swamps in a deep alluvial soil. This series was completed in 1865-66 by Mr. Mitchell, the main portion of the party being employed on the Madras Longitudinal Series. In the same field season, the town of Nellore and the light-house of Pulicat were fixed by Mr. O'Neill; and in 1867-68 numerous points were determined by Mr. Shelverton near the meridian of 80° between the Godávari and Kistna rivers.

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MADRAS MERIDIONAL AND COAST SERIES.

PRINCIPAL TRIANGULATION. ALPHABETICAL LIST OF STATIONS.

Adakŏnda	LVI.
Adáligat (Of the Bider Longitudinal Series, South-East Quadrilateral).	XV.
Ádamsáb	X.
Anantagiri	I.
Anantavaram	LXXI.
Anĕpúdi	XXXIX.
Aupád	LVIII.
Babbĕpalle	XIII.
Bandalduru	XXXIV.
Bandanchĕrla	LXI.
Bĕzváda	LXIX.
Chákalakŏnda	XXVII.
Chemakurti	XIX.
Chĕmbedu (Of the Madras Longitudinal Series).	XXXV.
Chikri	LXXV.
Chintalapád	LXXII.
Dálgattu	LXV.
Dánapa	XIV.
Darutippa	XXV.
Dhár (Of the Bider Longitudinal Series, South-East Quadrilateral).	XXXIX.
Dhúlipalla	VII.
Dudugat	LXIII.
Elangoi	LI.
Faranguldinne	XVI.
Gorantla	LXXIV.
Gudali	XXXVIII.
Gundálamma	XLV.
Gurramkŏnda	XXXVII.
Inupráyi	LXIV.
Jammalavoidurgam	LXVII.
Jonangipálĕm	XLII.
Jŏnnalagadda	LXX.
Jujúrdurgam	LXVIII.
Kachalboru	V.
Kalimámidi	XLIX.
Kambákamdurgam	XLI.
Kándágatla (Of the Bider Longitudinal Series, South-East Quadrilateral).	XII.
Kappa	LII.
Kappakŏnda	XLVI.
Kayyúr	XXXVI.
Kesavaram	XXVI.
Kistama	XXXI.
Kotapa	IX.
Kuchĕrla	XXIV.
Lachmipuram	LV.
Lagadapád	LXXIII.
Mániam	VIII.
Medaramĕtla	XV.
Miádarsál	III.
Nágal	XLVIII.
Nágaldurgam	LXII.
Nagari (Of the Madras Longitudinal Series).	XXXIII.

PRINCIPAL TRIANGULATION. ALPHABETICAL LIST OF STATIONS—(*Continued*).

Nallakŏnda	L.
Náwilmĕtta	LIII.
Netivaripálĕm	XX.
Niálamari	II.
Nishánbodu	XXIX.
Nishánkŏnda	XXII.
Ongole	XVIII.
Pagulráyi	XLVII.
Pálapáru	XII.
Pálchĕrla	XXXV.
Pallakŏnda	XXXII.
Parampúdi	LX.
Pĕddakaltippa	XVII.
Pichĕrla	XXIII.
Pillimedu	XL.
Pothkŏnda	LIV.
Puripád	XXI.
Rájalli	XXVIII.
Rĕttambedu	XLIV.
Sánjib (Of the Bider Longitudinal Series, South-East Quadrilateral).	XLI.
Sárangapalle	IV.
Sudkŏnda	LIX.
Voruvakallu	VI.
Vutukúr	XXXIII.
Yĕdlagattu	LVII.
Yerpet	XLIII.
Yĕrragattu	LXVI.
Yĕrrakŏnda	XI.
Yĕrrakŏnda	XXX.

MADRAS MERIDIONAL AND COAST SERIES.

PRINCIPAL TRIANGULATION. NUMERICAL LIST OF STATIONS.

XII	Of the Bider Longitudinal Series, South-East Quadrilateral.	Kándágatla.
XV		Adáligat.
I		Anantagiri.
II		Niálamari.
III		Miádarsál.
IV		Sárangapalle.
V		Kachalboru.
VI		Voruvakallu.
VII		Dhúlipalla.
VIII		Mániam.
IX		Kotapa.
X		Ádamsáb.
XI		Yĕrrakŏnda.
XII		Pálapáru.
XIII		Babbĕpalle.
XIV		Dánapa.
XV		Medaramĕtla.
XVI		Faranguldinne.
XVII		Pĕddakaltippa.
XVIII		Ongole.
XIX		Chemakurti.
XX		Netivaripálĕm.
XXI		Puripád.
XXII		Nishánkŏnda.
XXIII		Pichĕrla.
XXIV		Kuchĕrla.
XXV		Darutippa.
XXVI		Kesavaram.
XXVII		Chákalakŏnda.
XXVIII		Rájalli.
XXIX		Nishánbodu.
XXX		Yĕrrakŏnda.
XXXI		Kistama.
XXXII		Pallakŏnda.
XXXIII		Vutukúr.
XXXIV		Bandalduru.
XXXV		Pálchĕrla.
XXXVI		Kayyúr.
XXXVII		Gurramkŏnda.
XXXVIII		Gudali.
XXXIX		Ánĕpúdi.
XL		Pillimedu.
XLI		Kambákamdurgam.
XLII		Jonangipálĕm.
XLIII		Yerpet.
XLIV		Rĕttambedu.
XXXIII	Of the Madras Longitudinal Series.	Nagari.
XXXV		Chĕmbedu.
XXXIX	Of the Bider Longitudinal Series, South-East Quadrilateral.	Dhár.
XLI		Sánjib.
XLV		Gundálamma.
XLVI		Kappakŏnda.
XLVII		Pagulráyi.
XLVIII		Nágal.

PRINCIPAL TRIANGULATION. NUMERICAL LIST OF STATIONS—(*Continued*).

XLIX	Kalimámidi.	LXIII	Dudugat.
L	Nallakŏnda.	LXIV	Inupráyi.
LI	Elangoi.	LXV	Dálgattu.
LII	Kappa.	LXVI	Yĕrragattu.
LIII	Náwilmĕtta.	LXVII	Jammalavoidurgam.
LIV	Pothkŏnda.	LXVIII	Jujúrdurgam.
LV	Lachmipuram.	LXIX	Bĕzváda.
LVI	Adakŏnda.	LXX	Jŏnnalagadda.
LVII	Yĕdlagattu.	LXXI	Anantavaram.
LVIII	Aupád.	LXXII	Chintalapád.
LIX	Sudkŏnda.	LXXIII	Lagadapád.
LX	Parampúdi.	LXXIV	Gorantla.
LXI	Bandanchĕrla.	LXXV	Chikri.
LXII	Nágaldurgam.		

MADRAS MERIDIONAL AND COAST SERIES.

DESCRIPTION OF PRINCIPAL STATIONS.

The Principal Stations of this Series as well as six others of the Bider and Madras Longitudinal Series, which are common to this Series, are generally situated on hills or rising ground. With certain exceptions noted below, each consists of a solid, circular and isolated pillar of masonry about $3\frac{1}{3}$ feet in diameter and varying from 1 to 14 feet in height. In the centre and upper surface of the pillar a mark (circle and dot) engraved on a stone is imbedded in the normal of one or more similar marks inserted within the pillar, the lowermost in many instances being cut on the rock *in sitû*. Around the pillar and level with its upper surface, a solid platform of stones, of stones and earth, or of sun-dried bricks, 14 to 17 feet square, has been built for the accommodation of the observatory tent. The exceptions are the following:—Stations numbered XLIV, LII, as well as XXXV of the Madras Longitudinal Series: the first and third of these consist of high perforated pillars of masonry, surrounded by towers of sun-dried bricks for the observatory tent to rest on, both the central pillar and tower having an aperture at the base for access to the ground level mark: and the second is simply denoted by a circle and dot cut on a large mass of a rock.

A few stations at which observations were taken subsequent to the year 1867, have their upper marks protected by small pillars of masonry in the form of a frustum of a pyramid about 28 inches square at base and 20 inches at top and $3\frac{1}{2}$ feet in height. These protecting pillars carry sufficiently accurate marks on their upper surfaces for Topographical and Revenue Survey purposes, as shewn at page 74 of Volume II of the *Account of the Operations &c.*

The following descriptions have been compiled from those given by the officers who executed the Series, supplemented in the majority of cases, as regards adjacent villages and places, from the Madras Revenue Survey Maps (scale 1 Inch = 1 Mile) of the country traversed, and corrected, so far as the local sub-divisions in which the several stations are situated, from the Annual Returns furnished by the district officers to whose charge the stations are committed.

The orthography is based on the official lists published under the orders of the Government of India, except that the long *é* is unaccented as in all previous volumes of this series, but the short *e* is shewn thus, *ĕ*; the same remarks apply to *o*. Final vowels and those in well-known terminals are unaccented. When the popular spelling of a name has been accepted by Government its correct orthography is given in parenthesis where the name occurs for the first time.

XII. (*Of the Bider Longitudinal Series*). Kándágatla Hill Station, lat. 17° 18′, long. 79° 40′—observed at in 1868—is situated on a very conspicuous hill lying about $1\frac{3}{4}$ miles N.N.W. of the village of Kándágatla. It is built on the site of an old station, probably Colonel Lambton's "Kundagutt." The station is in the lands of the village of Kándágatla, taluk Nalgŏnda, Nizám's territories.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one imbedded in the upper surface of the pillar and the other 2·0 feet below it. The azimuths and distances of the following villages are:—Singavaram 245° 44′, miles 2·34; and Komalo 136° 9′, miles 2·8.

XV. (*Of the Bider Longitudinal Series*). Adáligat Hill Station (also called Idáligattu), lat. 17° 22′, long. 79° 58′—observed at in 1868—is on a hill lying about 3 miles N.E. of the village of Súbler. The station occupies the site of an old platform supposed to be a secondary station of the old Hyderabad (Haidarabad) Topographical Survey. It is in the lands of the village of Abiápálĕm, taluk Súbler, Nizám's territories.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 4 feet above it on a stone imbedded flush with the upper surface of the pillar. The azimuths and distances of the following villages are:—Abiápálĕm 144° 8′, miles 1·32; and Mamudapuram 34° 3′, miles 1·30.

I. Anantagiri Hill Station, lat. 17° 3′, long. 80° 2′—observed at in 1868—is situated on a sandstone hill which rises over the village of Anantagiri: the summit of the hill is fortified with an inner and outer wall. The station is about 30 feet N. of Colonel Lambton's station of "Anantageeree" and lies about 4 miles N.E. by

E. of Kumárabanda on the high road from Hyderabad to Masulipatam (Machilípatnam). It is in the lands of the village of Anantagiri, taluk Niálakŏndapalle, Nizám's territories.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones, one imbedded flush with the upper surface of the pillar and the other 2·75 feet below it. The azimuths and distances of the circumjacent villages are:—Aminabada 112° 35′, miles 1·42; Vĕnkatapuram 51° 50′, miles 2·24; Anantagiri 97° 5′, mile 0·31; and Khodandu 24° 49′, miles 4·6.

II. Niálamari Hill Station, lat. 17° 2′, long. 79° 46′—observed at in 1868—is on a hill about 7 miles W. of the village of Bírakhodagúdĕm on the high road from Hyderabad to Masulipatam. It is on the site of an old station, probably Colonel Lambton's "Nealamurree." It is in the lands of the village of Malkapuram, taluk Nalgŏnda, Nizám's territories.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2 feet above it on a stone imbedded flush with the upper surface of the pillar. The azimuths and distances of the circumjacent villages are:—Niálamari 251° 57′, miles 2·45; Chidalla 270° 34′, miles 3·57; Malkapuram 277° 1′, miles 1·97; and Suráyapet 136° 25′, miles 9·8.

III. Miádarsál Hill Station, lat. 16° 42′, long. 80° 6′—observed at in 1868—is on about the highest part of a very conspicuous range of hills on the right bank of the Kistna (Krishna) river, and 9½ miles S. by W. of the large village of Jaggayapet. The summit of the hill is fortified with a dry stone wall. The station is on the site of an old platform supposed to be of some former survey. It is in the lands of the village of Pulichinta, taluk Sattĕnapalle, district Kistna.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 14 inches above it on a stone imbedded flush with the upper surface of the pillar. The azimuths and distances of the circumjacent villages are:—Kollúr (No. 1) 83° 41′, miles 2·24; Kollúr (No. 2) 98° 28′, miles 2·57; Pulichinta 152° 56′, miles 2·15; Vĕlatúr 105° 58′, miles 2·83; and Udalúr 74° 15′, miles 7·2.

IV. Sárangapalle Hill Station, lat. 16° 41′, long. 79° 48′—observed at in 1868—is situated on a low flat-topped hill lying about 2 miles S. of the right bank of the Kistna river, and 7 miles N.E. by N. of Dáchepalle, a village a little S. of the high road from Hyderabad to Nellore (Nĕllúr). The station is about ½ a mile N. of an old platform supposed to be Colonel Lambton's "Sarangapully." It is in the lands of the village of Sárangapalle, taluk Palnád, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one on a stone imbedded flush with the upper surface of the pillar and the other about 5 feet below it. The directions and distances of the circumjaçent villages are:—Sárangapalle S.E. by S., miles 2¼; Madinapád S. by W., miles 3¾; Bhattupálĕm W. by S., miles 3; and Tangudda E.S.E., miles 5.

V. Kachalboru Hill Station, lat. 16° 31′, long. 80° 1′—observed at in 1868—is on a hill about 6½ miles E.N.E. of the village of Pidugurala on the high road from Hyderabad to Nellore, and 2½ miles N.W. of Bellamkŏnda. A peak of the same range somewhat higher than the station is about ¼ of a mile to the N.E. The station is in the lands of the village of Macháyapálĕm, taluk Sattĕnapalle, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2 feet above it on a stone imbedded flush with the upper surface of the pillar. The azimuths, directions and distances of the circumjacent villages are:—Macháyapálĕm 303° 49′, miles 1·38; Nandirazupálĕm 334° 54′, miles 2·06; Nagirĕddipálĕm 344° 42′, miles 2·86; Kananki W. by S., miles 3½; and Papáyapálĕm N.N.W., miles 2½.

VI. Voruvakallu Station, lat. 16° 36′, long. 80° 12′—observed at in 1868—is situated on the highest part of a remarkable rock overlooking the village of Voruvakallu which lies at its northern foot. It is about 3½ miles W. of the village of Kasala on the right bank of the Kistna river. The station is in the lands of the village of Voruvakallu, taluk Sattĕnapalle, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other about 1 foot above it on a stone imbedded flush with the upper surface of the pillar. The azimuths, directions and distances of the circumjacent villages are:—Rudravaram 175° 38′, miles 0·51; Voruvakallu 143° 47′, mile 0·04; Kanúr 249° 42′, miles 1·81; Grandisiri S.S.W., miles 1½; and Ambatipúdi N. by E., miles 2.

VII. Dhúlipalla Station, lat. 16° 26′, long. 80° 8′—observed at in 1863 and 1868—is on high ground in the midst of fields and lies about 4¾ miles N.W. by W. of the taluk town of Sattĕnapalle on the high road from Hyderabad to Guntúr, and the same distance N.N.W. of the large village of Madala. It is in the lands of the village of Dhúlipalla, taluk Sattĕnapalle, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are three mark-stones, one imbedded in the soil and two others at 3 and 5 feet above it, the last being flush with the upper surface of the pillar. When visited in 1868, the upper mark-stone was found undisturbed. The directions and distances of the circumjacent villages are:—Bhrugubanda N. by E., miles 1½; Dhúlipalla S. by W., miles 1¼; Makkapád N.W., miles 2¼; Rĕddigúdĕm W. by N., miles 2½; and Tŏndapi S.W. by S., miles 3½.

VIII. Mániam Hill Station, lat. 16° 22′, long. 79° 55′—observed at in 1863 and 1868—is on a range of rocky hills covered with brushwood and lies about 6 miles N.W. by N. of the large village of Vipparla and 5 miles S.S.W. of Pĕddanevalipuri both on the high road from Nellore to Hyderabad. It is in the lands of the village of Gattapalle, taluk Sattĕnapalle, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 1 foot above it on a stone imbedded flush with the upper surface of the pillar. When visited in 1868, the upper mark-stone was found undisturbed. The directions and distances of the circumjacent villages are:—Narasingapád N.E. by E., miles 2½; Gattapalle N. by W., miles 2½; Challaguntla E. by S., miles 5¼; Chijĕrla S.S.W., miles 4½; and Nekarikallu E. by S., miles 4.

IX. Kotapa Hill Station, lat. 16° 9′, long. 80° 5′—observed at in 1863—is from 20 to 30 feet east of a small shrine consisting of a heap of stones which occupies the highest part of a hill lying 5¾ miles S. by W. of the taluk town of Narsaraŏpet on the high road from Hyderabad to Parachúr, and 6½ miles N.W. of the town of Rájapet on the high road from Vinukŏnda to Guntúr. It is identical with Colonel Lambton's "Yellamundah," the circle and dot mark of which was found engraved on the rock *in sitû* and was adopted as the lower mark of the present station. It is in the lands of the village of Ĕllamanda, taluk Narsaraŏpet, district Kistna.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 7 inches above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Ĕllamanda N.E. by N., mile 1; Pĕtlurivaripálĕm W.N.W., miles 2¼; Kŏndakávúr S.W. by S., miles 2; Ĕdavalli S.S.E., miles 4¼; and Tangedupalle S.W. by W., miles 3¾.

X. Ádamsáb Hill Station, lat. 16° 15′, long. 80° 20′—observed at in 1862 and 1863—is on the site of an old Topographical Survey Station on the highest peak of a group of hills which lies about 10½ miles W. by S. of the town of Guntúr and 2¾ miles S.E. by S. of the village of Phirangipuram on the high road from Narsaraŏpet to Guntúr. The hill is well known from a shrine close to the station, built over what is considered by the natives to be a print of Adam's foot in the solid rock: there are also two small stone buildings close to the summit built evidently for pilgrims. On another part of the hills and above the village of Kŏndavíd are the ruins of a large fort. The summit of the hill consists of an enormous mass of nearly bare granite rock which rises perpendicularly from the S. and W. sides of the hill. The station is in the lands of the village of Kŏndavíd, taluk Narsaraŏpet, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 1 foot above it on a stone imbedded flush with the upper surface of the pillar. When visited in 1863, the station mark was found intact. The directions and distances of the circumjacent villages are:—Chávadavaram E. by S., miles 3½; Ĕnamadala S.E. by E., miles 3¼; Kŏndavíd W.N.W., miles 1¼; and Hávujuganisĕm N.W. by W., miles 1¼.

XI. Yĕrrakŏnda Hill Station, lat. 16° 6′, long. 79° 45′—observed at in 1862—is situated on a hill lying about 4 miles N.W. by N. of the taluk town Vinukŏnda on the high road from Kurnool (Karnúl) to Guntúr, and 3½ miles W.S.W. of the large village of Kŏndramutla. It is in the lands of the village of Vĕnkupálĕm, taluk Vinukŏnda, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 1 foot above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Tállapálĕm E.S.E., miles 1⅜; Vĕnkupálĕm S.S.E., miles 1¾; Pĕrúrpád W., miles 3¼; Vĕlatúr W.N.W., miles 3¾; and Sarikŏndapálĕm N.W. by N., miles 1⅝.

XII. Pálapáru Station, lat. 16° 3′, long. 80° 19′—observed at in 1864—is situated about 5¾ miles N. of the large village of Parachúr and 3¾ miles W. by S. of Pĕddanandipád both on the high road from Ongole (Vangol) to Guntúr. It is in the lands of the village of Pálapáru, taluk Bápatla, district Kistna.

The station consists of a platform of earth enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones, one imbedded in the soil and the other 2 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Pálapáru N.E. by E., mile ¾; Anavaram N. by W., miles 2¼; Uppalapád N.W. by W., miles 3; Ĕdupád W.S.W., miles 1⅜; and Inagallu S.E., miles 1¼.

XIII. Babbĕpalle Hill Station, lat. 15° 57′, long. 80° 10′—observed at in 1863—is situated on the summit of a hill ¾ of a mile W.S.W. of the village of Babbĕpalle on the high road from Ongole to Guntúr, and 2¾ miles S.E. by S. of the large village of Márutúr. It is in the lands of the village of Babbĕpalle, taluk Narsaraŏpet, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one on a stone imbedded flush with the upper surface of the pillar and the other 1 foot below it; the latter mark of a circle and a dot was found *in sitû* covered over by a pile of stones. The directions and distances of the circumjacent villages are:—Dronádula S.S.E., miles 2½; Punúr E. by S., miles 2½; Jŏnnatali W. by S., miles 2; and Darisa W. by S., miles 3½

XIV. Dánapa Hill Station, lat. 15° 56′, long. 79° 59′—observed at in 1862 and 1863—is situated on a range of hills lying nearly N. and S. and about 1½ miles W. of the high road from Madras to Hyderabad. The station is not on the highest peak of the hill, that being taken up by a place of worship. It is in the lands of the village of Gŏrĕpád, taluk Narsaraŏpet, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 1 foot above it on a stone imbedded flush with the upper surface of the pillar. When visited in 1863, the station was found intact. The directions and distances of the circumjacent villages are:—Kappĕrapád E., miles 1¾; Vaidana N.E., miles 2¾; Kukutlapalle N., miles 2; Gŏrĕpád W. by S., miles 2½; and the place of worship on the summit of the hill is N. by W. at a distance of about 150 to 200 yards.

XV. Medaramĕtla Hill Station, lat. 15° 44′, long. 80° 3′—observed at in 1864—is on a low hill, near large boulders irregularly piled up, about ½ mile W. of the high road from Madras to Hyderabad, and 6 miles S.S.E. of the town of Addanki on the high road. It is in the lands of the village of Medaramĕtla, taluk Ongole, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one on a stone imbedded flush with the upper surface of the pillar and the other 1 foot below it. The directions and distances of the circumjacent villages are:—Tamavaram W.S.W., miles 2½; Anamanamúr W. by N., miles 2½; Medaramĕtla E.S.E., miles 1½; and Timanapálĕm S.S.E., miles 3.

XVI. Faranguldinne Station, lat. 15° 41′, long. 80° 15′—observed at in 1864—is situated on the western side of a creek or inlet of the sea, on the site of an old town said to have been a French colony or trading port, about 4 miles from the sea coast. Excepting at very low spring tides there is uninterrupted communication with the sea. The station is about ¼ of a mile E. of the high road from Ongole to Bápatla, and is in the lands of the village of Pĕddaganjám, taluk Bápatla, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones, one in the foundation and the other 2 feet above it imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Mattigunta N.W. by W., miles 2¾; Nitiápálĕm S.W. by W., miles 2; Pĕddaganjám S.E. by S., miles 2¾; Razuvaripálĕm E.S.E., miles 1½; and Chinnaganjám E.N.E., miles 2¼.

XVII. Pĕddakaltippa Hill Station, lat. 15° 50′, long. 79° 46′—observed at in 1864—is situated on the top of a rocky hillock lying about 4¾ miles N.E. by N. of the town of Darsi, and 1½ miles W.N.W. of the village of Kalampilli. It is in the lands of the village of Timáyapálĕm, division Darsi, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitú* and the other 1 foot above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Basavapuram S. by E., miles 2; Timáyapálĕm W., miles 3½; Polavaram W. by N., miles 3¼; and Devavaram N.W. by N., miles 2.

XVIII. Ongole Hill Station, lat. 15° 30′, long. 80° 5′—observed at in 1864—is situated on a low hill about 200 feet in height, lying immediately W.S.W. of the taluk town of Ongole, and ¾ of a mile W. of the road from Nellore to Ongole. It is in the lands of the town of Ongole, taluk Ongole, district Nellore.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitú* and the other 2 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Anavaripud E.S.E., mile 1; Perana Mitta N.W., miles 3½; Mámidipálĕm S.S.W., mile ½; and Guddalaguntapálĕm N.W., mile ½.

XIX. Chemakurti Hill Station, lat. 15° 37′, long. 79° 52′—observed at in 1864—is on a high hill 3½ miles N.W. of the village of Chemakurti on the road from Ongole to Cumbum (Kambham), and about 12 miles from the former town. It is in the lands of the village of Chemakurti, taluk Ongole, district Nellore.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on a block of disrupted rock and the other 1 foot above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Puligŏnda S.S.W., miles 5; Padamatti Niyanipád E. by S., miles 3¾; and Kŏndúrivari E.S.E., miles 4.

XX. Netivaripálĕm Station, lat. 15° 23′, long. 79° 51′—observed at in 1864—is situated on an open swell of ground, about 7½ miles N. of Pŏnnalúr on the road from Kanigiri to Kandukúr, and 3¾ miles N.E. of Pachave on the Páler river. It is in the lands of the village of Netivaripálĕm, taluk Kandukúr, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones, one in the foundation and the other 1 foot above it imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Netivaripálĕm E., miles 1¼; Vardinenipálĕm W. by S., miles 3¼; Pĕddakandlagunta N. by W., miles 1¾; Kŏndapi N.E. by E., miles 4; and Ilavara Bechiragh E. by S., miles 1½.

XXI. Puripád (also called Ogúr Bĕllatippa) Station, lat. 15° 14′, long. 80° 1′—observed at in 1864—is situated about 5 miles E.N.E. of the taluk town of Kandukúr and ½ a mile S. of the road from Kandukúr to the sea coast. It is in the lands of the village of Pálakúr, taluk Kandukúr, district Nellore.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are three mark-stones, one imbedded flush with the upper surface of the pillar and two others at 5·9 and 6·9 feet respectively below it. The directions and distances of the circumjacent villages are:—Vogúr S.W. by W., miles 1¾; Pálakúr N.W., miles 2¾; Kanumalla N.E. by E., miles 1¾; Singaráyakŏnda E. by S., miles 3½; and Sanampúdi S.S.E., miles 2.

XXII. Nishánkŏnda Hill Station, lat. 15° 31′, long. 79° 37′—observed at in 1864—is situated on a peak of the Pŏdili hill; the higher peak of Bulímure on the same hill is about 200 or 300 yards N. of the station, but being inaccessible the station was not fixed on it. The station is 6½ miles S.S.W. of Pŏdili on the road from Cumbum to Ongole, and is on the site of an old Topographical Survey station of which the platform only was found. It is in the lands of the village of Pĕdda Arikatla, division Pŏdili, district Nellore.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitû* and the other 1 foot above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Yĕdavali S.W., miles 4½; Pĕdda Arikatla W., miles 3½; Chinna Arikatla N.W., miles 4; and Maripúdi E. by S., miles 5.

XXIII. Pichĕrla Hill Station, lat. 15° 12′, long. 79° 34′—observed at in 1864—is on the higher and most southern point of a hill about 6¼ miles S.W. by S. of Chĕrlapalle and 4¾ miles W. of Pĕdda Irlapád. The station is on the site of Colonel Lambton's "Peecherlacondah," but no mark was found. It is in the lands of the village of Chintagumpalle, taluk Kanigiri, district Nellore.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitû*, corresponding as nearly as possible to the centre of the pile of stone of Colonel Lambton's station, and the other 1 foot above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Nasika Trigambákam W., miles 2¾; Ballipalle N.W., miles 4½; and Pillapalle E., miles 3¼.

XXIV. Kuchĕrla Hill Station, lat. 15° 6′, long. 79° 44′—observed at in 1864—is on the S.E. end of the Chundi and Mallákŏnda hills and is 5 miles S. by E. of Chundi and 2 miles W. by N. of the large village of Lingasamudram. It is in the lands of the village of Lingasamudram, taluk Kandukúr, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitû* and the other 2 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Zamgamrĕddipálĕm E. by N., miles 1½; Vakamallávaripálĕm S.E. by E., miles 2; Metrala S.E. by S., miles 2½; and Yĕrraparĕddipalle N. by E., miles 1½.

XXV. Darutippa (also called Mangalapápĕmtippa) Station, lat. 15° 1′, long. 79° 58′—observed at in 1864—is about 4¼ miles S. by E. of the village of Gudlúr, and 6¼ miles W.S.W. of Tĕttu on the road from Madras to Ongole. It is in the lands of the village of Chalamchĕrla, taluk Kandukúr, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are five mark-stones, one imbedded in the upper surface of the pillar and four others at 2, 6, 10 and 12·56 feet respectively below it. At the time that the observations were taken the uppermost mark was tested by means of the four pickets fixed at the distance of 50 yards, N., S., E. and W., and was found to be deflected 1 inch to N. of the lowest mark. The observations are referred to the uppermost mark. The directions and distances of the circumjacent villages are:—Pĕddavaram S.W. by S., miles 1½; Chalamchĕrla S.E., miles 3; Ammavaripálĕm W. by N., miles 1¼; and Potlúr N.E. by N., miles 3.

XXVI. Kesavaram Station, lat. 14° 55′, long. 79° 52′—observed at in 1864—is on a mound 4½ miles N.N.W. of Chinnakraka village on the road from Udayagiri to Kávali, and 3½ miles W. of Gattupalle. It is in the lands of the village of Kesavaram, taluk Kávali, district Nellore.

The station consists of a platform partly of wood and partly of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter at top in which are six mark-stones, one imbedded flush with the upper surface of the pillar and five others at 2·2, 4·2, 5·31, 7·31 and 9·51 feet respectively below it. The directions and distances of the circumjacent villages are:—Kumárakŏndúr S.S.W., miles 4½; Kakutúr S.W., miles 4¾; Timasamudram W.S.W., miles 2¼; and Anavaram S.E. by S. miles 3¼.

XXVII. Chákalakŏnda (also called Aravikŏnda or Adivikŏnda) Hill Station, lat. 14° 57′, long. 79° 33′—observed at in 1864—is on a small isolated hill lying ¾ mile S. by W. of Chákalakŏnda (washermen's hill) village and 4 miles S.W. by S. of the large village of Garimanapĕnta. It is in the lands of the village of Chákalakŏnda, taluk Udayagiri, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitû* and the other 2 feet above it and level with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Kŏttapet S.W. by W., miles 3; Kaniyempád W.N.W., miles 4¾; Ganesapuram N. by W., miles 2¼; and Bottinavaripalle E. by N., mile ¾.

XXVIII. Rájalli Hill Station, lat. 14° 43′, long. 79° 39′—observed at in 1864—is on the site of a Topographical Survey station as denoted by a pile of stones in which no mark was found. The station is on a low hill lying ¾ of a mile S.E. of the village of Rájavol and 4½ miles N. of the hamlet of Nĕllúrpálĕm on the road from Nellore to Cuddapah. It is in the lands of the village of Rájavol, taluk Atmakúr, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitû* (about the centre of the pile of stones) and the other 2·04 feet above it and level with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Pamidipád S. by W., miles 2½; Dubagunta N.W., miles 3¾; Chávatabhímavaram N.E. by N., miles 2¾; and Punugod S.E. by S., miles 1½.

XXIX. Nishánbodu Hill Station, lat. 14° 42′, long. 79° 58′—observed at in 1864—is on the top of a low range of hills on the boundary of the villages of Yĕllapod, Damavaram and Dagadarti. It is in the lands of the village of Yĕllapod, taluk and district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, containing marks one of which is level with the upper surface of the pillar, but the number and positions of the others are unknown. The directions and distances of the circumjacent villages are:—Dagadarti S. by W., miles 2¼; Yĕllapod W. by S., miles 1½; Kamuenipád N.W. by N., miles 1½; and Damavaram E. by N., miles 2½.

XXX. Yĕrrakŏnda (also locally known as Gúdarikopu) Hill Station, lat. 14° 43′, long. 79° 18′—observed at in 1864—is on a detached range of hills about 1500 feet high 5¼ miles E. by N. of the junction of roads from Udayagiri and Atmakúr to Cuddapah (Kadapa). The station is identical with Colonel Lambton's "Yerracondah," the circle and dot of which were found in the remains of the old platform. It is in the lands of the village of Singanapalle, taluk Udayagiri, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one the old mark of Colonel Lambton's station and the other 2 feet above it on a stone embedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Singanapalle W. by S., miles 2¼; Brahmanapalle N.N.W., miles 2¾; Pegallapád N.E. by E., miles 4; and Chunchulúr S. by E., miles 5½.

XXXI. Kistama Hill Station, lat. 14° 27′, long. 79° 48′—observed at in April and December 1864—is on the top of Kistama hill. It is in the lands of the village of Prabhagiripatnam, taluk Atmakúr, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitú* and the other 2·6 feet above it and level with the upper surface of the pillar. When visited in December 1864, the station was found in perfect preservation and no alteration was made in its construction. The directions and distances of the circumjacent villages are:—Prabhagiripatnam W. by N., mile ½; Navuru W.N.W., miles 5½; Bhattulapalle N.W. by N., miles 5½; and Tatiparti N. by E., miles 4½.

XXXII. Pallakŏnda Hill Station, lat. 14° 24′, long. 79° 30′—observed at in April and December 1864—is 2¾ miles S.W. by W. of the village of Pallakŏnda on one of a group of hills lying 7 miles E. of the main range of the Eastern Gháts. It is in the lands of the village of Pallakŏnda, taluk Rápur, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter and 2 feet high in which are two marks, one on a stone imbedded in the upper surface of the pillar and the other at an unknown distance below it. On the second visit the station was found in perfect order. The directions and distances of the circumjacent villages are:—Garimanapĕnta S. by W., miles 1¾; Tegachĕrla W. by S., miles 3¼; and Kotúrpalle W. by N., miles 4½.

XXXIII. Vutukúr or Udkúr Hill Station, lat. 14° 14′, long. 79° 45′—observed at in 1865—is on the summit of a small rocky hill 5 miles N.W. by N. of the large village of Saidápuram on the main road from the town of Rápur to Gudúr, and 2¼ miles S. of the Pĕnner river. It is in the lands of the village of Vutukúr, taluk Rápur, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitú* and the other 3 feet above it on a stone imbedded level with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Pĕrumallapád N.W., mile ¾; Turimĕrla N.E., miles 3½; Vutukúr E. by S., miles 2¼; Jafalapuram S. by E., miles 1¾; and Chaganam S.W. by S., miles 2½.

XXXIV. Bandalduru Station, lat. 14° 18′, long. 79° 59′—observed at in 1865—is on a mound of earth, excavated from a tank on the high ground, about 2⅓ miles W.N.W. of the village of Sarvapalle, 4½ miles W.S.W. of Anakápalle and 2 miles S.S.E. of Vĕnkalachalam Chattram on the high road from Gudúr to Guntúr. It is in the lands of the village of Gudúr, taluk Gudúr, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two mark-stones, one in the foundation and the other 2 feet above it imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Tikkavarappan N.E. by E., miles 1⅓; Náyudipálĕm Khanerika S. by W., miles 1¼; Vadapálĕm W.S.W., miles 1¼; and Khandrikapálĕm S.S.W., miles 1⅜.

XXXV. Pálchĕrla Hill Station, lat. 14° 10′, long. 79° 31′—observed at in 1865—is on the highest point of the hill at the S. side of the E. entrance of the Rápur ghát (pass). The hill is an offshoot of the Vollukŏnda range, and the station lies about 2 miles S. of the road from the pass to the town of Rápur and 4¾ miles W.S.W. of the latter place. It is in the lands of the village of Rápur, taluk Rápur, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one on the rock *in sitú* and the other 3 feet above it on a stone imbedded flush with the upper surface of the pillar. The lower mark which consists of two cross lines was found cut on the rock *in sitú*. The directions and distances of the circumjacent villages are:—Panjili N.N.E., miles 3½; Devulapalle E.S.E., miles 3½; and Racharapĕnta S.E. by S., mile 1.

XXXVI. Kayyúr Hill Station, lat. 14° 1′, long. 79° 42′—observed at in 1865—is on a small rocky hill 1¼ miles S. by E. of the village of Kayyúr, 2 miles S.E. of the road from Chittoor (Chittúr) to Gudúr, and 6½ miles N.E. by E. of Vĕnkatagiri. It is in the lands of the village of Venugopálpuram, division Vĕnkatagiri, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitú* and the other 2·67 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Bangarupet (on the high road) S.W. by W., miles 5; Pilem E.S.E., miles 1¾; Tikkavaram S. by W., miles 1¼; and Akkasamudram N.W. by W., miles 1½.

XXXVII. Gurramkŏnda Hill Station, lat. 14° 1′, long. 79° 53′—observed at in 1865—is on a low hill 5 miles W. of Vojili on the high road from Madras to Gudúr, and 10 miles from the latter town. It is in the lands of the village of Gurramkŏnda, division Vĕnkatagiri, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are four marks, one engraved on the rock *in sitú* and three others on stones at 3, 5¼ and 7½ feet respectively above it, the uppermost being flush with the top of the pillar. The directions and distances of the circumjacent villages are:—Arimanupád W.N.W., miles 2¼; Gurramkŏnda W., mile 1; Sagutúr S.S.W., miles 1¾; and Karjamedu, W. miles 1½.

XXXVIII. Gudali Hill Station, lat. 14° 1′, long. 80° 4′—observed at in 1865—is on an isolated rocky hill lying about ½ a mile from the left bank of the Swarnamukhi river and immediately N. of the village of Gudali: it is 1 mile S.W. of the high road from Dugarázpatnam, on the sea coast, to the town of Gudúr, and 9½ miles W. by N. of Dugarázpatnam. This station is 110½ feet due W. of the centre of a platform of Colonel Lambton's secondary station of "Gooruloor": no mark was found. It is in the lands of the village of Gudali, taluk Gudúr, district Nellore.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitû* and the other 6 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Kota N.E. by E., miles 2½; Kurrugŏnda W., miles 4; Kasipuram S.E., miles 1¾; Razupálĕm W. by N., mile ½; and Tinnelapúdi E.S.E., miles 1¾.

XXXIX. Ánĕpúdi Tower Station, lat. 13° 48′, long. 80° 2′—observed at in 1865—is on a ridge in the midst of an extensive jungle, about 3 miles W. of the Pulicat (Paraverikád) lake and 3¼ miles E. by N. of Akarapák village on the high road from Madras to Nellore. It is in the lands of the village of Ánĕpúdi, division Polúr, district Nellore.

The station consists of a tower enclosing a solid pillar of masonry, the upper portion of which is isolated and 3½ feet in diameter; the pillar contains seven markstones at 2, 4, 6, 8, 10 and 14 feet respectively above the lowermost one. The directions and distances of the circumjacent villages are:—Ánĕpúdi N.E. by N., miles 1¾; Kallúr E.S.E., miles 1½; Surapa S.S.W., mile 1; and Muchalagunta N.W. by N., miles 3½.

XL. Pillimedu or Pallimer Hill Station, lat. 13° 51′, long. 79° 45′—observed at in 1865—is on the summit of a small rugged hill lying about a mile north from the left bank of the Swarnamukhi river, and 7 miles N. by E. of the town of Kálahasti. It is in the lands of the village of Pillimedu, zamindári Kálahasti, district North Arcot (Árkád).

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved in the rock *in sitû* and the other 1·5 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Pillamvedu N.E. by N., mile ¾; Rallapalle E. by S., mile ¾; Malapalle S.W. by S., miles 1¾; and Kasaram N.W. by N., miles 1¾.

XLI. Kambákamdurgam Hill Station, lat. 13° 34′, long. 79° 54′—observed at in 1865—is on the highest and most eastern point of the Pulicat hills, about 5 miles W.S.W. of the large village of Varadáyapálaiyam. Colonel Lambton's station of "Combaucum"—indicated by a pile of stones, but in which there is no mark—lies 45 or 46 feet distant from the present station at an azimuth of 29°. It is in the lands of the village of Kambákam, taluk Tiruvallúr, district Chingleput (Chĕngalpat).

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitû* and the other 1·5 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Kambákam E. by N., miles 3; Nelvai N.E. by N., miles 5; Pandúr E.S.E., miles 4½; aud Padrikuppam S.E. by E., miles 6.

XLII. Jonangipálĕm Tower Station, lat. 13° 39′, long. 80° 14′—observed at in 1865—is on a low sand ridge, 150 yards from the E. margin of the Pulicat lake and about 300 yards S. by E. of the well-known masjid of Jonangipálĕm. It is in the lands of the village of Rĕttamala, taluk Gudúr, district Nellore.

The station consists of a tower of sun-dried bricks enclosing a solid pillar of masonry 14 feet high, the upper portion of which is isolated and 3½ feet in diameter; the pillar contains eight mark-stones, the lowest at the ground level and seven others at 2, 4, 6, 8, 10, 12 and 14 feet respectively above it. The directions and distances of the circumjacent villages are:—Venád W., miles 4½; Bheripet N. by W., miles 2¼; Irakams S.W. by S., miles 6; and Chennugarepálĕm S.E. by E., miles 1¾.

XLIII. Yerpet Hill Station, lat. 13° 43′, long. 79° 36′—observed at in 1865—is on the S.E. extremity of the Eastern Gháts, about 2½ miles N.W. of the village of Yerpet on the road from the Tirupati Railway Station to Vĕnkatagiri, and 9¼ miles W. by S. of the town of Kálahasti. It is in the lands of the village of Yerpet, zamindári Kálahasti, district North Arcot.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one on the rock and the other 1·5 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the adjacent villages are:—Krishnampalle N.E., miles 2¼; Vĕnkatapuram S.E. by S., miles 2; and Amandúr S.E., miles 2.

XLIV. Rĕttambedu Tower Station, lat. 13° 26′, long. 80° 13′—observed at in 1865—is 3½ miles S. of the Pulicat lake and 3 miles E. of the high road: it is in the lands of the village of Rĕttambedu, taluk Pŏnneri, district Chingleput.

The station consists of a tower enclosing a perforated pillar of masonry 28·4 feet high, the upper portion of which is isolated and 3½ feet in diameter: the pillar contains a mark-stone imbedded at the ground level, to which access is obtained by a passage constructed for the purpose. The village of Rĕttambedu is S.S.W., 1½ miles.

XLV. Gundálamma Hill Station, lat. 17° 31′, long. 82° 22′—observed at in 1861—is on a range of hills stretching N.E. and S.W., and about 4 miles E.N.E. of the village of Lodŏddi and 12 miles in the same direction from the village of Jaddangi. The station is not on the highest point of the range but about ¼ of a mile S.W. of it, and is approached from the village of Ragapatnam on the E. by a road somewhat difficult for laden cattle. It is in the lands of the village of Doddŏdi, taluk Pĕddapur, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2·0 feet above it on a stone imbedded flush with the upper surface of the pillar. The approximate directions and distances of the following villages are:—Kimiligudda N.W., miles 4½; Tállapálĕm W., miles 5½; Vayer W., miles 6; and Vattangi W.S.W., miles 7¾.

XXXIII.—(*Of the Madras Longitudinal Series*). Nagari or Nagarímor Hill Station, lat. 13° 23′, long. 79° 38′—observed at in 1865—is on a very remarkable peak which rises abruptly at the western and south-western extremity of the mass of hills. The station is 3¼ miles S. by E. of the large village of Náráyanavaram on the high road from Tiruvallúr to Putúr. The peak is precipitous on the N.W. and S. sides, and is composed of gigantic boulders which seem piled in the most insecure manner as if the least shock would hurl the whole down. The station is not on the highest boulder. It is in the lands of the village of Náráyanavaram, zamindári Kárvĕtnagar, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter in which are two marks, one engraved on the rock *in sitú* and the other 1·5 feet above it on a stone imbedded flush with the upper surface of the pillar. The lower mark was found cut on the rock and is probably that of a station of Colonel Lambton's triangulation. The approximate directions and distances of the adjacent places are:—Putúr station of the Madras Railway N.W. by N., miles 4¾; Paramesvaramangalam N.W., miles 2; Gavanesapuram (on the high road near the fifth milestone) W.N.W., miles 1½; Bojarájapálĕm N.N.E., miles 2; Mangada S.S.E., miles 3¼; and Rámasamudram W., miles 2½.

XXXV.—(*Of the Madras Longitudinal Series*). Chĕmbedu or Chĕmber Tower Station, lat. 13° 15′, long. 80° 1′—observed at in 1865—is on an extensive swell of ground, about 10 miles N.E. of the town of Tiruvallúr and the same distance N.N.W. of Tinnanúr Railway station. The station is about 50 feet N.E. of an old cairn of stones in which no mark was found but which is supposed to indicate the site of a secondary point of Colonel Lambton's triangulation. It is in the lands of the village of Chĕmbedu, taluk Tiruvallúr, district Chingleput.

The station consists of a tower of sun-dried bricks enclosing a perforated pillar of masonry 70·3 feet high, containing a mark-stone imbedded at the ground level. This pillar was 54·9 feet high when the observations were taken from it and was raised to its present height subsequently to fix the position of the Madras Dome Observatory Station of the Madras Longitudinal Series. The approximate directions and distances of the adjacent villages are:—Chĕmbedu S.E., miles 1¾; Malandúr N.W., miles 1½; Maiúr S.W., miles 2½; Ĕrikuppam N.E. by E., miles 2½; and Pĕriyapálaiyam N.E., miles 5¾.

XXXIX.—(*Of the Bider Longitudinal Series*). Dhár Hill Station, lat. 17° 44′, long. 82° 31′—observed at in 1860, 1861 and 1871—is on a hill known to the European residents of the district as "Golconda Hill" from its vicinity to Gŏlgŏnda. It is in taluk Gŏlgŏnda, district Vizagapatam (Vishakhapatnam).

The station consists of a platform of stones enclosing a solid, circular and isolated pillar of masonry in which are two marks, one in the upper surface of the pillar and the other 2·0 feet below it. When visited in 1871, the mark was found undisturbed. The estimated directions and distances of the circumjacent places are:—Gŏlgŏnda S. by W., miles 3½; Narsapatnam E.S.E., miles 11; Paspushettepálĕm at foot of hill E., miles 7; Songari N., miles 2½; and Lamsingi N. by E., miles 5¾.

XLI.—(*Of the Bider Longitudinal Series*). Sánjib Hill Station, lat. 17° 31′, long. 82° 44′—observed at in 1860—is on the summit of a high, conspicuous hill so named, the most elevated of the group or range running parallel with the coast. The station is about 10 miles from the sea coast, and is in taluk Gŏlgŏnda, district Vizagapatam.

The station consists of a platform of stones enclosing a solid, circular and isolated pillar of masonry in which are two marks, one in the upper surface of the pillar and the other 1·5 feet below. The directions and distances of the following places are:—Uratla (the residence of the Rája) N., miles 3; and Goteara village E.N.E., miles 2.

XLVI. Kappakŏnda Hill Station, lat. 17° 20′, long. 82° 31′—observed at in 1861—is on a low range of hills lying in a N.E. and S.W. direction, and about 7 miles from the sea coast. The station is immediately north of the main road from Rajahmundry (Rájamahĕndravaram) to Vizagapatam, and about 3 miles N.N.W. of the village of Hamsavaram. It is in the lands of the village of Kotúr, division Tuni, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 1·0 foot above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the following villages are:—Thonamutta S.S.E., miles 1¼; Attumelta S., miles 1½; Vĕnkatakrishnaráyapuram S. by W., miles 2½; Paidipala S.S.W., miles 5; Tuni N., miles 3½; and Suraprajpet N.E., miles 2.

XLVII. Pagulráyi Hill Station, lat. 17° 47′, long. 82° 18′—observed at in 1861—is on the summit of a high broad hill, 3½ miles N. of the large village of Badrala and 7 miles S.E. by S. of Gudiam. The station is in taluk Gŏlgŏnda, district Vizagapatam.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Pĕddavalasa E., miles 1½; Kŏttapet N. by W., mile 1; Turimamadi N.N.W., mile ¾; Saprathpálaiyam E.S.E., miles 2¼; and Kinding S.W. by S., miles 2¾.

XLVIII. Nágál Hill Station, lat. 17° 21′, long. 82° 13′—observed at in 1861—is on the south-western extremity of a long range of hills running parallel to and at a distance of about 22 miles from the coast, and 7 miles N.E. of the large village of Yĕlesvaram on the road from Jaggammapet to Jaddangi. It is in the lands of the village of Gokavaram, division Tuni, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2·0 feet above it on a stone imbedded flush with the upper surface of the pillar. The approximate directions and distances of the following villages are:—Kimmúr W. by S., miles 3¼; Lingamparti S.W. by S., miles 6½; and Bayapád N.N.E., miles 2½.

XLIX. Kalimámidi Hill Station, lat. 17° 35′, long. 82° 9′—observed at in 1861—is on a high triple headed hill at the north-eastern extremity of a range running N.E. and S.W. It is in the lands of the village of Kalimámidi, taluk Rajahmundry, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 1·5 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Jagpálĕm N.N.W., mile 1; Duchurti W., miles 4; Kalimámidi S.W. by W., mile 1; Bhímaram S.W., miles 6½; Somalpád S.S.W., miles 2¾; and Ulbong S., miles 1½.

L. Nallakŏnda Hill Station, lat. 17° 18′, long. 82° 0′—observed at 1861—is on a hill near the centre of a low range running nearly east and west, about 3¾ miles nearly E.N.E. of the large village of Kŏttapalle and 2½ miles W. of Mallávaram. It is in the lands of the village of Dŏddipálĕm, taluk Rajahmundry, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2·0 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Loddipálĕm (at foot of hill) S.S.E., mile ½; Baiyanapalli N.W. by W., miles 1½; Sivarampatnam S. by E., miles 1½; and Razupálĕm S.S.W., miles 1½.

LI. Elangoi Hill Station, lat. 17° 3′, long. 82° 6′—observed at in 1861—is on a low flat-topped hill covered with brushwood, about 5 miles W.S.W. from the town of Pĕddapur on the road from Rajahmundry to Sámalkot, and 7¾ miles S. of Jaggammapet. It is in the lands of the village of Kŏndapalli, taluk Pĕddapur, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are three mark-stones, one imbedded in the upper surface of the pillar and the others at 2 and 4 feet respectively below it. The directions and distances of the circumjacent villages are:—Anúr W., miles 1½ (nearly); Kŏndapalli S.W. by W., mile 1; Chinnabrahmadevam S.E., miles 2¾; Ráyabhupalápatnam E. by S., miles 3; Surampálĕm N., miles 3½; and Kŏttapád W.N.W., miles 2¾.

LII. Kappa (also well known as Kappakŏnda) Hill Station, lat. 17° 30′, long. 81° 54′—observed at in 1861—is not on the highest point of the hill but on a spur 20 or 30 feet lower and a short distance to the S.E. of the summit. It is about 5¾ miles N.E. by E. of the large village of Rampa and is in the lands of the village of Vadapalli, taluk Rajahmundry, district Godávari.

The station is denoted by a circle and dot cut on a large mass of rock (red laterite), on which the theodolite stand was also set up. The directions and distances of the circumjacent villages are:—Borlagunda S. by W., miles 1½; Yĕrragada S.E. by E., miles 1¾; Manjel W., miles 2½; Pálĕm N.E. by N., miles 2¾; and Serúr E. by S., miles 1½.

LIII. Náwilmĕtta Station, lat. 17° 3′, long. 81° 55′—observed at in 1861—is on high, undulating, sandy ground ¼ of a mile south of the road from Rajahmundry to Vizagapatam, 6½ miles N.E. by E. of the former place, and 3 miles S.W. by W. of Rájanagram. It is in the lands of the village of Chekaradwara, taluk Rajahmundry, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are three marks, one on a large stone imbedded in the ground and two others at 2 and 4 feet respectively above it. The directions and distances of the circumjacent villages are:—Velugubanda N. by E., miles 2½; Palláchĕrla N.W., miles 2½; Kanavaram E. by S., miles 3¾; and Sríkrishnapatnam S. by E., miles 3½.

LIV. Pothkŏnda Hill Station, lat 17° 16′, long. 81° 47′—observed at in 1861—is on a high hill about 5 miles E. of the left bank of the Godávari river, 7 miles N. by E. of the large village of Raghudevapuram and 7½ miles W. of Gokavaram village and Police Station. It is in the lands of the village of Rámanmapalli, taluk Rajahmundry, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2·5 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Potulakŏnda E.N.E., mile ¾; Surrabaram E.S.E., miles 1½; Pĕddakŏndapúdi S.W. by S., miles 3½; Nĕllakota W.S.W., miles 3; and Chinarigandi N.W. by W., miles 1½.

LV. Lachmipuram Station, lat. 17° 0′, long. 81° 37′—observed at in 1861—is on the W. extremity of some high ground stretching about N.W. by W. for 4 miles. The E. extremity of which is of a gravelly nature, while that on which the station stands is sandy. The station is 4¾ miles E. of the town of Yĕrnagúdĕm on the high road from Ellore (Ĕllúr) to Kovúr on the Godávari, and 6 miles W. by N. of the large village of Chagallu. It is in the lands of the village of Lachmipuram, taluk Yĕrnagúdĕm, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are three marks, one on a large stone imbedded firmly in the sand and two others at 2½ and 4½ feet respectively above it. The directions and distances of the circumjacent villages are:—Lachmipuram N. by E., mile ½; Chinnayapálĕm W., mile ¾; Pallantla S.W. by W., miles 2; Chikkala S.S.E., miles 2½; and Devarapalli N.W. by N., miles 2½.

LVI. Adakŏnda Hill Station, lat. 17° 14′, long. 81° 32′—observed at in 1861—is on a spur at the southern extremity of the main range of hills about 10 miles W. by S. of the large village of Pallávaram on the Godávari river, and 5¾ miles S. by E. of Chintapalli. The station is in the lands of the village of Sagipád, taluk Yĕrnagúdĕm, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2½ feet above it imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Lankapalli W. by N., mile 1; Vírapagúdĕm W.S.W., miles 2; Kamayakunta S.W. by W., miles 2¾, Kovada S.S.W., miles 2½; and Suripillagúdĕm E. by N., miles 1¾.

LVII. Yĕdlagattu Hill Station, lat. 17° 1′, long. 81° 23′—observed at in 1861—is near the centre and on the highest part of a low range of hills extending some 20 miles in a N.E. and S.W. direction. The summit of the hill is flat-topped and covered with very thick jungle. The station is 7 miles N.W. from the large village of Nallachĕrla on the high road from Ellore to Yĕrnagúdĕm, and 4 miles S.E. of Lakkavaram. It is in the lands of the village of Ragapuram, taluk Yĕrnagúdĕm, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are three marks, one engraved on the rock *in sitú* and two others at 1½ and 3 feet respectively above it. The directions and distances are of the circumjacent villages are:—Ráyavapuram N.W. by N., miles 1½; Lachmipuram W., miles 1⅜; Pangidigúdĕm N.N.E., miles 3¼; and Rámsingavaram E.S.E., miles 2¼.

LVIII. Aupád Station, lat. 16° 53′, long. 81° 26′—observed at in 1861—is on a sandy ridge covered with high jungle 4½ miles S. by W. of the large village of Nallachĕrla on the road from Ellore to Yĕrnagúdĕm. It is in the lands of the village of Aupád, taluk Yĕrnagúdĕm, district Godávari.

The station consists of a platform of logs of wood enclosing a solid, circular and isolated pillar of masonry in which are four mark-stones, one imbedded flush with the upper surface of the pillar and others at 3, 5 and 7 feet respectively below it. The directions and distances of the circumjacent villages are:—Aupád N.E. by E., miles 2; Marellamudi N., miles 2½; Dubachĕrla N.W. by W., miles 3; Nallamadu S.W. by W., miles 1¾; and Rámachandrapuram W. by S., miles 1½.

LIX. Sudkŏnda Hill Station, lat, 16° 57′, long. 81° 15′—observed at in May and December 1861—is on a small, round, isolated hill 4½ miles S. of the large village of Kamavarapukota and ½ a mile W. of the road from Kamavarapukota to Rámanagúdĕm. It is in the lands of the village of Vadlapatlanutanam, taluk Ellore, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones, one imbedded in the upper surface of the pillar and the other 1½ feet below it at the ground level. When visited in December 1861, the pillar and annulus were found in perfect order and the mark had evidently not been tampered with. The directions and distances of the circumjacent villages are:—Vĕnkatakrishnapuram S.E. by E., miles 2; Vĕnkatapuram W.S.W., miles 2⅝; Rámanagúdĕm S.E. by S., miles 2⅞; Gundugolanukunta E.N.E., miles 2; and Vadlapatlanutanam N.N.W., mile 1.

LX. Parampúdi Hill Station, lat. 17° 13′, long. 81° 15′—observed at in May and December 1861—is on a low hill about 4 miles W. by N. of the large village of Ganapavaram, the same distance E. of Jelugumilli, and 5 miles N. of the large village of Taduvayi. The station is in the lands of the village of Parampúdi, taluk Yĕrnagúdĕm, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2½ feet above it on a stone imbedded flush with the upper surface of the pillar. When visited in December 1861, the mark had evidently not been tampered with. The directions and distances of the circumjacent villages are:—Rámanapálĕm W.S.W., miles 2⅝; Vírachĕttigúdĕm S.W. by W., miles 1⅞; Ganganagúdĕm S.E. by S., miles 2¼; Rantugúdĕm E. by S., miles 2¼; and Narnapuram N.E. by N., miles 1½.

LXI. Bandanchĕrla Hill Station, lat. 17° 4′ long. 81° 6′—observed at in 1861—is on a range of hills 5 miles E. by S. of the village of Rĕtachintalapúdi on the road from Ellore to Gummumet, and 4½ miles N.E. of Pragadavaram. It is in the lands of the village of Punukumadu, taluk Ellore, district Godávari.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Bandanchĕrla N.E. by E., miles 1¼; Vurlagúdĕm W., miles 2½; Ponukupád S., miles 1⅜; Narasapuram N.N.E., miles 3¼; and Ketavaram E., miles 3½.

LXII. Nágaldurgam Hill Station, lat. 17° 20′, long. 80° 58′—observed at in 1861—is on a high hill about 4 miles to the N.N.E. of the small village of Srírámpur, the road from which to Jaggavaram passes close under the hill. It is in taluk Khamam, Nizám's territories.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 2 feet above it on a stone imbedded flush with the upper surface of the pillar. The estimated directions and distances of the circumjacent villages are:—Nagupilli S.S.W., miles 5; Mukŏndapur S., miles 5; and Jaggavaram N., miles 2.

LXIII. Dudugat Hill Station, lat. 16° 46′, long. 80° 59′—observed at in 1862—is on a low ridge about 6½ miles E. by S. of Núzvíd, a large place and the residence of a petty rája, and 4 miles N.E. by N. of the Police Station of Gollapalli. The station is on the site of the old Topographical Survey station of Dudugat, the pile of stones of which was removed for the platform of the present station. It is in the lands of the village of Katrenipád, division Núzvíd, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 1·5 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Katrenipád N. by E., miles 2; Medichĕrla S.E., miles 3½; Anapanúrgúdĕm E., miles 3; and Rangapálĕm N.E. by N., miles 2.

LXIV. Inupráyi Hill Station, lat. 17° 8′, long. 80° 49′—observed at in 1861—is on a low, isolated hill locally called Inuprấyigattu. The hill is composed of iron stone. The station is on the site of an old Topographical Survey station, which was marked by the remains of a cairn of stones. It is in the lands of the village Vaimsúr, taluk Khamam, Nizám's territories.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones, one imbedded flush with the upper surface of the pillar and the other, a large one, 2 feet below it imbedded in the ground. The directions and distances of the following villages are:—Vemirĕddipalli S.W. by S., miles 5; Korlamanda S., miles 5; Tsanubanda S.S.E., miles 6½; and Yemsúr E., miles 1½.

LXV. Dálgattu Hill Station, lat. 16° 54′, long. 80° 51′—observed at in 1862—is on the highest of a group of hills at the northern extremity of a long range extending nearly N. and S. The station is about 3 miles S. by E. of the village of Vissanapet on the road from Madavaram to Tsanubanda, and 8 miles N.N.W. of Núzvíd. It is in the lands of the village of Kŏndavarava, division Vissanapet, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 1·8 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Ráyanapálĕm W., miles 3½; Kŏndavarava E. by N., miles 2; Ramanakkapet E. by S., miles 4¾; and Rĕddigúdĕm W. by S., miles 4¾.

LXVI. Yĕrragattu Hill Station, lat. 16° 40′, long. 80° 42′—observed at in 1862—is on a range of hills running from S.S.W. to N.N.E. about 6 miles S. by E. of the large village of Mailavaram, the residence of a rája, and 11½ miles N.N.E. of the town of Bĕzváda. It occupies the site of the old Topographical Survey station of Vĕlatúr, the platform of which was found. It is in the lands of the village of Vĕlatúr, taluk Bĕzváda, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 1·5 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Vĕlatúr W.N.W., miles 1½; Velagaler W.S.W., miles 4; Kuntamukala N.W. by W., miles 3; and Adivinekalam S.E. by E., miles 4½.

LXVII. Jammalavoidurgam Hill Station, lat. 16° 57′, long. 80° 38′—observed at in 1862—is on the summit of a hill on which are the ruins of an old fort, one of a group of hills at the northern extremity of a range extending N.N.E. and S.S.W. from Kŏndapalli near the Kistna river. It is an old Topographical Survey station and is in the lands of the village of Kŏndúr, division Vissanapet, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 1·6 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Annumallanka W.N.W., miles 4; Kŏndúr E. by N., miles 4; Narikempád S. by W., miles 2¼; and Repúdi E. by S., miles 5½.

LXVIII. Jujúrdurgam Hill Station, lat. 16° 42′, long. 80° 31′—observed at in 1862—is on a high hill on which are the ruins of an old fort 5¼ miles E. by N. of the village of Kanchakachĕrla on the road from Hyderabad to Bĕzváda. The W. face of the hill is a perfect precipice, and the station is built on a large granite rock on the verge of it about ¼ mile from the highest part of the hill. It is in the lands of the village of Jujúr, taluk Nandigáma, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 1·21 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Jujúr N.W., miles 4; Narasimharampálĕm W.N.W., miles 3; and Gottimukkala W. by S., miles 3½.

LXIX. Bĕzváda Hill Station, lat. 16° 31′, long. 80° 39′—observed at in 1862—is on the highest part of a long precipitous ridge immediately on the left bank of the Kistna river and about ½ mile N.W. of the town of Bĕzváda. A Revenue Survey pillar is at a distance of 14 yards from the station at an azimuth of 195°. The station is in the lands of the village of Bĕzváda, taluk Bĕzváda, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitú* and the other 0·46 of a foot above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Golapúdi N.W. by W., miles 1½; Vĕnkatapálĕm W.S.W., miles 2¾; and Vundavalli S. by W., miles 2.

LXX. Jŏnnalagadda Hill Station, lat. 16° 52′, long. 80° 21′—observed at in 1862—is on a low hill 5½ miles S.E. by E. of the village of Penuganchiprol on the right bank of the Muniyár river and 6¼ miles N.N.E. of Nandigáma on the road from Hyderabad to Bĕzváda. The hill is on the boundary line of the villages of Jŏnnalagadda and Ramirĕddipalli. One of the Revenue Survey boundary pillars is 24·4 feet at an azimuth of 51° from the station which is in the lands of the village of Jŏnnalagadda, taluk Nandigáma, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones one (a large stone) imbedded in the soil and the other 1·46 feet above it let in flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Jŏnnalagadda N.E. by E., miles 1½; Anigarlapád N.W., miles 2⅝; Gummadidúr W. by N., miles 1½; Ramirĕddipalli E.S.E., mile ⅝; and Magallu S., miles 3¼.

LXXI. Anantavaram Hill Station, lat. 16° 31′, long. 80° 28—observed at in 1862—is on a low hill, whose western face is very precipitous, about 3¾ miles S. by E. of the village of Vaikuntapuram on the right bank of the Kistna river, and 11 miles N.W. by W. of the large village of Mangalagiri on the road from Guntúr to Bĕzváda. It is in the lands of the village of Anantavaram, taluk Guntúr, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 1·5 feet above it on a stone imbedded flush with the upper of the pillar. The directions and distances of the circumjacent villages are:—Vadhanián N. by W., mile 1; Tullúr E. by N., miles 3; Anantavaram E.S.E., mile ⅝; and Karlapúdi S.W., miles 2.

LXXII. Chintalapád Station, lat. 16° 40′, long. 80° 17′—observed at in February and April 1862—is on rising ground about 3¼ miles N.E. of the village and police station of Pŏnnapalli on the left bank of the Kistna river, and 8 miles S.S.W. of the town of Nandigáma on the high road from Hyderabad to Bĕzváda. It is in the lands of the village of Chintalapád, taluk Nandigáma, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones one (a large stone) imbedded in the soil and the other 2·33 feet above it let in flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Patĕmpád W. by N., miles 1⅝; Turlapád N.N.E., miles 2⅝; Totaravulapád E.N.E., miles 2½; Chintalapád E. by S., miles 2¼; and Valadi S.W. by S., miles 2.

LXXIII. Lagadapád Station, lat. 16° 29′, long. 80° 17′—observed at in February and April 1862—is on high ground about 9 miles N.E. of the town of Sattĕnapalle on the high road from Hyderabad to Guntúr, and 7½ miles E.S.E. of the large village of Krosúr. It is in the lands of the village of Lagadapád, taluk Sattĕnapalle, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two mark-stones, one imbedded in the soil and the other 4 feet above it let in flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Lagadapád S.W. by W., mile ⅝; Kúrapád S.E., miles 1⅝; Hussenagram N. by W., miles 2; Gárapád N.W. by W., miles 2½; and Gujĕrlapúdi W. by N., miles 2½.

LXXIV. Gorantla Hill Station, lat. 16° 21′, long. 80° 29′—observed at in 1862—is on rock 12 feet above the general level of the summit of a low hill, consisting almost entirely of granite, 3⅓ miles nearly W. of the village of Kakane on the road from Guntúr to Bĕzváda, and 3½ miles N. by W. of the former town. The station is in the lands of the village of Gorantla, taluk Guntúr, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 1·5 feet above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Gorantla S.E., mile ¼; Vĕnĕgantla E., miles 2⅝; Kŏntepád S. by W., miles 2⅝; and Jŏnnalagadda N.N.E., miles 2¼.

LXXV. Chikri Hill Station, lat. 16° 36′, long. 80° 7′—observed at in 1862—is on the eastern point of the more northern of two low hills, 3¾ miles S.W. of the village of Chámaru and 5½ miles N.W. of that of Krosúr. The western point is higher and consists of a mass of granite with such limited space that the station could not be built on it. It is in the lands of the village of Kŏndúr, taluk Sattĕnapalle, district Kistna.

The station consists of a platform of stones and earth enclosing a solid, circular and isolated pillar of masonry in which are two marks, one engraved on the rock *in sitû* and the other 1·0 foot above it on a stone imbedded flush with the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Pĕddapálĕm E. by S., miles 1⅝; Kŏndúr S.S.W., miles 1½; Dŏdler S. by W., miles 3¼; and Turakapalle N.N.E., miles 2⅝.

W. H. COLE,
In charge Computing Office.

April, 1886.

MADRAS MERIDIONAL AND COAST SERIES.

PRINCIPAL TRIANGULATION. OBSERVED ANGLES.

At XII (Kándágatla)

March 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on XV (Adáligat) 275° 22′	95° 22′	354° 34′	174° 38′	73° 47′	253° 47′	152° 57′	332° 57′	232° 10′	52° 9′	*M* = Mean of Groups; *w* = Relative Weight; *C* = Concluded Angle
XV (Adáligat) and I (Anantagiri)	″ *h* 40·76	″ *h* 41·74	″ *l* 40·80	″ *l* 41·42	″ *h* 40·92	″ *h* 40·40	″ *l* 40·78	″ *l* 40·58	″ *l* 39·02	″ *l* 42·48	$M = 40''\cdot88$
	h 41·14	*h* 41·24	*l* 40·26	*l* 41·30	*h* 40·32	*h* 41·62	*l* 40·88	*l* 41·36	*l* 39·78	*l* 41·60	$w = 17\ \cdot50$
	h 42·10	*l* 41·88	*l* 40·00	*l* 39·90	*h* 41·06	*h* 40·92	*l* 40·70	*l* 41·24	*l* 38·96	*l* 41·28	$\frac{1}{w} = 0\ \cdot06$
	41·33	41·62	40·35	40·87	40·77	40·98	40·79	41·06	39·25	41·79	$C = 49°\ 3'\ 40''\cdot88$
I (Anantagiri) and II (Niálamari)	*h* 32·78	*h* 34·20	*l* 33·16	*l* 33·64	*h* 32·08	*h* 32·64	*l* 33·68	*l* 33·28	*l* 33·30	*l* 31·20	$M = 32''\cdot94$
	h 32·60	*h* 34·66	*l* 33·08	*l* 33·50	*h* 32·72	*h* 32·44	*l* 32·94	*l* 32·26	*l* 33·32	*l* 32·22	$w = 20\ \cdot80$
	h 31·70	*l* 33·16	*l* 32·74	*l* 34·68	*h* 33·00	*h* 32·38	*l* 33·12	*l* 32·10	*l* 32·20	*l* 33·42	$\frac{1}{w} = 0\ \cdot05$
	32·36	34·01	32·99	33·94	32·60	32·49	33·25	32·55	32·94	32·28	$C = 35°\ 35'\ 32''\cdot94$

Note.—Stations XII and XV appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

At XV (Adáligat)

March 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on I (Anantagiri) 132° 4′	312° 4′	211° 16′	31° 15′	290° 28′	110° 28′	9° 40′	189° 40′	88° 52′	268° 51′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
I (Anantagiri) and II (Niálamari)	h 46·08	h 45·76	l 44·82	l 45·86	l 46·98	l 46·16	h 46·04	l 47·92	l 46·70	l 47·82	$M = 46''\cdot58$
	h 47·62	l 45·60	l 47·74	l 46·70	l 46·52	l 46·24	h 45·88	l 47·52	l 46·28	l 48·04	$w = 15\cdot20$
	h 45·68	l 46·00	l 47·44	l 46·04	l 46·60	l 45·56	h 45·94	l 48·44	l 45·76	l 47·58	$\frac{1}{w} = 0\cdot07$
	46·46	45·79	46·67	46·20	46·70	45·99	45·95	47·96	46·25	47·81	$C = 40° 12' 46''\cdot58$
II (Niálamari) and XII (Kándágatla)	h 43·88	h 44·16	l 44·82	l 43·84	l 43·56	l 43·90	h 42·38	l 41·36	l 43·74	l 42·74	$M = 43''\cdot33$
	h 43·58	l 43·64	l 43·76	l 43·18	l 43·86	l 43·28	h 42·58	l 41·76	l 44·22	l 45·56	$w = 13\cdot74$
	h 43·76	l 42·90	l 42·84	l 43·36	l 43·74	l 43·50	h 43·32	l 40·68	l 43·68	l 43·36	$\frac{1}{w} = 0\cdot07$
										l 42·62	
	43·74	43·57	43·81	43·46	43·72	43·56	42·76	41·27	43·88	43·57	$C = 45° 32' 43''\cdot33$

At I (Anantagiri)

March 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on III (Miádarsál) 180° 13′	0° 13′	259° 24′	79° 24′	338° 36′	158° 36′	57° 48′	237° 48′	136° 59′	316° 59′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
III (Miádarsál) and IV (Sárangapalle)	l 14·42	l 17·10	l 17·52	l 17·90	l 18·88	l 17·24	l 16·64	l 15·34	h 16·36	h 15·34	$M = 16''\cdot61$
	l 15·26	l 15·28	l 17·94	l 17·34	l 16·70	l 17·70	l 17·28	l 14·40	h 17·24	h 15·92	$w = 7\cdot30$
	l 15·84	l 16·54	l 18·88	l 16·56	l 17·88	l 17·46	l 17·02	l 14·86	h 16·24	h 15·34	$\frac{1}{w} = 0\cdot14$
	15·17	16·31	18·11	17·27	17·82	17·47	16·98	14·87	16·61	15·53	$C = 41° 58' 16''\cdot61$
IV (Sárangapalle) and II (Niálamari)	l 12·24	l 11·44	l 9·36	l 10·20	l 9·14	l 9·96	l 10·56	l 10·90	h 10·64	h 10·18	$M = 10''\cdot45$
	l 12·18	l 11·42	l 10·04	l 10·02	l 9·84	l 10·00	l 9·82	l 11·80	h 9·68	h 11·06	$w = 13\cdot20$
	l 11·42	l 11·48	l 9·70	l 9·48	l 9·28	l 9·00	l 10·40	l 11·10	4 10·92	h 10·30	$\frac{1}{w} = 0\cdot08$
	11·95	11·45	9·70	9·90	9·42	9·65	10·26	11·27	10·41	10·51	$C = 52° 33' 10''\cdot45$
II (Niálamari) and XII (Kándágatla)	h 51·24	h 51·02	l 52·70	h 52·68	l 51·98	l 51·54	l 51·12	l 51·66	h 51·10	h 53·60	$M = 52''\cdot17$
	h 53·54	h 52·26	l 52·72	l 53·08	l 52·12	l 51·14	l 52·04	l 52·90	h 51·68	h 52·96	$w = 22\cdot20$
	h 51·72	h 52·74	l 52·34	l 53·06	l 53·10	l 50·80	l 51·38	l 52·58	h 52·22	h 52·10	$\frac{1}{w} = 0\cdot05$
	52·17	52·01	52·59	52·94	52·40	51·16	51·51	52·38	51·67	52·89	$C = 40° 5' 52''\cdot17$

NOTE.—Stations XII and XV appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

At I (Anantagiri)—(*Continued*).

Angle between	Circle readings, telescope being set on III (Miádarsál) 180° 13′	0° 13′	259° 24′	79° 24′	338° 36′	158° 36′	57° 48′	237° 48′	136° 59′	316° 59′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XII (Kándágatla) and XV (Adáligat)	″ h 52·56 h 50·28 h 51·98	″ h 53·12 h 52·72 h 51·58	″ l 51·44 l 51·94 l 52·00	″ h 52·28 l 50·82 l 51·26	″ l 51·82 l 51·50 l 50·78	″ l 52·76 l 51·94 l 53·26	″ l 53·16 l 51·98 l 52·26	″ l 53·24 l 52·72 l 51·56	″ h 52·32 h 52·82 h 50·58	″ h 51·38 h 52·64 h 52·52	$M = 52''\cdot04$ $w = 26\cdot30$ $\frac{1}{w} = 0\cdot04$
	51·61	52·47	51·79	51·45	51·37	52·65	52·47	52·51	51·91	52·18	$C = 45^\circ 10' 52''\cdot04$

At II (Niálamari)

April 1868; *observed by Mr. G. Shelverton with Troughton and Simms' 36-inch Theodolite.*

Angle between	Circle readings, telescope being set on XII (Kándágatla) 0° 1′	180° 1′	79° 12′	259° 12′	158° 24′	338° 24′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XII (Kándágatla) and XV (Adáligat)	″ h 4·76 h 4·18 h 5·02	″ l 7·12 l 5·88 l 5·68	″ l 4·88 l 4·94 l 4·82	″ l 5·18 l 4·96 l 5·78	″ h 5·64 h 3·74 h 4·40	″ h 5·86 l 3·72 l 4·64	″ l 3·88 l 4·92 l 4·06	″ l 6·28 l 5·86 l 5·74	″ l 4·08 l 5·00 l 5·02	″ l 5·20 l 4·56 l 5·48	$M = 5''\cdot04$ $w = 20\cdot80$ $\frac{1}{w} = 0\cdot05$
	4·65	6·23	4·88	5·31	4·59	4·74	4·29	5·96	4·70	5·08	$C = 49^\circ 48' 5''\cdot04$
XV (Adáligat) and I (Anantagiri)	h 33·20 h 32·24 h 32·22	l 29·22 l 30·94 l 30·04	l 30·74 l 32·18 l 31·66	l 32·60 l 31·56 l 29·88	h 32·64 h 33·70 h 32·18	h 31·80 l 29·58 l 31·16	l 33·18 l 32·70 l 33·86	l 31·56 l 32·28 l 31·98	l 34·32 l 33·26 l 33·82	l 34·36 l 34·06 l 33·68	$M = 32''\cdot22$ $w = 5\cdot50$ $\frac{1}{w} = 0\cdot18$
	32·55	30·07	31·53	31·35	32·84	30·85	33·25	31·94	33·80	34·03	$C = 54^\circ 30' 32''\cdot22$
I (Anantagiri) and III (Miádarsál)	h 43·36 h 43·86 h 43·52	l 44·40 l 44·08 l 44·24	l 44·30 l 43·74 l 43·40	l 44·06 l 43·88 l 44·56	h 42·02 h 43·40 h 42·76	h 45·16 l 46·04 l 44·50	l 43·76 l 44·14 l 43·72	l 44·98 l 43·34 l 43·64	l 43·58 l 43·16 l 42·22	l 41·50 l 42·66 l 42·18	$M = 43''\cdot67$ $w = 11\cdot90$ $\frac{1}{w} = 0\cdot08$
	43·58	44·24	43·81	44·17	42·73	45·23	43·87	43·99	42·99	42·11	$C = 51^\circ 27' 43''\cdot67$
III (Miádarsál) and IV (Sárangapalle)	h 53·46 h 54·08 h 53·38	l 54·78 l 54·26 l 54·30	l 54·90 l 55·26 l 55·72	l 54·30 l 55·30 l 55·72	h 54·54 h 53·40 h 54·66	h 53·44 h 55·34 l 55·10	l 53·92 l 54·02 l 54·48	l 53·86 l 54·70 l 54·42	l 52·98 l 53·66 l 54·08	l 54·26 l 53·38 l 54·54	$M = 54''\cdot34$ $w = 25\cdot60$ $\frac{1}{w} = 0\cdot04$
	53·64	54·45	55·29	55·11	54·20	54·63	54·14	54·33	53·57	54·06	$C = 39^\circ 2' 54''\cdot34$

Note.—Stations XII and XV appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

At III (Miádarsál)

April 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on VI (Voruvakallu) 0° 1'	180° 1'	79° 12'	259° 12'	158° 25'	338° 25'	237° 36'	57° 36'	316° 48'	136° 48'	M = Mean of Groups w = Relative Weight C = Concluded Angle
	"	"	"	"	"	"	"	"	"	"	
VI (Voruvakallu) and V (Kachalboru)	h 23·94	h 21·36	h 22·90	h 22·64	l 24·44	l 23·08	l 24·62	l 23·72	l 24·56	l 26·36	$M = 23''·40$
	h 22·68	h 21·30	h 21·28	h 23·38	l 24·24	l 22·64	l 23·32	l 25·20	l 23·92	l 23·78	$w = 6·41$
	h 22·10	h 21·10	h 21·94	h 23·00	l 23·60	l 23·38	l 22·74	l 24·60	l 24·56	l 24·56	$\frac{1}{w} = 0·16$
										l 26·18	
	22·91	21·25	22·04	23·01	24·09	23·03	23·56	24·51	24·35	25·22	$C = 66° 8' 23''·40$
V (Kachalboru) and IV (Sárangapalle)	h 38·28	h 39·22	h 38·68	h 37·94	l 38·56	l 38·04	l 38·34	l 37·12	l 37·42	l 34·36	$M = 37''·81$
	h 38·76	h 38·86	h 38·14	h 37·40	l 37·04	l 39·36	l 38·46	l 37·14	l 37·72	l 35·94	$w = 16·24$
	h 38·28	h 38·26	h 37·52	h 37·10	l 37·34	l 37·28	l 37·98	l 37·22	l 36·56	l 38·04	$\frac{1}{w} = 0·06$
										l 38·72	
	38·44	38·78	38·11	37·48	37·65	38·23	38·26	37·16	37·23	36·77	$C = 65° 3' 37''·80$
IV (Sárangapalle) and II (Niálamari)	h 49·80	h 49·68	h 50·44	h 49·56	l 50·84	h 51·12	h 48·70	h 51·84	h 49·58	h 51·12	$M = 50''·65$
	h 49·94	h 50·66	h 51·12	h 50·28	l 51·60	h 51·04	h 51·94	h 51·92	h 50·46	h 51·88	$w = 12·70$
	h 52·04	h 50·26	h 48·56	h 50·42	l 50·78	h 50·06	l 50·58	h 51·60	h 48·64	h 52·88	$\frac{1}{w} = 0·08$
	50·59	50·20	50·04	50·09	51·07	50·74	50·41	51·79	49·56	51·96	$C = 47° 44' 50''·65$
II (Niálamari) and I (Anantagiri)	h 52·34	h 50·78	h 52·24	h 52·68	l 51·48	h 50·38	h 52·38	h 49·74	h 49·18	h 51·60	$M = 51''·63$
	h 51·86	h 50·76	h 53·06	h 53·56	l 52·14	h 50·48	h 51·00	h 52·14	h 50·60	h 51·72	$w = 11·90$
	h 50·28	h 52·36	h 53·90	h 52·36	l 52·02	h 51·50	h 52·00	h 51·54	h 52·10	h 50·74	$\frac{1}{w} = 0·08$
	51·49	51·30	53·07	52·87	51·88	50·79	51·79	51·14	50·63	51·35	$C = 34° 0' 51''·63$

At IV (Sárangapalle)

April 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on II (Niálamari) 194° 55'	14° 55'	274° 7'	94° 7'	353° 18'	173° 18'	72° 30'	252° 30'	151° 41'	331° 41'	M = Mean of Groups w = Relative Weight C = Concluded Angle
	"	"	"	"	"	"	"	"	"	"	
II (Niálamari) and I (Anantagiri)	h 15·10	l 13·60	l 15·16	l 14·88	l 13·36	l 12·88	l 14·50	l 12·96	l 14·22	l 15·36	$M = 14''·26$
	h 14·98	l 14·32	l 14·84	l 13·96	l 13·76	l 14·42	l 14·58	l 13·76	l 14·98	l 15·20	$w = 20·00$
	h 13·90	l 14·44	l 14·60	l 14·18	l 12·62	l 13·38	l 14·44	l 13·32	l 14·92	l 15·06	$\frac{1}{w} = 0·05$
	14·66	14·12	14·87	14·34	13·25	13·56	14·51	13·35	14·71	15·21	$C = 36° 56' 14''·26$

At IV (Sárangapalle)—(*Continued*).

Angle between	Circle readings, telescope being set on II (Niálamari) 194° 55′	14° 55′	274° 7′	94° 7′	353° 18′	173° 18′	72° 30′	252° 30′	151° 41′	331° 41′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
I (Anantagiri)	*h* 4·42	*l* 4·92	*l* 2·18	*l* 3·62	*l* 4·32	*l* 4·56	*l* 4·88	*l* 5·16	*l* 4·32	*l* 2·54	$M = 4''\cdot05$
and	*h* 5·80	*l* 4·20	*l* 3·56	*l* 3·82	*l* 4·22	*l* 2·62	*l* 4·30	*l* 4·34	*l* 3·46	*l* 2·80	$w = 14\cdot30$
III (Miádarsál)	*h* 5·46	*l* 4·36	*l* 3·78	*l* 3·84	*l* 4·74	*l* 2·94	*l* 4·66	*l* 4·66	*l* 4·22	*l* 2·70	$\frac{1}{w} = 0\cdot07$
	5·23	4·49	3·17	3·76	4·43	3·37	4·61	4·72	4·00	2·68	$C = 56^\circ\ 16'\ 4''\cdot05$
III (Miádarsál)	*h* 32·18	*l* 31·74	*l* 32·68	*l* 33·04	*l* 32·24	*l* 32·16	*l* 31·16	*l* 31·12	*l* 32·18	*l* 33·98	$M = 32''\cdot24$
and	*h* 31·66	*l* 31·86	*l* 31·40	*l* 33·60	*l* 32·18	*l* 33·42	*l* 32·38	*l* 30·64	*l* 31·84	*l* 33·52	$w = 14\cdot50$
V (Kachalboru)	*h* 31·24	*l* 31·12	*l* 32·26	*l* 32·96	*l* 32·74	*l* 32·56	*l* 32·26	*l* 31·42	*l* 31·88	*l* 33·72	$\frac{1}{w} = 0\cdot07$
	31·69	31·57	32·11	33·20	32·39	32·71	31·93	31·06	31·97	33·74	$C = 42^\circ\ 30'\ 32''\cdot24$
V (Kachalboru)	*h* 52·54	*l* 54·72	*l* 55·76	*l* 54·32	*l* 55·22	*l* 53·74	*l* 55·40	*l* 55·76	*l* 54·70	*l* 54·16	$M = 54''\cdot47$
and	*h* 51·06	*l* 55·28	*l* 55·02	*l* 52·80	*l* 54·20	*l* 54·70	*l* 54·24	*l* 55·76	*l* 54·94	*l* 54·16	$w = 7\cdot40$
VIII (Mániam)	*h* 51·42	*l* 56·66	*l* 54·92	*l* 54·60	*l* 54·10	*l* 54·70	*l* 54·18	*l* 55·14	*l* 55·18	*l* 54·86	$\frac{1}{w} = 0\cdot14$
	51·67	55·55	55·23	53·91	54·51	54·38	54·61	55·55	54·94	54·39	$C = 29^\circ\ 23'\ 54''\cdot47$

At V (Kachalboru)

April 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on VIII (Mániam) 0° 1′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 48′	136° 47′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VIII (Mániam)	*h* 29·38	*h* 27·48	*l* 27·32	*l* 28·66	*l* 28·80	*l* 29·28	*h* 28·40	*h* 30·00	*h* 30·14	*l* 28·40	$M = 28''\cdot68$
and	*h* 29·54	*h* 26·78	*l* 28·98	*l* 27·62	*l* 28·64	*l* 28·92	*h* 28·44	*h* 30·74	*l* 27·28	*l* 28·56	$w = 14\cdot10$
IV (Sárangapalle)	*h* 29·64	*h* 27·74	*l* 29·44	*l* 29·30	*l* 28·08	*l* 28·20	*h* 28·56	*h* 30·04	*l* 28·34	*l* 27·80	$\frac{1}{w} = 0\cdot07$
	29·52	27·33	28·58	28·53	28·51	28·80	28·47	30·26	28·59	28·25	$C = 96^\circ\ 44'\ 28''\cdot68$
IV (Sárangapalle)	*h* 48·50	*h* 52·64	*l* 51·26	*l* 49·46	*l* 51·78	*l* 50·64	*h* 49·88	*h* 49·04	*h* 50·32	*l* 51·50	$M = 50''\cdot79$
and	*h* 51·34	*h* 52·60	*l* 50·66	*l* 50·72	*l* 51·04	*l* 51·40	*h* 50·54	*h* 49·98	*l* 51·08	*l* 51·08	$w = 10\cdot90$
III (Miádarsál)	*h* 50·16	*h* 51·42	*l* 50·56	*l* 48·48	*l* 52·74	*l* 50·92	*h* 50·14	*h* 50·70	*l* 51·04	*l* 51·98	$\frac{1}{w} = 0\cdot09$
	50·00	52·22	50·83	49·55	51·85	50·99	50·19	49·91	50·81	51·52	$C = 72^\circ\ 25'\ 50''\cdot79$

At V (Kachalboru)—(*Continued*).

Angle between	Circle readings, telescope being set on VIII (Mániam) 0° 1′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 48′	136° 47′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
III (Miádarsál) and VI (Voruvakallu)	″ *h* 3·64 *h* 2·74 *h* 2·86	″ *h* 1·20 *h* 1·92 *h* 1·58	″ *l* 2·48 *l* 2·70 *l* 2·26	″ *l* 2·76 *l* 3·38 *l* 4·58	″ *l* 2·50 *l* 3·24 *l* 2·26	″ *l* 4·02 *l* 2·46 *l* 4·90	″ *h* 3·88 *h* 4·38 *h* 3·56	″ *h* 1·88 *h* 4·14 *h* 2·90	″ *h* 0·46 *l* 1·68 *l* 2·42	″ *l* 3·06 *l* 3·74 *l* 3·50	$M = 2''·90$ $w = 11·60$ $\frac{1}{w} = 0·09$
	3·08	1·57	2·48	3·57	2·67	3·79	3·94	2·97	1·52	3·43	$C = 43° 28′ 2''·90$
VI (Voruvakallu) and VII (Dhúlipalla)	*h* 12·52 *h* 9·62 *h* 9·76	*h* 11·28 *h* 10·32 *h* 10·80	*l* 8·68 *l* 9·76 *l* 9·62	*l* 9·58 *l* 9·08 *l* 7·96	*l* 7·52 *l* 8·76 *l* 8·34	*l* 8·94 *l* 10·50 *l* 8·08	*h* 10·44 *h* 8·34 *h* 10·32	*h* 11·40 *h* 8·94 *h* 8·38	*h* 9·58 *l* 10·18 *l* 9·88	*l* 7·28 *l* 7·96 *l* 7·88	$M = 9''·39$ $w = 8·50$ $\frac{1}{w} = 0·12$
	10·63	10·80	9·35	8·87	8·21	9·17	9·70	9·57	9·88	7·71	$C = 59° 52′ 9''·39$
VII (Dhúlipalla) and VIII (Mániam)	*h* 23·92 *h* 26·88 *h* 27·12 *h* 27·36	*h* 27·76 *h* 28·64 *h* 26·58	*l* 28·90 *l* 28·12 *l* 28·82	*l* 29·76 *l* 28·86 *l* 28·76	*l* 29·20 *l* 28·54 *l* 29·16	*l* 27·08 *l* 26·66 *l* 27·64	*h* 27·80 *h* 28·56 *h* 26·56	*h* 28·38 *h* 29·08 *h* 28·94	*h* 29·64 *l* 28·42 *l* 28·66	*l* 30·22 *l* 29·82 *l* 28·90	$M = 28''·28$ $w = 7·93$ $\frac{1}{w} = 0·13$
	26·32	27·66	28·61	29·13	28·97	27·13	27·64	28·80	28·91	29·65	$C = 87° 29′ 28''·27$

At VI (Voruvakallu)

April 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on VII (Dhúlipalla) 0° 2′	180° 2′	79° 12′	259° 12′	158° 24′	338° 24′	237° 36′	57° 36′	316° 49′	136° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
VII (Dhúlipalla) and V (Kachalboru)	″ *h* 58·16 *l* 56·28 *l* 56·82	″ *l* 56·94 *l* 57·38 *l* 57·36	″ *l* 56·96 *l* 57·28 *l* 57·24	″ *l* 58·32 *l* 57·76 *l* 58·56	″ *l* 58·28 *l* 57·58 *l* 58·04	″ *l* 58·14 *l* 57·34 *l* 58·20	″ *l* 57·56 *l* 57·80 *l* 57·70	″ *l* 57·00 *l* 57·08 *l* 57·20	″ *l* 56·76 *l* 55·60 *l* 56·64	″ *l* 57·46 *l* 58·06 *l* 57·98	$M = 57''·45$ $w = 27·00$ $\frac{1}{w} = 0·04$
	57·09	57·23	57·16	58·21	57·97	57·89	57·69	57·09	56·33	57·83	$C = 41° 54′ 57''·45$
V (Kachalboru) and III (Miádarsál)	*h* 35·30 *h* 36·60 *l* 34·72	*l* 35·36 *l* 34·80 *l* 34·74	*l* 34·26 *l* 34·02 *l* 34·72	*l* 35·38 *l* 35·26 *l* 34·84	*l* 33·22 *l* 33·74 *l* 33·66	*l* 35·10 *l* 34·72 *l* 34·28	*l* 34·78 *l* 35·24 *l* 35·62	*l* 33·92 *l* 34·08 *l* 33·94	*l* 35·04 *l* 35·64 *l* 34·98	*l* 34·76 *l* 33·98 *l* 34·80	$M = 34''·72$ $w = 22·70$ $\frac{1}{w} = 0·04$
	35·54	34·97	34·33	35·16	33·54	34·70	35·21	33·98	35·22	34·51	$C = 70° 23′ 34''·72$

At VII (Dhúlipalla)

**December* 1863; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

†*April* 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on X (Ádamsáb)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	120° 20′	300° 21′	199° 32′	19° 33′	278° 44′	98° 45′	357° 56′	177° 57′	77° 8′	257° 9′	
* X (Ádamsáb) and IX (Kotapa)	″ *l* 47·66 *l* 48·06	″ *l* 44·78 *l* 46·06	″ *l* 44·46 *l* 43·36	″ *l* 46·66 *l* 45·20	″ *l* 46·74 *l* 46·56	″ *l* 46·88 *l* 44·90	″ *l* 46·18 *l* 45·82	″ *l* 43·76 *l* 43·24	″ *l* 45·38 *l* 45·84	″ *l* 46·46 *l* 46·98	$M = 45''{\cdot}75$ $w = 5\ {\cdot}60$ $\frac{1}{w} = 0\ {\cdot}18$
	47·86	45·42	43·91	45·93	46·65	45·89	46·00	43·50	45·61	46·72	$C = 57°\ 9'\ 45''{\cdot}75$
* IX (Kotapa) and VIII (Mániam)	*l* 55·44 *l* 52·84 *l* 55·82	*l* 55·88 *l* 56·38	*l* 55·44 *l* 55·80	*l* 54·90 *l* 56·14	*l* 54·96 *l* 55·06	*l* 54·90 *l* 54·96	*l* 56·46 *l* 55·34	*l* 56·70 *l* 57·04	*l* 54·72 *l* 54·52	*l* 55·98 *l* 54·90	$M = 55''{\cdot}47$ $w = 14\ {\cdot}95$ $\frac{1}{w} = 0\ {\cdot}07$
	54·70	56·13	55·62	55·52	55·01	54·93	55·90	56·87	54·62	55·44	$C = 63°\ 9'\ 55''{\cdot}46$
	Circle readings, telescope being set on VIII (Mániam)										
	234° 41′	54° 40′	313° 50′	133° 50′	33° 3′	213° 3′	112° 16′	292° 15′	191° 28′	11° 28′	
† VIII (Mániam) and V (Kachalboru)	″ *h* 56·12 *l* 57·06 *l* 57·90	″ *l* 58·48 *l* 58·08 *l* 58·34	″ *l* 57·70 *l* 57·76 *l* 58·28	″ *l* 57·28 *l* 58·18 *l* 57·96	″ *l* 57·06 *l* 57·94 *l* 58·54	″ *l* 57·84 *l* 58·10 *l* 56·90	″ *h* 58·16 *h* 58·74 *h* 59·64	″ *h* 61·04 *l* 62·34 *l* 60·10	″ *l* 56·34 *l* 57·84 *l* 57·88	″ *l* 57·72 *l* 57·14 *l* 56·74	$M = 58''{\cdot}11$ $w = 6\ {\cdot}50$ $\frac{1}{w} = 0\ {\cdot}15$
	57·03	58·30	57·91	57·81	57·85	57·61	58·85	61·16	57·35	57·20	$C = 52°\ 25'\ 58''{\cdot}11$
† V (Kachalboru) and (Referring Mark)	*h* 63·42 *l* 63·82 *l* 63·02	*l* 63·00 *l* 62·88 *l* 62·48	*l* 64·00 *l* 62·60 *l* 63·94	*l* 63·04 *l* 62·12 *l* 62·50	*l* 61·96 *l* 61·60 *l* 61·50	*l* 62·06 *l* 62·12 *l* 62·36	*h* 62·08 *h* 61·54 *h* 60·36	*h* 59·48 *l* 60·42 *l* 62·28	*l* 63·00 *l* 62·58 *l* 64·54	*l* 62·24 *l* 62·98 *l* 62·92	$M = 62''{\cdot}43$ $w = 10\ {\cdot}00$ $\frac{1}{w} = 0\ {\cdot}10$
	63·42	62·79	63·51	62·55	61·69	62·18	61·33	60·73	63·37	62·71	$C = 72°\ 55'\ 2''{\cdot}43$
† V (Kachalboru) and VI (Voruvakallu)	*h* 52·52 *l* 55·18 *l* 53·60	*l* 53·80 *l* 53·94 *l* 52·90	*l* 54·68 *l* 53·66 *l* 53·70	*l* 52·98 *l* 52·14 *l* 53·28	*l* 53·80 *l* 52·98 *l* 52·92	*l* 55·12 *l* 54·32 *l* 54·94	*h* 52·86 *h* 53·38 *h* 52·32	*h* 50·14 *l* 51·50 *l* 52·84	*l* 54·84 *l* 55·78 *l* 57·02	*l* 54·76 *l* 54·14 *l* 54·66	$M = 53''{\cdot}69$ $w = 6\ {\cdot}10$ $\frac{1}{w} = 0\ {\cdot}16$
	53·77	53·55	54·01	52·80	53·23	54·79	52·85	51·49	55·88	54·52	$C = 78°\ 12'\ 53''{\cdot}69$

At VIII (Mániam)

**December* 1863; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

†*April* 1868; *observed by Mr. G. Shelverton with Troughton and Simms'* 36-*inch Theodolite.*

Angle between	Circle readings, telescope being set on IV (Sárangapalle) 0° 1′	180° 0′	79° 12′	259° 12′	158° 24′	338° 24′	237° 36′	57° 36′	316° 49′	136° 48′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
† IV (Sárangapalle) and V (Kachalboru)	″ h 37·44 h 38·22 h 38·36	″ h 37·78 h 36·90 h 37·32	″ h 40·46 h 38·10 h 39·96	″ h 38·94 l 39·36 l 39·24	″ l 38·22 l 38·06 l 38·26	″ l 38·64 l 38·04 l 37·96	″ l 40·28 l 38·74 l 38·32	″ l 38·68 l 38·98 l 39·50	″ l 37·94 l 37·94 l 37·18	″ l 38·76 l 37·40 l 38·40	*M* = 38″·45 *w* = 16·40 $\frac{1}{w}$ = 0·06
	38·01	37·33	39·51	39·18	38·18	38·21	39·11	39·05	37·69	38·19	*C* = 53° 51′ 38″·45
† V (Kachalboru) and VII (Dhúlipalla)	h 33·92 h 34·22 h 32·84	h 33·72 h 34·30 h 33·62	h 32·14 h 34·04 h 32·50	h 33·96 h 34·66 l 33·00	l 35·44 l 36·48 l 36·12	l 35·24 l 34·92 l 34·86	l 33·84 l 34·34 l 34·86	l 35·18 l 34·36 l 33·76	l 33·78 l 34·10 l 34·98	l 34·92 l 35·62 l 34·96	*M* = 34″·36 *w* = 11·60 $\frac{1}{w}$ = 0·09
	33·66	33·88	32·89	33·87	36·01	35·01	34·35	34·43	34·29	35·17	*C* = 40° 4′ 34″·36

Angle between	Circle readings, telescope being set on VII (Dhúlipalla) 138° 28′	318° 28′	217° 40′	37° 40′	296° 52′	116° 52′	16° 4′	196° 4′	95° 16′	275° 16′	
* VII (Dhúlipalla) and IX (Kotapa)	″ l 34·02 l 32·84	″ l 32·36 l 32·64	″ l 33·48 l 32·38	″ l 31·06 l 32·20	″ l 33·90 l 34·78	″ l 34·20 l 32·58	″ l 34·14 l 31·74 l 32·34	″ l 32·54 h 30·62	″ h 33·62 h 32·72	″ h 33·38 h 34·26	*M* = 32″·95 *w* = 9·92 $\frac{1}{w}$ = 0·10
	33·43	32·50	32·93	31·63	34·34	33·39	32·74	31·58	33·17	33·82	*C* = 72° 12′ 32″·95
* IX (Kotapa) and XI (Yĕrrakŏnda)	l 27·10 l 26·72	l 28·08 l 28·02	l 26·48 l 26·66	l 28·26 l 26·46	l 27·38 l 26·76	l 23·98 l 25·46	l 26·22 l 26·56	l 27·06 h 28·10	h 25·88 h 26·38	h 25·48 h 26·90	*M* = 26″·70 *w* = 10·05 $\frac{1}{w}$ = 0·10
	26·91	28·05	26·57	27·36	27·07	24·72	26·39	27·58	26·13	26·19	*C* = 66° 14′ 26″·70

At IX (Kotapa)

December 1863; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VII (Dhúlipalla) 0° 1′	180° 2′	79° 13′	259° 14′	158° 25′	338° 26′	237° 37′	57° 38′	316° 49′	136° 49′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
VII (Dhúlipalla) and X (Ádamsáb)	″ l 15·60 l 14·50	″ l 14·42 l 14·84	″ h 13·46 h 14·84	″ l 14·56 l 16·96 l 16·48	″ l 14·74 l 13·54	″ l 16·14 l 15·42	″ h 14·02 h 14·42	″ l 15·40 l 15·16	″ l 16·34 l 16·74	″ l 15·22 l 13·50	*M* = 15″·02 *w* = 10·83 $\frac{1}{w}$ = 0·09
	15·05	14·63	14·15	16·00	14·14	15·78	14·22	15·28	16·54	14·36	*C* = 56° 53′ 15″·03

At IX (Kotapa)—(*Continued*).

Angle between	Circle readings, telescope being set on VII (Dhúlipalla)										*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	0° 1′	180° 2′	79° 13′	259° 14′	158° 25′	338° 26′	237° 37′	57° 38′	316° 49′	136° 49′	
X (Ádamsáb) and XII (Pálapáru)	″ *l* 50·84 *l* 49·92	″ *l* 51·88 *l* 50·28	″ *h* 51·02 *h* 50·24	″ *l* 51·08 *l* 50·74	″ *l* 52·58 *l* 53·16	″ *l* 52·58 *l* 51·70	″ *h* 49·56 *h* 50·70	″ *l* 51·56 *l* 51·00	″ *l* 49·94 *l* 49·74	″ *l* 51·70 *l* 51·74	$M = 51''\cdot10$ $w = 10\cdot30$ $\frac{1}{w} = 0\cdot10$
	50·38	51·08	50·63	50·91	52·87	52·14	50·13	51·28	49·84	51·72	$C = 45° 51' 51''\cdot10$
XII (Pálapáru) and XIII (Babbĕpalle)	*l* 17·18 *l* 18·42	*l* 17·26 *l* 17·94	*h* 17·86 *h* 15·82 *h* 17·06	*l* 15·50 *l* 16·22	*l* 16·44 *l* 15·38	*l* 16·88 *l* 16·96	*h* 15·02 *h* 16·64	*h* 16·18 *l* 17·76	*l* 19·16 *l* 17·46	*l* 16·64 *l* 17·84	$M = 16''\cdot93$ $w = 10\cdot64$ $\frac{1}{w} = 0\cdot09$
	17·80	17·60	16·91	15·86	15·91	16·92	15·83	16·97	18·31	17·24	$C = 43° 20' 16''\cdot93$
XIII (Babbĕpalle) and XIV (Dánapa)	*l* 59·88 *h* 61·12 *d* 59·30	*h* 62·60 *h* 62·20 *d* 60·31 *d* 61·63	*h* 62·50 *h* 63·44	*h* 62·80 *h* 63·32	*h* 60·54 *h* 60·72	*h* 61·02 *h* 62·26	*h* 63·34 *h* 63·10	*h* 63·76 *l* 60·44 *l* 61·08	*l* 61·54 *l* 60·36 *d* 60·87	*l* 60·98 *l* 61·54 *l* 61·02	$M = 61''\cdot72$ $w = 7\cdot30$ $\frac{1}{w} = 0\cdot14$
	60·10	61·69	62·97	63·06	60·63	61·64	63·22	61·76	60·92	61·18	$C = 48° 14' 1''\cdot70$
XIV (Dánapa) and XI (Yĕrrakŏnda)	*l* 59·16 *h* 57·36 *d* 57·06	*h* 56·80 *h* 57·66 *d* 55·14 *d* 56·46	*h* 58·68 *h* 57·58	*h* 58·86 *h* 57·40	*h* 57·20 *h* 56·70	*h* 57·06 *h* 57·40	*h* 57·64 *h* 56·34	*h* 57·22 *l* 56·34	*l* 57·94 *l* 58·58 *l* 57·22 *d* 57·83	*l* 55·84 *l* 56·80	$M = 57''\cdot28$ $w = 15\cdot77$ $\frac{1}{w} = 0\cdot06$
	57·86	56·52	58·13	58·13	56·95	57·23	56·99	56·78	57·89	56·32	$C = 55° 43' 57''\cdot28$
XI (Yĕrrakŏnda) and VIII (Mániam)	*l* 3·60 *l* 3·86	*l* 5·84 *l* 3·22 *l* 5·52	*h* 2·86 *h* 3·72	*l* 3·78 *l* 3·12	*l* 5·60 *l* 3·50 *l* 4·56	*l* 4·90 *l* 3·12	*h* 2·96 *h* 6·06 *h* 3·38 *h* 5·62	*h* 1·62 *l* 5·06 *l* 4·94 *l* 2·38 *l* 2·24	*l* 4·54 *l* 4·98 *l* 4·00	*l* 2·50 *l* 3·96	$M = 3''\cdot94$ $w = 12\cdot84$ $\frac{1}{w} = 0\cdot08$
	3·73	4·86	3·29	3·45	4·55	4·01	4·51	3·25	4·51	3·23	$C = 65° 19' 3''\cdot97$
VIII (Mániam) and VII (Dhúlipalla)	*l* 34·32 *l* 34·56	*l* 33·04 *l* 33·50	*h* 33·00 *h* 34·00	*l* 33·74 *l* 32·64	*l* 33·56 *l* 35·30	*l* 33·06 *l* 33·98	*h* 34·72 *h* 33·04	*h* 36·18 *l* 31·32 *l* 32·32 *l* 35·50 *l* 35·86	*l* 33·00 *l* 30·72 *l* 33·06	*l* 34·14 *l* 35·30	$M = 33''\cdot75$ $w = 8\cdot97$ $\frac{1}{w} = 0\cdot11$
	34·44	33·27	33·50	33·19	34·43	33·52	33·88	34·24	32·26	34·72	$C = 44° 37' 33''\cdot74$

At X (Ádamsáb)

December 1863; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XII (Pálapáru) 129° 44′	309° 44′	208° 56′	28° 57′	288° 8′	108° 9′	7° 20′	187° 21′	86° 32′	266° 33′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XII (Pálapáru) and IX (Kotapa)	″ h 28·88 h 33·76 h 33·80 h 34·62 h 30·76 h 33·26	″ h 31·98 h 30·56	″ l 33·98 l 31·54 l 31·42	″ l 34·12 l 32·82	″ l 34·62 l 34·00	″ h 33·24 h 32·42	″ l 33·60 l 35·54 l 35·98	″ l 33·56 l 34·68	″ l 33·08 l 33·16	″ l 31·96 l 34·50 l 34·84	$M = 33''\cdot 28$ $w = 5\cdot 45$ $\frac{1}{w} = 0\cdot 18$ $C = 63° 46' 33''\cdot 27$
	32·51	31·27	32·31	33·47	34·31	32·83	35·04	34·12	33·12	33·77	
IX (Kotapa) and VII (Dhúlipalla)	h 63·28 h 59·48 h 60·52 h 60·38	h 61·84 h 63·56	l 58·96 l 60·16	l 58·86 l 57·96	l 62·36 h 61·86	h 61·18 h 62·08	l 59·86 l 56·54 l 59·58	l 63·72 l 59·86 l 60·78	l 60·42 l 59·28	l 62·50 l 58·80 l 60·92	$M = 60''\cdot 60$ $w = 3\cdot 74$ $\frac{1}{w} = 0\cdot 27$ $C = 65° 57' 0''\cdot 60$
	60·92	62·70	59·56	58·41	62·11	61·63	58·66	61·45	59·85	60·74	

At XI (Yĕrrakŏnda)

March 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VIII (Mániam) 94° 31′	274° 31′	173° 43′	353° 43′	252° 54′	72° 54′	332° 7′	152° 7′	51° 18′	231° 18′	M = Mean of Groups w = Relative Weight C = Concluded Angle
VIII (Mániam) and IX (Kotapa)	″ l 31·90 l 31·34	″ l 31·36 l 31·44	″ l 30·26 l 30·44	″ l 30·58 l 30·68	″ l 30·78 l 30·28	″ l 31·10 l 30·52	″ l 32·60 l 31·86	″ h 29·76 h 29·28	″ h 32·34 h 30·78	″ h 28·94 h 28·72	$M = 30''\cdot 75$ $w = 9\cdot 05$ $\frac{1}{w} = 0\cdot 11$ $C = 48° 26' 30''\cdot 75$
	31·62	31·40	30·35	30·63	30·53	30·81	32·23	29·52	31·56	28·83	
IX (Kotapa) and XIV (Dánapa)	h 24·52 h 27·52 h 25·60	l 23·94 l 24·28	l 24·36 l 24·34	l 24·48 l 23·70	l 24·60 l 23·70	l 24·74 l 25·98	l 25·22 l 24·56	h 25·30 h 25·58	h 23·04 h 24·80	h 25·54 h 25·80	$M = 24''\cdot 79$ $w = 13\cdot 33$ $\frac{1}{w} = 0\cdot 08$ $C = 46° 3' 24''\cdot 80$
	25·88	24·11	24·35	24·09	24·15	25·36	24·89	25·44	23·92	25·67	

At XII (Pálapáru)

January 1864; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIII (Babbĕpalle) 130° 42′	310° 43′	209° 54′	29° 55′	289° 6′	109° 7′	8° 18′	188° 19′	87° 30′	267° 31′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XIII (Babbĕpalle) and IX (Kotapa)	l 57·02 l 53·30 l 55·14 l 53·74	l 54·12 l 53·80	l 55·96 l 51·58 l 50·30 l 51·62 l 52·32 l 52·26 l 54·76	l 51·54 l 53·00	l 54·26 l 54·72	l 55·88 l 53·72 l 53·04	l 53·16 l 53·70	l 54·22 l 54·60	l 54·74 l 54·50	l 54·58 l 53·48 l 53·88	$M = 53''\cdot89$ $w = 8\cdot04$ $\frac{1}{w} = 0\cdot12$ $C = 60°\ 19'\ 53''\cdot87$
	54·80	53·96	52·69	52·27	54·49	54·21	53·43	54·41	54·62	53·98	
IX (Kotapa) and X (Ádamsáb)	l 35·36 l 37·34 l 36·46	l 37·60 l 36·36	l 38·00 l 39·90 l 39·00	l 38·86 l 35·84 l 38·54 l 36·86	l 37·66 l 36·82	l 36·50 l 37·40	l 38·20 l 36·44	l 37·00 l 37·66	l 36·26 l 36·94	l 37·72 l 38·00	$M = 37''\cdot32$ $w = 12\cdot92$ $\frac{1}{w} = 0\cdot08$ $C = 70°\ 21'\ 37''\cdot33$
	36·39	36·98	38·97	37·53	37·24	36·95	37·32	37·33	36·60	37·86	

At XIII (Babbĕpalle)

December 1863; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XVI (Faranguldinne) 249° 9′	69° 10′	328° 21′	148° 22′	47° 33′	227° 33′	126° 45′	306° 46′	205° 57′	25° 58′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XVI (Faranguldinne) and XV (Medaramĕtla)	l 61·84 l 61·36	l 61·92 l 62·04	l 61·54 l 61·56	l 60·96 l 60·60	l 63·14 l 62·12	l 62·36 l 61·38	l 62·58 l 60·94	l 59·52 l 63·02 l 62·04	l 61·30 l 60·84	l 62·02 l 60·36	$M = 61''\cdot60$ $w = 19\cdot03$ $\frac{1}{w} = 0\cdot05$ $C = 45°\ 33'\ 1''\cdot60$
	61·60	61·98	61·55	60·78	62·63	61·87	61·76	61·53	61·07	61·19	
XV (Medaramĕtla) and XIV (Dánapa)	l 39·38 l 38·84	l 38·22 l 38·44	l 39·96 l 40·14 d 40·78	l 39·52 l 39·62 d 41·55	l 38·28 l 39·08	l 38·16 l 37·64	l 39·46 l 40·26	l 41·90 l 40·24	l 38·02 l 38·74	l 38·26 l 39·44 l 38·54	$M = 39''\cdot26$ $w = 8\cdot25$ $\frac{1}{w} = 0\cdot12$ $C = 56°\ 42'\ 39''\cdot27$
	39·11	38·33	40·29	40·23	38·68	37·90	39·86	41·07	38·38	38·75	

At XIII (Babbĕpalle)—(*Continued*).

Angle between	Circle readings, telescope being set on XVI (Faranguldinne) 249° 9′	69° 10′	328° 21′	148° 22′	47° 33′	227° 33′	126° 45′	306° 46′	205° 57′	25° 58′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XIV (Dánapa) and IX (Kotapa)	″	″	″	″	″	″	″	″	″	″	
	l 56·28	l 55·58	l 56·60	l 55·38	l 55·72	l 55·66	l 55·26	l 55·16	l 56·84	l 56·16	$M = 55''·53$
	l 54·64	l 55·14	l 54·26	l 54·96	l 53·26	l 56·02	l 55·26	l 54·78	l 55·48	l 56·16	$w = 21·70$
			h 54·20	d 57·15	l 56·12						$\frac{1}{w} = 0·05$
			d 55·75								
	55·46	55·36	55·20	55·83	55·03	55·84	55·26	54·97	56·16	56·16	$C = 70° 32' 55''·51$
IX (Kotapa) and XII (Pálapáru)	l 50·30	l 52·16	l 52·26	l 49·26	l 51·88	l 50·54	l 50·72	l 51·80	l 49·18	l 51·58	$M = 51''·23$
	l 51·46	l 51·98	l 51·06	l 52·02	l 53·00	l 51·22	l 51·40	l 50·84	l 50·94	l 50·82	$w = 14·66$
				l 51·02							$\frac{1}{w} = 0·07$
	50·88	52·07	51·66	50·77	52·44	50·88	51·06	51·32	50·06	51·20	$C = 76° 19' 51''·23$

At XIV (Dánapa)

* *March* 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.
† *December* 1863; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XI (Yĕrrakŏnda) 139° 27′	319° 27′	218° 38′	38° 38′	297° 51′	117° 51′	17° 3′	197° 3′	96° 15′	276° 15′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
* XI (Yĕrrakŏnda) and IX (Kotapa)	″	″	″	″	″	″	″	″	″	″	
	h 44·00	l 40·66	l 42·20	l 41·32	l 43·20	l 42·16	h 40·58	h 40·06	l 41·76	l 41·38	$M = 41''·48$
	h 42·78	l 39·64	l 41·84	l 39·00	l 41·34	l 41·62	h 41·70	l 40·48	l 41·06	l 41·30	$w = 8·47$
				l 42·46							$\frac{1}{w} = 0·12$
	43·39	40·15	42·02	40·93	42·27	41·89	41·14	40·27	41·41	41·34	$C = 78° 12' 41''·48$
* IX (Kotapa) and XIII (Babbĕpalle)	h 2·56	l 4·22	l 2·76	l 3·26	l 5·06	l 2·66	h 3·20	h 4·26	l 2·32	l 5·62	$M = 3''·82$
	l 3·92	l 4·38	l 2·18	l 4·52	l 4·94	l 3·70	h 2·32	l 5·52	l 3·48	l 5·46	$w = 7·95$
											$\frac{1}{w} = 0·13$
	3·24	4·30	2·47	3·89	5·00	3·18	2·76	4·89	2·90	5·54	$C = 61° 13' 3''·82$

Angle between	Circle readings, telescope being set on Referring Mark 0° 0′	180° 1′	79° 12′	259° 13′	158° 24′	338° 25′	237° 36′	57° 37′	316° 48′	136° 49′	
† Referring Mark and XIII (Babbĕpalle)	″	″	″	″	″	″	″	″	″	″	
	l 11·78	l 11·20	l 11·12	l 13·60	l 9·64	l 11·72	l 11·86	l 12·68	l 13·38	l 11·10	$M = 11''·94$
	l 12·34	l 9·98	l 10·90	l 12·66	l 12·18	l 12·98	l 13·36	l 12·20	l 11·96	l 12·26	$w = 10·48$
					l 10·74						$\frac{1}{w} = 0·10$
	12·06	10·59	11·01	13·13	10·85	12·35	12·61	12·44	12·67	11·68	$C = 56° 48' 11''·93$

At XIV (Dánapa)—(*Continued*).

Angle between	Circle readings, telescope being set on Referring Mark 0°0′	180°1′	79°12′	259°13′	158°24′	338°25′	237°36′	57°37′	316°48′	136°49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XIII (Babbĕpalle) and XV (Medaramĕtla)	″ l 40·06 l 39·06	″ l 40·72 l 41·40	″ l 41·26 l 40·56	″ l 39·14 l 38·76	″ l 40·82 l 38·82 l 40·72	″ l 41·46 l 40·98	″ l 39·86 l 38·98	″ l 39·72 l 38·82	″ l 39·92 l 40·12	″ l 40·80 l 38·50 l 39·24	$M = 40''\cdot00$ $w = 12\cdot28$ $\frac{1}{w} = 0\cdot08$
	39·56	41·06	40·91	38·95	40·12	41·22	39·42	39·27	40·02	39·51	$C = 75°\ 8'\ 40''\cdot00$
† XV (Medaramĕtla) and XVII (Pĕddakaltippa)	l 56·52 l 57·90	l 56·42 l 57·28	l 56·36 l 58·52 l 58·06	l 57·46 l 57·34	l 56·58 l 57·78	l 54·90 l 54·76	l 57·12 l 56·92	h 56·94 h 57·36	l 55·72 l 56·04	l 55·56 l 57·30	$M = 56''\cdot76$ $w = 11\cdot57$ $\frac{1}{w} = 0\cdot09$
	57·21	56·85	57·65	57·40	57·18	54·83	57·02	57·15	55·88	56·43	$C = 82°\ 0'\ 56''\cdot77$

At XV (Medaramĕtla)

January 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIX (Chemakurti) 0°1′	180°1′	79°13′	259°13′	158°25′	338°25′	237°36′	57°37′	316°49′	136°49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XIX (Chemakurti) and XVII (Pĕddakaltippa)	″ l 21·80 l 20·56	″ l 24·20 l 24·64 l 22·58	″ l 23·48 l 23·34	″ l 26·30 l 24·00 l 24·56 d 24·48	″ l 21·74 l 20·78	″ l 21·28 l 21·60	″ l 22·18 l 21·46	″ l 22·54 l 22·80	″ l 24·44 l 23·04 d 24·04 d 23·64	″ l 22·66 l 22·58	$M = 22''\cdot68$ $w = 5\cdot78$ $\frac{1}{w} = 0\cdot17$
	21·18	23·81	23·41	24·84	21·26	21·44	21·82	22·67	23·79	22·62	$C = 51°\ 58'\ 22''\cdot70$
XVII (Pĕddakaltippa) and XIV (Dánapa)	l 20·46 l 21·74	l 20·78 l 18·66 l 20 46	l 19·02 l 18·66	l 17·98 l 19·58 d 18·31	l 20·08 l 21·74	l 21·44 l 20·54	l 20·70 l 22·32	l 19·10 l 19·80	l 19·94 l 22·24 l 20·22 d 21·10 d 20·70	l 20·16 l 21·30	$M = 20''\cdot30$ $w = 8\cdot06$ $\frac{1}{w} = 0\cdot12$
	21·10	19·97	18·84	18·62	20·91	20·99	21·51	19·45	20·84	20·73	$C = 51°\ 32'\ 20''\cdot30$
XIV (Dánapa) and XIII (Babbĕpalle)	l 43·36 l 43·00	l 41·88 l 41·96	l 42·60 l 43·12	l 41·52 l 42·32	l 42·34 l 41·38	l 42·44 l 42·52	l 42·24 l 41·60	l 43·04 l 42·62	l 41·22 l 41·96	l 42·10 l 41·42	$M = 42''\cdot23$ $w = 28\cdot20$ $\frac{1}{w} = 0\cdot04$
	43·18	41·92	42·86	41·92	41·86	42·48	41·92	42·83	41·59	41·76	$C = 48°\ 8'\ 42''\cdot23$

At XV (Medaramĕtla)—(*Continued*).

Angle between	Circle readings, telescope being set on XIX (Chemakurti) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 36′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XIII (Babbĕpalle) and XVI (Faranguldinne)	″ l 23·26 l 22·48	″ l 23·40 l 23·86	″ l 22·74 l 22·14	″ l 24·06 l 24·02	″ l 24·00 l 24·04	″ l 23·00 l 23·26	″ l 24·10 l 23·94	″ l 24·54 l 23·16	″ l 24·24 l 22·76	″ l 22·80 l 23·94	$M = 23''\cdot49$ $w = 26\cdot30$ $\frac{1}{w} = 0\cdot04$
	22·87	23·63	22·44	24·04	24·02	23·13	24·02	23·85	23·50	23·37	$C = 74^\circ\ 52'\ 23''\cdot49$
XVI (Faranguldinne) and XVIII (Ongole)	l 25·82 l 25·66	l 24·68 l 24·74	l 26·12 l 25·56	l 23·74 l 23·64	l 25·42 l 25·28	l 24·84 l 25·00	l 24·16 l 23·30	l 23·92 l 24·70	l 23·92 l 25·54	l 25·90 l 24·52	$M = 24''\cdot82$ $w = 15\cdot50$ $\frac{1}{w} = 0\cdot06$
	25·74	24·71	25·84	23·69	25·35	24·92	23·73	24·31	24·73	25·21	$C = 68^\circ\ 5'\ 24''\cdot82$
XVIII (Ongole) and XIX (Chemakurti)	l 46·60 l 45·60	l 46·26 l 46·08	l 46·38 l 45·74	l 47·30 l 45·90	l 46·58 l 45·24	l 45·78 l 46·80	l 45·80 l 47·34	l 46·88 l 46·96	l 46·14 l 45·22	l 45·06 l 43·26	$M = 46''\cdot05$ $w = 13\cdot60$ $\frac{1}{w} = 0\cdot07$
	46·10	46·17	46·06	46·60	45·91	46·29	46·57	46·92	45·68	44·16	$C = 65^\circ\ 22'\ 46''\cdot05$

At XVI (Faranguldinne)

January 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XVIII (Ongole) 121° 25′	301° 26′	200° 37′	20° 37′	279° 49′	99° 50′	359° 1′	179° 2′	78° 13′	258° 14′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVIII (Ongole) and XV (Medaramĕtla)	″ l 55·12 l 52·46 l 53·40	″ l 51·12 l 51·86	″ l 49·92 l 51·26	″ l 53·10 l 52·36	″ l 52·66 l 51·32	″ l 50·60 l 53·96 l 52·26 l 53·30	″ l 51·82 l 50·98	″ l 50·72 l 53·54 l 52·44	″ l 53·18 l 54·46 l 51·10 l 52·72	″ l 52·16 l 51·40 l 53·16 l 53·04	$M = 52''\cdot19$ $w = 9\cdot03$ $\frac{1}{w} = 0\cdot11$
	53·66	51·49	50·59	52·73	51·99	52·53	51·40	52·23	52·87	52·44	$C = 61^\circ\ 49'\ 52''\cdot24$
XV (Medaramĕtla) and XIII (Babbĕpalle)	l 34·38 l 36·50 l 35·44	l 35·58 l 36·90	l 37·38 l 34·60 l 36·22	l 34·54 l 36·50	l 35·14 l 37·18 l 37·60	l 36·32 l 35·80	l 36·30 l 36·38	l 37·84 l 35·68 l 36·34	l 35·10 l 33·78 l 36·42 l 34·62	l 36·16 l 36·04 l 36·66	$M = 36''\cdot02$ $w = 17\cdot70$ $\frac{1}{w} = 0\cdot06$
	35·44	36·24	36·07	35·52	36·64	36·06	36·34	36·62	34·98	36·29	$C = 59^\circ\ 34'\ 36''\cdot00$

At XVII (Pĕddakaltippe)

January 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIV (Dánapa) 91° 20′	271° 21′	170° 32′	350° 32′	249° 44′	69° 44′	328° 56′	148° 56′	48° 8′	228° 9′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XIV (Dánapa) and XV (Medaramĕtla)	"	"	"	"	"	"	"	"	"	"	
	l 46·34	l 45·84	l 46·42	l 45·26	l 46·50	l 45·58	l 45·48	l 46·22	l 46·62	l 44·14	$M = 45''\cdot66$
	l 45·52	l 45·56	l 45·80	l 45·10	l 46·24	l 45·60	l 45·58	l 44·46	l 46·08	l 44·88	$w = 25\cdot60$; $\frac{1}{w} = 0\cdot04$
	45·93	45·70	46·11	45·18	46·37	45·59	45·53	45·34	46·35	44·51	$C = 46° 26' 45''\cdot66$
XV (Medaramĕtla) and XIX (Chemakurti)	l 44·62	l 48·56	l 49·42	l 48·76	l 48·86	l 47·00	l 49·54	l 48·26	l 47·64	l 49·00	$M = 47''\cdot98$
	l 47·44	l 47·40	l 48·10	l 47·62	l 47·32	l 47·06	l 46·88	l 47·00	l 47·60	l 48·74	$w = 13\cdot50$
	l 48·32						l 48·94				$\frac{1}{w} = 0\cdot07$
	l 48·42										
	47·20	47·98	48·76	48·19	48·09	47·03	48·45	47·63	47·62	48·87	$C = 44° 52' 47''\cdot96$

At XVIII (Ongole)

January 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXI (Puripád) 208° 44′	28° 45′	287° 56′	107° 57′	7° 8′	187° 9′	86° 20′	266° 21′	165° 32′	345° 33′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXI (Puripád) and XX (Netivaripálĕm)	"	"	"	"	"	"	"	"	"	"	
	l 38·22	l 35·72	l 37·84	l 37·34	l 36·52	l 39·06	l 36·78	l 37·36	l 37·20	l 36·80	$M = 37''\cdot32$
	l 37·12	l 36·96	l 38·16	l 37·26	l 37·76	l 38·12	l 36·36	l 35·32	l 37·88	l 35·50	$w = 12\cdot32$
	d 37·57	d 37·58	d 38·99	d 39·16				l 37·74			$\frac{1}{w} = 0\cdot08$
	d 36·73	d 36·44	d 38·77	d 37·84							
	37·41	36·68	38·44	37·90	37·14	38·59	36·57	36·81	37·54	36·15	$C = 48° 8' 37''\cdot33$
XX (Netivaripálĕm) and XIX (Chemakurti)	l 44·02	l 47·26	l 44·78	l 43·92	l 45·58	l 42·22	l 42·42	l 44·88	l 45·66	l 45·16	$M = 44''\cdot96$
	l 46·20	l 45·26	l 44·88	l 44·64	l 46·16	l 44·12	l 43·64	l 45·26	l 44·82	l 46·04	$w = 7\cdot04$
	d 45·01	d 47·50	d 45·82	d 46·14							$\frac{1}{w} = 0\cdot14$
	d 44·17	d 46·36	d 45·60	d 44·82							
	44·85	46·60	45·27	44·88	45·87	43·17	43·03	45·07	45·24	45·60	$C = 58° 44' 44''\cdot98$

At XVIII (Ongole)—(*Continued*).

Angle between	Circle readings, telescope being set on XXI (Puripád) 208° 44′	28° 45′	287° 56′	107° 57′	7° 8′	187° 9′	86° 20′	266° 21′	165° 32′	345° 33′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XIX (Chemakurti) and XV (Medaramĕtla)	″ *l* 34·56 *l* 34·16	″ *l* 32·84 *l* 33·72	″ *l* 35·06 *l* 33·32	″ *l* 32·58 *l* 32·26	″ *l* 35·48 *l* 34·24	″ *l* 35·18 *l* 33·38	″ *l* 35·42 *l* 34·38	″ *l* 32·38 *l* 33·94	″ *l* 33·18 *l* 35·52 *l* 34·38	″ *l* 35·78 *l* 34·74	$M = 34''·11$ $w = 9·82$ $\frac{1}{w} = 0·10$
	34·36	33·28	34·19	32·42	34·86	34·28	34·90	33·16	34·36	35·26	$C = 51° 45' 34''·11$
XV (Medaramĕtla) and XVI (Faranguldinne)	*l* 44·42 *l* 44·68	*l* 44·76 *l* 44·76	*l* 44·10 *l* 43·84	*l* 46·00 *l* 44·74	*l* 43·20 *l* 43·64	*l* 45·96 *l* 45·04	*l* 43·98 *l* 43·70	*l* 45·04 *l* 44·48	*l* 44·06 *l* 43·24	*l* 42·44 *l* 43·52	$M = 44''·28$ $w = 13·10$ $\frac{1}{w} = 0·08$
	44·55	44·76	43·97	45·37	43·42	45·50	43·84	44·76	43·65	42·98	$C = 50° 4' 44''·28$

At XIX (Chemakurti)

January 1864; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XVII (Pĕddakaltippa) 272° 28′	92° 28′	351° 40′	171° 40′	70° 52′	250° 53′	150° 4′	330° 4′	229° 16′	49° 16′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XVII (Pĕddakaltippa) and XV (Medaramĕtla)	″ *l* 49·04 *l* 49·28	″ *l* 49·30 *l* 48·16	″ *l* 48·14 *l* 47·92	″ *l* 47·60 *l* 46·54	″ *l* 51·22 *l* 49·88	″ *l* 49·66 *l* 50·80	″ *l* 50·20 *l* 48·66	″ *l* 51·32 *l* 50·20	″ *l* 49·38 *l* 50·74	″ *l* 47·54 *l* 48·54	$M = 49''·21$ $w = 6·00$ $\frac{1}{w} = 0·17$
	49·16	48·73	48·03	47·07	50·55	50·23	49·43	50·76	50·06	48·04	$C = 83° 8' 49''·21$
XV (Medaramĕtla) and XVIII (Ongole)	*l* 43·94 *l* 43·18	*l* 41·86 *l* 42·30	*l* 45·10 *l* 43·94	*l* 44·82 *l* 40·66 *l* 41·38 *l* 42·38 *h* 40·72 *h* 41·16	*l* 43·98 *l* 44·42	*l* 43·04 *l* 43·60	*l* 42·66 *l* 41·52	*l* 42·56 *l* 42·14	*l* 44·08 *l* 42·28	*l* 43·68 *l* 42·44	$M = 43''·02$ $w = 8·41$ $\frac{1}{w} = 0·12$
	43·56	42·08	44·52	41·85	44·20	43·32	42·09	[42·35	43·18	43·06	$C = 62° 51' 42''·99$
XVIII (Ongole) and XX (Netivaripálĕm)	*l* 5·80 *l* 3·12 *l* 4·18	*l* 3·10 *l* 2·54	*l* 3·16 *l* 5·32 *l* 4·84	*l* 3·50 *l* 6·60 *l* 3·54 *l* 2·22	*l* 3·40 *l* 3·92	*l* 4·66 *l* 4·06	*l* 4·24 *l* 4·88	*l* 3·96 *l* 3·56	*l* 2·96 *l* 3·92	*l* 4·28 *l* 2·10 *l* 4·74	$M = 3''·91$ $w = 15·03$ $\frac{1}{w} = 0·07$
	4·37	2·82	4·44	3·97	3·66	4·36	4·56	3·76	3·44	3·71	$C = 63° 30' 3''·93$

At XIX (Chemakurti)—(*Continued*).

Angle between	Circle readings, telescope being set on XVII (Pĕddakaltippa) 272° 28′	92° 28′	351° 40′	171° 40′	70° 52′	250° 53′	150° 4′	330° 4′	229° 16′	49° 16′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XX (Netivaripálĕm) and XXII (Nishánkŏnda)	″ *l* 29·70 *l* 30·28	″ *l* 27·20 *l* 27·08	″ *l* 27·72 *l* 28·78	″ *l* 29·26 *l* 28·16	″ *l* 29·04 *l* 28·02	″ *l* 29·28 *l* 27·48	″ *l* 31·52 *l* 27·74 *l* 29·22 *l* 28·28	″ *l* 29·18 *l* 28·52	″ *l* 28·82 *l* 26·66 *l* 29·96 *l* 28·26	″ *l* 28·40 *l* 28·20	$M = 28''·58$ $w = 11·54$ $\frac{1}{w} = 0·09$
	29·99	27·14	28·25	28·71	28·53	28·38	29·19	28·85	28·43	28·30	$C = 62° 56' 28''·59$

At XX (Netivaripálĕm)

February 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIX (Chemakurti) 0° 1′	180° 1′	79° 12′	259° 13′	158° 24′	338° 25′	237° 36′	57° 37′	316° 48′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XIX (Chemakurti) and XVIII (Ongole)	″ *l* 12·88 *l* 13·12	″ *l* 12·52 *l* 13·42	″ *l* 14·18 *l* 12·12 *l* 13·20	″ *l* 13·12 *l* 14·46	″ *l* 12·86 *l* 12·14	″ *l* 13·26 *l* 14·28	″ *l* 13·56 *l* 11·84	″ *l* 11·98 *l* 13·36	″ *l* 12·82 *l* 13·38	″ *l* 12·38 *l* 12·18	$M = 13''·00$ $w = 24·20$ $\frac{1}{w} = 0·04$
	13·00	12·97	13·17	13·79	12·50	13·77	12·70	12·67	13·10	12·28	$C = 57° 45' 13''·00$
XVIII (Ongole) and XXI (Puripád)	*l* 47·72 *l* 49·00	*l* 49·22 *l* 48·06	*l* 47·98 *l* 48·22	*l* 49·68 *l* 47·62 *l* 49·68	*l* 48·08 *l* 46·98	*l* 49·66 *l* 47·24 *l* 47·56	*l* 47·62 *l* 47·02	*l* 50·84 *l* 46·76 *l* 46·72 *l* 47·08 *l* 47·30	*l* 49·02 *l* 48·72	*l* 48·34 *l* 47·60	$M = 48''·17$ $w = 14·69$ $\frac{1}{w} = 0·07$
	48·36	48·64	48·10	48·99	47·53	48·15	47·32	47·74	48·87	47·97	$C = 69° 18' 48''·17$
XXI (Puripád) and XXIV (Kuchĕrla)	*l* 34·42 *l* 30·00 *l* 31·76 *l* 30·08 *l* 32·60	*h* 32·20 *h* 35·30 *d* 33·45 *d* 34·09	*l* 35·66 *l* 36·68	*l* 35·02 *l* 34·50	*l* 35·08 *l* 33·04 *l* 35·00	*l* 34·66 *l* 34·22	*l* 35·64 *l* 36·12	*l* 34·30 *l* 36·46 *l* 36·08	*l* 34·66 *l* 34·84	*l* 34·54 *l* 35·58	$M = 34''·66$ $w = 5·11$ $\frac{1}{w} = 0·20$
	31·77	33·76	36·17	34·76	34·37	34·44	35·88	35·61	34·75	35·06	$C = 71° 33' 34''·62$
XXIV (Kuchĕrla) and XXIII (Pichĕrla)	*l* 13·72 *l* 15·06	*h* 9·58 *h* 11·76 *d* 10·37 *d* 11·01	*l* 10·78 *l* 12·04	*l* 12·32 *l* 11·54	*l* 10·54 *l* 13·62 *l* 12·16 *l* 11·44	*h* 10·96 *h* 13·22 *h* 10·42 *d* 11·81 *d* 12·43	*l* 12·04 *l* 10·98 *d* 13·33 *d* 11·27	*l* 11·62 *l* 11·34 *d* 11·00 *d* 9·86	*l* 11·90 *l* 9·96	*l* 11·42 *l* 11·62	$M = 11''·74$ $w = 7·43$ $\frac{1}{w} = 0·13$
	14·39	10·68	11·41	11·93	11·94	11·77	11·91	10·95	10·93	11·52	$C = 35° 28' 11''·72$

At XX (Netivaripálĕm)—(*Continued*).

Angle between	0° 1′	180° 1′	79° 12′	259° 13′	158° 24′	338° 25′	237° 36′	57° 37′	316° 48′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XIX (Chemakurti)										
XXIII (Pichĕrla) and XXII (Nishánkŏnda)	″ l 46·42 l 46·36	″ l 48·14 l 46·02 l 44·00 l 45·66 l 45·90	″ l 46·50 l 45·08	″ l 45·26 l 45·60	″ l 47·62 l 45·66	″ h 46·58 h 44·44 d 45·79 d 46·41	″ l 45·88 l 46·54 d 48·03 d 45·97	″ l 45·68 l 46·24 d 45·48 d 44·34	″ l 47·58 l 47·14	″ l 46·50 l 46·02	$M = 46''\cdot 17$ $w = 16\cdot 05$ $\frac{1}{w} = 0\cdot 06$
	46·39	45·94	45·79	45·43	46·64	45·81	46·60	45·44	47·36	46·26	$C = 63° 47' 46''\cdot 15$
XXII (Nishánkŏnda) and XIX (Chemakurti)	l 25·34 l 25·42	l 26·72 l 27·16	l 25·20 l 25·30	l 25·96 l 25·38	l 27·80 l 28·36	l 26·76 l 26·24	l 26·36 l 25·84	l 27·42 l 26·28	l 24·64 l 26·34	l 27·12 l 26·56	$M = 26''\cdot 31$ $w = 11\cdot 45$ $\frac{1}{w} = 0\cdot 09$
	25·38	26·94	25·25	25·67	28·08	26·50	26·10	26·85	25·49	26·84	$C = 62° 6' 26''\cdot 31$

At XXI (Puripád)

March 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	179° 55′	359° 56′	259° 7′	79° 8′	338° 19′	158° 20′	57° 31′	237° 32′	136° 43′	316° 44′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XXV (Darutippa)										
XXV (Darutippa) and XXIV (Kuchĕrla)	″ l 42·16 l 41·82	″ l 40·38 l 40·90	″ l 41·70 l 40·78	″ l 40·82 l 40·04	″ l 39·76 l 41·40	″ l 41·46 l 40·20	″ l 39·96 l 39·98	″ l 41·50 l 39·74	″ l 42·28 l 41·12	″ l 41·30 l 40·96	$M = 40''\cdot 91$ $w = 19\cdot 60$ $\frac{1}{w} = 0\cdot 05$
	41·99	40·64	41·24	40·43	40·58	40·83	39·97	40·62	41·70	41·13	$C = 48° 46' 40''\cdot 91$
XXIV (Kuchĕrla) and XX (Netivaripálĕm)	l 24·52 l 23·16	l 24·90 l 24·96	l 22·64 l 23·50	l 23·48 l 23·34	l 24·92 l 22·76 l 23·02	l 22·92 l 22·84	l 23·48 l 23·56	l 24·20 l 25·50	l 23·18 l 23·84	l 23·42 l 24·06	$M = 23''\cdot 73$ $w = 17\cdot 18$ $\frac{1}{w} = 0\cdot 06$
	23·84	24·93	23·07	23·41	23·57	22·88	23·52	24·85	23·51	23·74	$C = 68° 35' 23''\cdot 73$
XX (Netivaripálĕm) and XVIII (Ongole)	l 34·24 l 35·10	l 35·06 l 34·48	l 37·66 l 37·08	l 35·22 l 36·34	l 36·08 l 36·78	l 36·94 l 35·98	l 36·30 l 34·78	l 35·22 l 34·98	l 35·36 l 35·50	l 37·10 l 36·58	$M = 35''\cdot 84$ $w = 11\cdot 05$ $\frac{1}{w} = 0\cdot 09$
	34·67	34·77	37·37	35·78	36·43	36·46	35·54	35·10	35·43	36·84	$C = 62° 32' 35''\cdot 84$

At XXII (Nishánkŏnda)

January 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIX (Chemakurti) 123° 54′	303° 55′	203° 6′	23° 7′	282° 18′	102° 19′	1° 31′	181° 31′	80° 43′	260° 43′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XIX (Chemakurti) and XX (Netivaripálĕm)	″ l 7·62 l 4·86 l 6·18	″ l 8·14 l 5·20 l 8·56 l 4·64	″ l 5·32 l 5·18	″ l 4·54 l 7·02 l 2·16 l 3·72 l 3·76	″ h 10·18 h 6·74 h 7·66 h 4·56 h 7·00 h 6·36 h 5·18	″ l 7·16 l 7·60	″ l 7·42 l 10·22 l 7·68 l 6·90 l 4·80 l 5·78	″ l 6·62 l 6·54	″ l 4·18 l 6·14	″ l 8·20 l 7·48 l 5·38	$M = 6''\cdot24$ $w = 5\cdot85$ $\frac{1}{w} = 0\cdot17$ $C = 54^\circ\ 57'\ 6''\cdot26$
	6·22	6·64	5·25	4·24	6·81	7·38	7·13	6·58	5·16	7·02	
XX (Netivaripálĕm) and XXIII (Pichĕrla)	l 50·62 l 51·34	l 49·96 l 52·04 l 51·66	l 50·62 l 53·66 l 52·50	l 52·18 l 51·44	h 47·74 h 49·92 h 50·12 l 51·94 l 49·98 l 51·54 l 49·54	l 49·20 l 49·14	l 48·20 l 45·10 l 48·90 l 50·38 l 52·52 l 49·94	l 51·16 l 52·00	l 50·92 l 50·24	l 50·20 l 49·92	$M = 50''\cdot69$ $w = 5\cdot63$ $\frac{1}{w} = 0\cdot18$ $C = 68^\circ\ 56'\ 50''\cdot65$
	50·98	51·22	52·26	51·81	50·11	49·17	49·17	51·58	50·58	50·06	

At XXIII (Pichĕrla)

February 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXII (Nishánkŏnda) 170° 1′	350° 2′	249° 13′	69° 18′	328° 24′	148° 25′	47° 36′	227° 37′	126° 49′	306° 49′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXII (Nishánkŏnda) and XX (Netivaripálĕm)	″ l 28·76 l 29·44	″ l 28·20 l 28·16	″ l 30·66 l 27·26 l 28·26	″ l 26·56 l 26·80	″ l 27·50 l 27·36	″ l 27·70 l 27·18	″ l 29·10 l 27·12	″ l 28·42 l 27·58	″ l 28·16 l 27·42	″ l 27·90 l 27·38	$M = 27''\cdot91$ $w = 14\cdot48$ $\frac{1}{w} = 0\cdot07$
	29·10	28·18	28·73	26·68	27·43	27·44	28·11	28·00	27·79	27·64	$C = 47^\circ\ 15'\ 27''\cdot92$
XX (Netivaripálĕm) and XXIV (Kuchĕrla)	l 65·96 l 64·42	l 62·72 l 64·24	l 64·72 l 64·38	l 65·62 l 63·40 l 64·04	l 65·00 l 62·68 l 65·24	l 63·74 l 63·12	l 58·36 l 62·96 l 63·80 l 62·80 l 63·30 l 64·36	l 63·52 l 64·12	l 64·74 l 63·82	l 63·48 l 63·72	$M = 63''\cdot96$ $w = 9\cdot27$ $\frac{1}{w} = 0\cdot11$ $C = 65^\circ\ 11'\ 3''\cdot96$
	65·19	63·48	64·55	64·35	64·31	63·43	62·60	63·82	64·28	63·60	

At XXIII (Pichĕrla)—(*Continued*).

Angle between	Circle readings, telescope being set on XXII (Nishánkŏnda) 170° 1′	350° 2′	249° 13′	69° 13′	328° 24′	148° 25′	47° 36′	227° 37′	126° 49′	306° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXIV (Kuchĕrla) and XXVII (Chákalakŏnda)	″ l 39·32 l 37·70	″ l 40·36 l 40·12	″ l 39·32 l 39·10	″ l 39·28 l 39·70	″ l 40·40 l 40·86	″ l 39·82 l 40·02	″ l 39·26 l 39·50	″ l 41·00 l 40·34	″ l 38·82 l 38·88	″ l 40·94 l 40·10	M = 39″·74 w = 15 ·50 $\frac{1}{w}$ = 0 ·06
	38·51	40·24	39·21	39·49	40·63	39·92	39·38	40·67	38·85	40·52	C = 57° 33′ 39″·74

At XXIV (Kuchĕrla)

March 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXVI (Kesavaram) 0° 1′	180° 2′	79° 12′	259° 18′	158° 24′	338° 25′	237° 36′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXVI (Kesavaram) and XXVII (Chákalakŏnda)	″ l 19·26 l 21·46 l 19·88	″ l 19·94 l 18·50	″ l 21·28 l 20·74	″ l 21·52 l 22·14 l 21·20 l 21·38 l 21·50	″ l 19·46 l 19·70	″ l 20·00 l 19·72	″ l 21·14 l 19·98	″ l 21·06 l 20·90	″ l 21·38 l 22·44	″ l 19·58 l 19·50	M = 20″·44 w = 10 ·64 $\frac{1}{w}$ = 0 ·09
	20·20	19·22	21·01	21·55	19·58	19·86	20·56	20·98	21·91	19·54	C = 84° 18′ 20″·45
XXVII (Chákalakŏnda) and XXIII (Pichĕrla)	l 34·10 l 32·80	l 32·26 l 32·28	l 31·80 l 31·44	l 32·08 l 31·24	l 32·62 l 32·10	l 31·40 l 33·50 l 33·32	l 32·76 l 31·64	l 31·78 l 32·26	l 33·00 l 32·76	l 33·18 l 32·16	M = 32″·39 w = 22 ·17 $\frac{1}{w}$ = 0 ·05
	33·45	32·27	31·62	31·66	32·36	32·74	32·20	32·02	32·88	32·67	C = 73° 55′ 32″·39
XXIII (Pichĕrla) and XX (Netivaripálĕm)	l 46·00 l 45·24	l 49·02 l 49·04	l 47·94 l 47·46	l 46·28 l 45·64	l 45·82 l 46·50	l 47·24 l 46·72	l 45·98 l 45·36	l 47·48 l 46·40	l 45·32 l 45·96	l 45·16 l 45·28	M = 46″·49 w = 6 ·90 $\frac{1}{w}$ = 0 ·14
	45·62	49·03	47·70	45·96	46·16	46·98	45·67	46·94	45·64	45·22	C = 79° 20′ 46″·49
XX (Netivaripálĕm) and XXI (Puripád)	l 63·12 l 63·76	l 58·82 l 60·94 l 62·28 l 61·36	l 62·72 l 63·32	l 63·80 l 63·98	l 63·48 l 64·38	l 63·30 l 64·26	l 64·18 l 64·44	l 64·08 l 64·76	l 63·22 l 62·84	l 64·54 l 63·96	M = 63″·49 w = 7 ·80 $\frac{1}{w}$ = 0 ·13
	63·44	60·85	63·02	63·89	63·93	63·78	64·31	64·42	63·03	64·25	C = 39° 51′ 3″·47

At XXIV (Kuchĕrla)—(*Continued*).

Angle between	Circle readings, telescope being set on XXVI (Kesavaram) 0° 1′	180° 2′	79° 12′	259° 13′	158° 24′	338° 25′	237° 36′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXI (Puripád) and XXV (Darutippa)	″ l 7·60 l 6·58	″ l 9·34 l 7·06 l 7·68	″ l 7·78 l 5·94	″ l 6·82 l 6·70	″ l 6·88 l 4·26 l 6·50	″ l 7·22 l 5·66	″ l 6·80 l 5·80	″ l 6·18 l 4·58	″ l 7·98 l 6·80	″ l 6·98 l 6·84	$M = 6''\cdot70$ $w = 11\cdot80$ $\frac{1}{w} = 0\cdot08$
	7·09	8·03	6·86	6·76	5·88	6·44	6·30	5·38	7·39	6·91	$C = 47° 48' 6''\cdot71$
XXV (Darutippa) and XXVI (Kesavaram)	l 11·00 l 10·66	l 11·20 l 12·52	l 10·24 l 10·98	l 10·26 l 9·66	l 12·14 l 11·96 l 12·08	l 10·22 l 10·52	l 9·96 l 10·52	l 10·12 l 8·80	l 9·74 l 9·28	l 11·56 l 11·96	$M = 10''\cdot67$ $w = 10\cdot27$ $\frac{1}{w} = 0\cdot10$
	10·83	11·86	10·61	9·96	12·06	10·37	10·24	9·46	9·51	11·76	$C = 34° 46' 10''\cdot67$

At XXV (Darutippa)

March 1864; *observed by Captain B. R. Branfill with Troughton and Simms*' 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXVI (Kesavaram) 148° 54′	328° 55′	228° 6′	48° 6′	307° 18′	127° 19′	26° 30′	206° 30′	105° 42′	285° 43′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXVI (Kesavaram) and XXIV (Kuchĕrla)	″ l 55·06 l 55·40	″ l 54·22 l 53·46	″ l 53·42 l 55·96 l 52·52	″ l 53·24 l 54·68	″ l 53·66 l 53·46	″ l 54·86 l 54·68	″ l 53·02 l 54·76	″ l 55·62 l 54·46	″ l 54·80 l 53·32	″ l 55·48 l 53·18 l 55·30	$M = 54''\cdot30$ $w = 15\cdot50$ $\frac{1}{w} = 0\cdot06$
	55·23	53·84	53·97	53·96	53·56	54·77	53·89	55·04	54·06	54·65	$C = 65° 27' 54''\cdot30$
XXIV (Kuchĕrla) and XXI (Puripád)	l 14·14 l 12·78 h 13·26	l 15·82 l 15·30	l 15·38 l 14·30	l 14·78 l 11·58 l 12·22 l 13·16	l 14·42 l 16·26	l 13·18 l 13·36	l 15·78 l 13·36 l 15·30	l 13·12 l 13·62	l 13·74 l 17·22 l 14·64 l 15·36	l 14·28 l 15·62	$M = 14''\cdot37$ $w = 7\cdot48$ $\frac{1}{w} = 0\cdot13$
	13·39	15·56	14·84	12·94	15·34	13·27	14·81	13·37	15·24	14·95	$C = 83° 25' 14''\cdot36$

At XXVI (Kesavaram)

March 1864; *observed by Captain B. R. Branfill with Troughton and Simms*' 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXIX (Nishánbodu) 251° 30′	71° 31′	330° 43′	150° 43′	49° 54′	229° 55′	129° 6′	309° 7′	208° 18′	28° 19′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXIX (Nishánbodu) and XXVIII (Rájalli)	″ l 44·54 l 44·06	″ l 44·08 l 44·60	″ l 45·10 l 45·62	″ l 44·46 l 45·12	″ l 45·20 l 43·84	″ l 44·86 l 44·56	″ l 45·60 l 44·08	″ l 45·14 l 44·48	″ l 44·50 l 44·70	″ l 43·12 l 44·56	$M = 44''\cdot61$ $w = 37\cdot75$ $\frac{1}{w} = 0\cdot03$
	44·30	44·34	45·36	44·79	44·52	44·71	44·84	44·81	44·60	43·84	$C = 71° 43' 44''\cdot61$

At XXVI (Kesavaram)—(*Continued*).

Angle between	Circle readings, telescope being set on XXIX (Nishánbodu) 251° 30′	71° 31′	330° 43′	150° 43′	49° 54′	229° 55′	129° 6′	309° 7′	208° 18′	28° 19′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXVIII (Rájalli) and XXVII (Chákalakŏnda)	*l* 39·98 *l* 39·18	*l* 37·76 *l* 39·00	*l* 37·44 *l* 36·46	*l* 37·50 *l* 38·26	*l* 38·10 *l* 38·16	*h* 37·52 *h* 38·34 *d* 38·62 *d* 37·56	*l* 38·98 *l* 38·50	*l* 39·24 *l* 38·70	*l* 38·74 *l* 39·56	*l* 39·06 *l* 37·62	$M = 38''\cdot41$ $w = 15\cdot43$ $\frac{1}{w} = 0\cdot06$
	39·58	38·38	36·95	37·88	38·13	38·01	38·74	38·97	39·15	38·34	$C = 51^\circ\ 50'\ 38''\cdot41$
XXVII (Chákalakŏnda) and XXIV (Kuchĕrla)	*l* 31·78 *l* 31·74	*l* 31·50 *l* 31·12	*l* 33·66 *l* 32·10	*l* 33·10 *l* 30·92 *l* 30·96	*l* 31·82 *l* 32·06	*h* 32·10 *h* 30·58 *d* 32·03 *d* 30·97	*l* 30·16 *l* 30·98	*l* 32·50 *l* 31·48	*l* 31·14 *l* 30·02	*l* 32·40 *l* 32·38	$M = 31''\cdot65$ $w = 14\cdot51$ $\frac{1}{w} = 0\cdot07$
	31·76	31·31	32·88	31·66	31·94	31·42	30·57	31·99	30·58	32·39	$C = 48^\circ\ 9'\ 31''\cdot65$
XXIV (Kuchĕrla) and XXV (Darutippa)	*l* 55·74 *l* 54·94	*l* 56·42 *l* 56·00	*l* 55·54 *l* 55·36	*l* 55·40 *l* 55·64	*l* 56·66 *l* 56·76	*l* 55·52 *l* 55·32	*l* 56·10 *l* 55·60	*l* 55·24 *l* 55·98	*l* 55·82 *l* 56·78	*l* 55·06 *l* 55·90	$M = 55''\cdot79$ $w = 37\cdot75$ $\frac{1}{w} = 0\cdot03$
	55·34	56·21	55·45	55·52	56·71	55·42	55·85	55·61	56·30	55·48	$C = 79^\circ\ 45'\ 55''\cdot79$

At XXVII (Chákalakŏnda)

March 1864; *observed by Captain B. R. Branfill with Troughton and Simms*' 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXIII (Pichĕrla) 226° 31′	46° 32′	305° 42′	125° 43′	24° 54′	204° 54′	104° 6′	284° 7′	183° 18′	3° 19′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXIII (Pichĕrla) and XXIV (Kuchĕrla)	*l* 49·06 *l* 50·14	*l* 50·40 *l* 49·54	*l* 49·42 *l* 48·98	*l* 50·30 *l* 51·02	*l* 49·50 *l* 49·02	*l* 49·26 *l* 48·54	*l* 49·84 *l* 48·54	*l* 50·08 *l* 48·72	*l* 54·78 *l* 54·18 *l* 50·50 *l* 52·82	*l* 54·88 *l* 54·44 *l* 50·06 *l* 49·50	$M = 50''\cdot15$ $w = 3\cdot62$ $\frac{1}{w} = 0\cdot28$
	49·60	49·97	49·20	50·66	49·26	48·90	49·19	49·40	53·07	52·22	$C = 48^\circ\ 30'\ 50''\cdot23$
XXIV (Kuchĕrla) and XXVI (Kesavaram)	*l* 10·02 *l* 9·30	*l* 8·72 *l* 8·52	*l* 11·98 *l* 9·62 *l* 10·46	*l* 9·90 *l* 9·52	*l* 8·72 *h* 12·60 *l* 8·12 *d* 7·57	*l* 10·10 *l* 10·86	*l* 8·74 *l* 9·22	*l* 9·36 *l* 8·82	*l* 7·12 *l* 8·08	*l* 9·22 *l* 6·12 *l* 10·00 *d* 8·39 *d* 4·37	$M = 9''\cdot17$ $w = 5\cdot61$ $\frac{1}{w} = 0\cdot18$
	9·66	8·62	10·69	9·71	9·25	10·48	8·98	9·09	7·60	7·62	$C = 47^\circ\ 32'\ 9''\cdot15$

At XXVII (Chákalakŏnda)—(*Continued*).

Angle between	Circle readings, telescope being set on XXIII (Pichĕrla) 226° 31′	46° 32′	305° 42′	125° 43′	24° 54′	204° 54′	104° 6′	284° 7′	183° 18′	3° 19′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXVI (Kesavaram) and XXVIII (Rájalli)	″ *l* 21·10 *l* 19·22	″ *l* 19·70 *l* 17·90	″ *l* 21·14 *l* 20·90 *l* 20·94	″ *l* 20·70 *l* 19·36	″ *l* 23·02 *h* 21·36 *l* 22·48 *d* 20·05	″ *l* 20·32 *l* 20·84	″ *l* 19·76 *l* 20·92	″ *l* 20·82 *l* 21·44	″ *l* 21·64 *l* 22·06	″ *l* 20·22 *l* 25·04 *l* 21·38 *d* 22·15 *d* 18·13	$M = 20''\cdot70$ $w = 6\cdot94$ $\frac{1}{w} = 0\cdot14$
	20·16	18·80	20·99	20·03	21·73	20·58	20·34	21·13	21·85	21·38	$C = 61^\circ\,37'\,20''\cdot75$
XXVIII (Rájalli) and XXX (Yĕrrakŏnda)	*l* 12·00 *l* 11·90	*l* 13·72 *l* 12·66	*l* 13·30 *l* 10·60 *l* 12·28	*l* 11·96 *l* 12·24	*l* 8·80 *l* 14·10 *h* 12·60 *l* 11·56 *l* 13·36 *l* 14·80	*l* 14·84 *l* 13·50	*l* 15·84 *l* 13·02 *l* 15·32	*l* 15·14 *l* 11·84 *l* 11·60 *l* 10·82	*l* 9·54 *l* 9·84	*l* 12·46 *l* 11·20	$M = 12''\cdot46$ $w = 3\cdot84$ $\frac{1}{w} = 0\cdot26$
	11·95	13·19	12·06	12·10	12·54	14·17	14·73	12·35	9·69	11·83	$C = 68^\circ\,49'\,12''\cdot48$

At XXVIII (Rájalli)

March and April 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXVI (Kesavaram) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 38′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXVI (Kesavaram) and XXIX (Nishánbodu)	″ *l* 20·62 *l* 23·18 *d* 22·04	″ *l* 23·02 *l* 23·74	″ *l* 21·84 *l* 22·10	″ *l* 22·00 *h* 20·50 *h* 22·72	″ *l* 22·72 *l* 21·06	″ *l* 22·02 *l* 21·64	″ *l* 21·46 *l* 20·76	″ *l* 21·20 *l* 20·16 *d* 21·36	″ *l* 22·48 *l* 20·66 *l* 21·56	″ *l* 21·94 *h* 19·50 *h* 19·22 *d* 21·11	$M = 21''\cdot68$ $w = 11\cdot48$ $\frac{1}{w} = 0\cdot09$
	21·95	23·38	21·97	21·74	21·89	21·83	21·11	20·91	21·57	20·44	$C = 47^\circ\,27'\,21''\cdot65$
XXIX (Nishánbodu) and XXXI (Kistama)	*l* 46·64 *l* 45·44 *d* 46·18	*l* 45·54 *l* 45·50	*l* 47·20 *l* 46·72 *d* 47·15 *d* 47·35 *d* 47·25	*l* 48·96 *l* 48·32	*l* 46·08 *l* 46·50	*l* 47·46 *l* 46·94	*l* 48·06 *l* 47·56	*l* 47·40 *l* 47·18	*l* 47·48 *l* 48·64 *d* 48·69	*l* 46·50 *l* 45·56 *h* 47·36	$M = 47''\cdot07$ $w = 9\cdot54$ $\frac{1}{w} = 0\cdot10$
	46·09	45·52	47·13	48·64	46·29	47·20	47·81	47·29	48·27	46·47	$C = 59^\circ\,20'\,47''\cdot07$

At XXVIII (Rájalli)—(*Continued*).

Angle between	Circle readings, telescope being set on XXVI (Kesavaram) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 38′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXI (Kistama) and XXXII (Pallakŏnda)	*l* 17·76 *l* 18·54	*l* 16·94 *l* 17·08	*l* 16·98 *l* 17·76 *d* 17·56 *d* 17·76 *d* 17·67	*l* 15·68 *l* 17·24	*l* 18·54 *l* 17·24	*l* 17·00 *l* 17·00	*l* 16·52 *l* 17·22 *d* 15·67	*l* 17·18 *l* 16·42 *d* 17·65	*l* 17·72 *l* 15·98 *d* 17·48	*l* 19·14 *h* 16·90 *h* 15·72 *h* 18·50	$M = 17''·22$ $w = 19·78$ $\frac{1}{w} = 0·05$
	18·15	17·01	17·55	16·46	17·89	17·00	16·47	17·08	17·06	17·57	$C = 53° 35' 17''·22$
XXXII (Pallakŏnda) and XXX (Yĕrrakŏnda)	*l* 34·60 *l* 34·46	*l* 35·32 *l* 33·42	*l* 34·30 *l* 33·74 *d* 34·17	*l* 33·28 *h* 33·50 *d* 32·91 *d* 32·51	*l* 32·40 *l* 34·30	*l* 33·34 *l* 33·56	*l* 35·56 *l* 34·08 *d* 36·91 *d* 34·32	*h* 34·16 *l* 34·68 *d* 35·67 *d* 35·61	*l* 34·00 *l* 32·96	*h* 36·50 *h* 34·54 *d* 35·27	$M = 34''·20$ $w = 10·80$ $\frac{1}{w} = 0·09$
	34·53	34·37	34·07	33·05	33·35	33·45	35·22	35·03	33·48	35·44	$C = 65° 15' 34''·22$
XXX (Yĕrrakŏnda) and XXVII (Chákalakŏnda)	*l* 56·44 *l* 57·66	*l* 55·64 *l* 56·82	*l* 57·04 *l* 58·66 *d* 58·10 *d* 58·15	*l* 56·58 *h* 56·64 *d* 56·13 *d* 55·73	*l* 57·62 *l* 56·42	*l* 58·96 *l* 57·02	*l* 56·90 *l* 55·20 *d* 58·14 *d* 55·55	*l* 57·52 *h* 55·30 *l* 57·06 *d* 57·78 *d* 57·82	*l* 57·32 *l* 56·06 *l* 58·18	*h* 56·78 *h* 59·20 *h* 55·40 *d* 56·88	$M = 57''·04$ $w = 15·23$ $\frac{1}{w} = 0·07$
	57·05	56·23	57·99	56·27	57·02	57·99	56·45	57·10	57·19	57·07	$C = 67° 48' 57''·03$
XXVII (Chákalakŏnda) and XXVI (Kesavaram)	*l* 2·78 *l* 3·26 *l* 1·42	*l* 2·58 *l* 2·58	*l* 2·32 *l* 1·82 *d* 2·37	*l* 2·08 *l* 4·78 *l* 2·34 *h* 3·04	*h* 3·78 *l* 3·36 *l* 4·26	*l* 1·82 *l* 1·44	*l* 1·72 *l* 2·80	*h* 4·22 *h* 3·42 *d* 4·50	*l* 1·24 *l* 3·70 *l* 1·70	*l* 2·50 *h* 2·34 *h* 3·12 *d* 3·54	$M = 2''·71$ $w = 13·66$ $\frac{1}{w} = 0·07$
	2·49	2·58	2·17	3·06	3·80	1·63	2·26	4·05	2·21	2·88	$C = 66° 32' 2''·73$

At XXIX (Nishánbodu)

April 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXI (Kistama) 117° 39′	297° 40′	196° 51′	16° 52′	276° 3′	96° 3′	355° 15′	175° 15′	74° 27′	254° 28′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXI (Kistama) and XXVIII (Rájalli)	*l* 25·82 *l* 24·78	*l* 25·44 *l* 24·34	*l* 27·12 *l* 26·48	*l* 25·14 *l* 25·02	*l* 25·30 *l* 24·34	*l* 25·44 *l* 23·30 *l* 24·82	*l* 26·70 *l* 25·88	*l* 25·68 *l* 25·18	*l* 26·76 *l* 25·30	*l* 26·10 *l* 27·02	$M = 25''·57$ $w = 12·84$ $\frac{1}{w} = 0·08$
	25·30	24·89	26·80	25·08	24·82	24·52	26·29	25·43	26·03	26·56	$C = 56° 49' 25''·56$

At XXIX (Nishánbodu)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXI (Kistama)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	117° 39′	297° 40′	196° 51′	16° 52′	276° 3′	96° 3′	355° 15′	175° 15′	74° 27′	254° 28′	
XXVIII (Rájalli) and XXVI (Kesavaram)	″ *l* 55·36 *l* 54·34	″ *l* 55·32 *l* 54·80	″ *l* 54·24 *l* 54·60	″ *l* 55·24 *l* 55·80	″ *l* 56·52 *l* 55·54	″ *l* 56·10 *l* 55·96	″ *l* 54·04 *l* 53·38	″ *l* 54·60 *l* 54·38	″ *l* 53·90 *l* 54·72	″ *l* 56·12 *l* 56·32	$M = 55''\cdot06$ $w = 12\cdot80$ $\frac{1}{w} = 0\cdot08$
	54·85	55·06	54·42	55·52	56·03	56·03	53·71	54·49	54·31	56·22	$C = 60° 48' 55''\cdot06$

At XXX (Yĕrrakŏnda)

***March* 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XXVII (Chákalakŏnda)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	102° 40′	282° 40′	181° 51′	1° 52′	261° 3′	81° 4′	340° 15′	160° 16′	59° 27′	239° 27′	
XXVII (Chákalakŏnda) and XXVIII (Rájalli)	″ *l* 53·86 *l* 53·86	″ *l* 55·48 *l* 53·04 *l* 54·62	″ *l* 53·64 *l* 52·32	″ *l* 52·22 *l* 53·00	″ *l* 53·16 *l* 52·82	″ *h* 54·04 *h* 51·58 *h* 52·88 *h* 54·36	″ *l* 53·40 *l* 54·50	″ *l* 54·54 *l* 53·28	″ *l* 55·36 *l* 53·40	″ *l* 52·40 *l* 52·94	$M = 53''\cdot50$ $w = 13\cdot93$ $\frac{1}{w} = 0\cdot07$
	53·86	54·38	52·98	52·61	52·99	53·22	53·95	53·91	54·38	52·67	$C = 43° 21' 53''\cdot51$
XXVIII (Rájalli) and XXXII (Pallakŏnda)	*l* 24·80 *l* 21·84 *l* 21·82	*l* 23·62 *l* 22·38	*l* 24·20 *l* 22·96	*l* 23·34 *l* 22·46	*h* 26·10 *h* 24·36	*h* 21·62 *h* 23·34 *h* 24·08 *h* 23·70	*l* 24·52 *l* 22·26 *l* 23·56	*l* 22·86 *l* 23·20	*l* 23·02 *l* 23·04	*l* 26·04 *l* 25·40	$M = 23''\cdot60$ $w = 7\cdot42$ $\frac{1}{w} = 0\cdot13$
	22·82	23·00	23·58	22·90	25·23	23·19	23·45	23·03	23·03	25·72	$C = 55° 59' 23''\cdot59$

At XXXI (Kistama)

****April* 1864; *and* †*December* 1864; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XXXIV (Bandalduru)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	195° 27′	15° 27′	274° 39′	94° 39′	353° 51′	173° 51′	73° 3′	253° 3′	152° 16′	332° 16′	
† XXXIV (Bandalduru) and XXXIII (Vutukúr)	″ *l* 37·34 *l* 40·36 *l* 40·44 *l* 39·38	″ *l* 36·64 *l* 36·90 *l* 37·26	″ *l* 38·38 *l* 38·36	″ *l* 38·38 *l* 37·06	″ *l* 37·28 *l* 37·70	″ *l* 36·86 *l* 37·38	″ *l* 35·92 *l* 39·08	″ *l* 41·00 *l* 39·60	″ *l* 41·08 *l* 39·24	″ *l* 38·42 *l* 38·92	$M = 38''\cdot36$ $w = 5\cdot48$ $\frac{1}{w} = 0\cdot18$
	39·38	36·93	38·37	37·72	37·49	37·12	37·50	40·30	40·16	38·67	$C = 61° 44' 38''\cdot36$

At XXXI (Kistama)—(*Continued*).

Circle readings, telescope being set on XXXIV (Bandalduru)

Angle between	195° 27′	15° 27′	274° 39′	94° 39′	353° 51′	173° 51′	73° 3′	253° 3′	152° 16′	332° 16′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XXXIII (Vutukúr) and XXXII (Pallakŏnda)	″ l 54·84 l 53·64 l 54·22 l 56·56	″ l 56·38 l 56·54 l 56·74	″ l 56·48 l 54·72	″ l 57·42 l 56·52	″ l 55·54 l 57·26	″ l 58·74 l 54·30 l 55·56 l 56·62 l 55·04	″ l 59·38 l 54·38 l 56·86 l 56·24 l 57·04	″ l 55·26 l 54·20	″ l 53·58 l 57·36 l 54·60	″ l 55·92 l 56·66	$M = 55''·94$ $w = 8·52$ $\frac{1}{w} = 0·12$
	54·82	56·55	55·60	56·97	56·40	56·05	56·78	54·73	55·18	56·29	$C = 67° 54′ 55''·94$
† XXXII (Pallakŏnda) and Referring Mark	l 62·26 l 63·00 l 62·64	l 62·16 l 61·58 l 60·40	l 60·52 l 62·72 l 61·20	l 60·54 l 61·66	l 65·28 l 60·60 l 63·30 l 62·92 l 63·12	l 58·66 l 64·36 l 62·88 l 63·18 l 62·86 l 62·00	l 58·08 l 62·96 l 62·52 l 63·02 l 60·90	l 62·86 l 60·44	l 60·42 l 59·56	l 60·74 l 62·40	$M = 61''·67$ $w = 7·60$ $\frac{1}{w} = 0·13$
	62·63	61·38	61·48	61·10	63·04	62·32	61·50	61·65	59·99	61·57	$C = 65° 47′ 1''·76$

Circle readings, telescope being set on XXXII (Pallakŏnda)

Angle between	135° 24′	315° 25′	214° 36′	34° 36′	293° 48′	113° 48′	13° 0′	193° 0′	92° 12′	272° 13′	
* XXXII (Pallakŏnda) and XXVIII (Rájalli)	″ l 27·60 l 27·26 l 28·54 l 28·72	″ l 27·50 l 27·58	″ l 27·30 l 26·22	″ l 27·22 l 27·22	″ l 27·84 l 28·20	″ l 27·80 l 27·06	″ l 26·66 l 26·80	″ l 27·22 l 27·34	″ l 27·36 l 27·04	″ l 28·12 l 28·36	$M = 27''·45$ $w = 30·60$ $\frac{1}{w} = 0·03$
	28·03	27·54	26·76	27·22	28·02	27·43	26·73	27·28	27·20	28·24	$C = 71° 33′ 27''·46$
* XXVIII (Rájalli) and XXIX (Nishánbodu)	l 49·30 l 48·34	l 51·58 l 49·36 l 49·18	l 49·40 l 50·12	l 49·68 l 51·20	l 50·82 l 49·62	l 50·64 l 50·20	l 49·34 l 49·70	l 51·06 l 50·14 l 50·46	l 50·02 l 50·04	l 50·00 l 49·96	$M = 49''·98$ $w = 23·90$ $\frac{1}{w} = 0·04$
	48·82	50·04	49·76	50·44	50·22	50·42	49·52	50·55	50·03	49·98	$C = 63° 49′ 49''·99$

At XXXII (Pallakŏnda)

**April* 1864; *and* †*December* 1864; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Circle readings, telescope being set on XXX (Yĕrrakŏnda)

Angle between	113° 37′	293° 38′	192° 49′	12° 50′	272° 1′	92° 2′	351° 13′	171° 14′	70° 25′	250° 26′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* XXX (Yĕrrakŏnda) and XXVIII (Rájalli)	″ l 8·64 l 8·36	″ l 7·74 l 6·34	″ l 9·16 l 9·20	″ l 6·14 l 6·34	″ l 7·20 l 6·66	″ l 6·98 l 6·48	″ l 7·08 l 6·48	″ l 7·22 l 4·56 l 6·68	″ l 9·36 l 7·80	″ l 7·52 l 6·42	$M = 7''·31$ $w = 7·83$ $\frac{1}{w} = 0·13$
	8·50	7·04	9·18	6·24	6·93	6·73	6·78	6·15	8·58	6·97	$C = 58° 45′ 7''·31$

At XXXII (Pallakŏnda)—(*Continued*).

Angle between	Circle readings, telescope being set on XXX (Yĕrrakŏnda) 113°37′	293°38′	192°49′	12°50′	272°1′	92°2′	351°13′	171°14′	70°25′	250°26′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
* XXVIII (Rájalli) and XXXI (Kistama)	″ l 14·84 l 16·18	″ l 17·02 l 17·28	″ l 16·30 l 16·06	″ l 16·80 l 16·28	″ l 18·06 l 17·38	″ l 16·56 l 16·72	″ l 16·72 l 17·04	″ l 20·00 l 17·28 l 16·90 l 16·96	″ l 16·70 l 16·06	″ l 17·46 l 18·24	M = 16″·86 w = 12·78 $\frac{1}{w}$ = 0·08
	15·51	17·15	16·18	16·54	17·72	16·64	16·88	17·79	16·38	17·85	C = 54° 51′ 16″·87

Angle between	Circle readings, telescope being set on XXXI (Kistama) 99°13′	279°13′	178°26′	358°26′	257°38′	77°38′	336°50′	156°49′	56°2′	236°2′	
† XXXI (Kistama) and XXXIII (Vutukúr)	″ l 27·06 l 26·74	″ l 23·80 l 26·78 l 27·48 l 27·54	″ l 27·20 l 25·38	″ l 24·16 l 25·00	″ l 26·56 l 26·96	″ l 25·94 l 28·36 l 25·52	″ l 26·08 l 28·30 l 27·14	″ l 25·96 l 25·46	″ l 26·04 l 27·46	″ l 27·52 l 26·00	M = 26″·39 w = 10·45 $\frac{1}{w}$ = 0·10
	26·90	26·40	26·29	24·58	26·76	26·61	27·17	25·71	26·75	26·76	C = 45° 1′ 26″·41
† XXXIII (Vutukúr) and XXXV (Pálchĕrla)	l 41·78 l 39·68 l 40·74	l 39·76 l 39·80	l 39·20 l 39·60	l 39·12 l 42·74 l 40·82 l 39·14	l 39·34 l 40·12	l 40·18 l 38·70	l 36·56 l 38·06	l 40·90 l 41·98	l 38·32 l 39·10	l 41·46 l 40·42	M = 39″·79 w = 5·70 $\frac{1}{w}$ = 0·18
	40·73	39·78	39·40	40·46	39·73	39·44	37·31	41·44	38·71	40·94	C = 54° 11′ 39″·80

At XXXIII (Vutukúr)

January 1865; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXI (Kistama) 0°1′	180°1′	79°13′	259°13′	158°25′	338°25′	237°36′	57°36′	316°49′	136°49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXXI (Kistama) and XXXIV (Bandalduru)	″ l 25·22 l 24·20	″ l 24·58 l 24·26	″ l 24·96 l 25·42	″ l 24·64 l 24·04	″ l 24·72 l 23·28	″ l 25·08 l 26·28	″ l 23·72 l 24·22	″ l 25·24 l 22·68 l 24·62	″ l 23·82 l 24·82	″ l 24·72 l 25·34	M = 24″·58 w = 20·69 $\frac{1}{w}$ = 0·05
	24·71	24·42	25·19	24·34	24·00	25·68	23·97	24·18	24·32	25·03	C = 62° 3′ 24″·57
XXXIV (Bandalduru) and XXXVII (Gurramkŏnda)	l 10·12 l 9·60	l 9·66 l 10·28	l 9·74 l 8·70	l 9·48 l 10·16	l 9·64 l 9·60	l 10·78 l 9·40	l 9·04 l 9·66	l 9·54 l 10·82	l 11·26 l 9·64	l 10·92 l 10·14	M = 9″·91 w = 32·30 $\frac{1}{w}$ = 0·03
	9·86	9·97	9·22	9·82	9·62	10·09	9·35	10·18	10·45	10·53	C = 77° 8′ 9″·91

At XXXIII (Vutukúr)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXI (Kistama) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 36′	57° 36′	316° 49′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXXVII (Gurramkŏnda) and XXXVI (Kayyúr)	″ l 27·10 l 27·64	″ l 27·84 l 28·36	″ l 27·64 l 27·48	″ l 27·64 l 26·66	″ l 27·90 l 26·60	″ l 27·24 l 27·18	″ l 28·12 l 27·56	″ l 25·36 l 26·32	″ l 27·52 l 27·52	″ l 25·24 l 26·68	$M = 27''\cdot18$ $w = 15\cdot90$ $\frac{1}{w} = 0\cdot06$
	27·37	28·10	27·56	27·15	27·25	27·21	27·84	25·84	27·52	25·96	$C = 40° 27' 27''\cdot18$
XXXVI (Kayyúr) and XXXV (Pálchĕrla)	l 55·56 l 54·66	l 55·08 l 54·08	l 54·90 l 56·58	l 55·58 l 56·48	l 56·64 l 57·26	l 54·34 l 54·20	l 55·72 l 56·08	l 57·78 l 56·32	l 55·22 l 54·32	l 55·42 l 55·44	$M = 55''\cdot58$ $w = 9\cdot90$ $\frac{1}{w} = 0\cdot10$
	55·11	54·58	55·74	56·03	56·95	54·27	55·90	57·05	54·77	55·43	$C = 61° 45' 55''\cdot58$
XXXV (Pálchĕrla) and XXXII (Pallakŏnda)	l 23·06 l 24·72	l 22·52 l 22·66	l 25·64 l 24·96	l 22·90 l 22·08	l 22·82 l 23·24	l 22·68 l 23·52	l 24·48 l 22·70	l 23·10 l 22·90	l 25·12 l 24·12	l 26·08 l 25·42	$M = 23''\cdot74$ $w = 7\cdot00$ $\frac{1}{w} = 0\cdot14$
	23·89	22·59	25·30	22·49	23·03	23·10	23·59	23·00	24·62	25·75	$C = 51° 31' 23''\cdot74$
XXXII (Pallakŏnda) and XXXI (Kistama)	l 40·62 l 38·16 l 39·64	l 40·56 l 40·36	l 37·96 l 38·08	l 38·64 l 39·58	l 39·08 l 39·74	l 38·84 l 38·76	l 39·42 l 39·26	l 38·84 l 39·18	l 37·50 l 38·48	l 38·36 l 37·64	$M = 38''\cdot96$ $w = 13\cdot38$ $\frac{1}{w} = 0\cdot07$
	39·47	40·46	38·02	39·11	39·41	38·80	39·34	39·01	37·99	38·00	$C = 67° 3' 38''\cdot96$

At XXXIV (Bandalduru)

January 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXVIII (Gudali) 146° 25′	326° 25′	225° 37′	45° 37′	304° 49′	124° 49′	24° 1′	204° 1′	103° 13′	283° 13′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXXVIII (Gudali) and XXXVII (Gurramkŏnda)	″ l 7·12 l 7·90	″ l 7·12 l 8·16	″ l 7·74 l 8·90	″ l 7·22 l 8·14	″ l 9·98 l 8·32	″ l 8·38 l 8·12	″ l 8·04 l 9·96	″ l 6·12 l 6·04 l 8·34	″ l 9·78 l 9·38	″ l 6·12 l 8·48	$M = 8''\cdot13$ $w = 9\cdot39$ $\frac{1}{w} = 0\cdot11$
	7·51	7·64	8·32	7·68	9·15	8·25	9·00	6·83	9·58	7·30	$C = 34° 43' 8''\cdot12$

At XXXIV (Bandalduru)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXVIII (Gudali) 146° 25′	326° 25′	225° 37′	45° 37′	304° 49′	124° 49′	24° 1′	204° 1′	103° 13′	283° 13′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXXVII (Gurramkŏnda) and XXXIII (Vutukúr)	″ *l* 22·22 *l* 22·60	″ *l* 23·32 *l* 23·68	″ *l* 23·16 *l* 23·38	″ *l* 22·74 *l* 22·50	″ *l* 22·36 *l* 23·50	″ *l* 22·44 *l* 23·02	″ *l* 22·74 *l* 22·26	″ *l* 24·00 *l* 21·52 *l* 21·68	″ *l* 23·32 *l* 21·84	″ *l* 22·60 *l* 22·68	*M* = 22″·76 *w* = 35 ·22 $\frac{1}{w}$ = 0 ·03
	22·41	23·50	23·27	22·62	22·93	22·73	22·50	22·40	22·58	22·64	*C* = 55° 29′ 22″·75
XXXIII (Vutukúr) and XXXI (Kistama)	*l* 58·90 *l* 58·80	*l* 59·02 *l* 56·34 *l* 56·50	*l* 57·50 *l* 57·66	*l* 59·44 *l* 58·82	*l* 60·44 *l* 58·78	*l* 57·66 *l* 57·84	*l* 58·88 *l* 56·80 *l* 57·76	*l* 59·14 *l* 60·64	*l* 58·70 *l* 59·72	*l* 59·60 *l* 57·20 *l* 59·34	*M* = 58″·58 *w* = 9 ·07 $\frac{1}{w}$ = 0 ·11
	58·85	57·29	57·58	59·13	59·61	57·75	57·81	59·89	59·21	58·71	*C* = 56° 11′ 58″·56

At XXXV (Pálchĕrla)

January 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXII (Pallakŏnda) 131° 51′	311° 51′	211° 2′	31° 2′	290° 14′	110° 14′	9° 26′	189° 26′	88° 39′	268° 39′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXXII (Pallakŏnda) and XXXIII (Vutukúr)	″ *l* 58·36 *l* 57·88	″ *l* 56·20 *l* 58·96 *l* 58·06	″ *l* 59·42 *l* 60·74	″ *l* 61·46 *l* 58·60 *l* 60·20	″ *l* 58·14 *l* 59·16	″ *l* 59·68 *l* 59·12	″ *l* 57·00 *l* 60·40 *l* 58·68	″ *l* 58·46 *l* 58·00	″ *l* 59·40 *l* 62·36 *l* 57·60 *h* 59·66 *h* 58·08	″ *h* 57·92 *h* 57·72	*M* = 58″·82 *w* = 8 ·01 $\frac{1}{w}$ = 0 ·12
	58·12	57·74	60·08	60·09	58·65	59·40	58·69	58·23	59·42	57·82	*C* = 74° 16′ 58″·84
XXXIII (Vutukúr) and XXXVI (Kayyúr)	*l* 47·16 *l* 47·64	*l* 47·60 *l* 46·62	*l* 44·98 *l* 47·12 *l* 47·36	*l* 44·78 *l* 46·34	*l* 48·66 *l* 46·50 *l* 47·26	*l* 46·54 *l* 46·50	*l* 44·84 *l* 46·74	*l* 47·98 *l* 50·38 *l* 47·40 *l* 47·56	*l* 46·68 *l* 47·28	*l* 47·16 *l* 46·80	*M* = 46″·86 *w* = 10 ·36 $\frac{1}{w}$ = 0 ·10
	47·40	47·11	46·49	45·56	47·47	46·52	45·79	48·33	46·98	46·98	*C* = 57° 32′ 46″·89

At XXXVI (Kayyúr)

February 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXV (Pálchĕrla) 209° 29′	29° 29′	288° 40′	108° 40′	7° 52′	187° 52′	87° 5′	267° 5′	166° 17′	346° 16′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXXV (Pálchĕrla) and XXXIII (Vutukúr)	″ *l* 19·46 *l* 18·80	″ *l* 19·18 *l* 19·40	″ *l* 20·02 *l* 20·18	″ *l* 19·86 *l* 19·98	″ *l* 18·28 *l* 19·30	″ *l* 20·40 *l* 19·42	″ *l* 18·52 *l* 19·06	″ *l* 20·18 *l* 20·58	″ *l* 18·92 *l* 18·74	″ *l* 17·02 *l* 19·20	*M* = 19″·33 *w* = 15 ·90 $\frac{1}{w}$ = 0 ·06
	19·13	19·29	20·10	19·92	18·79	19·91	18·79	20·38	18·83	18·11	*C* = 60° 41′ 19″·33

At XXXVI (Kayyúr)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXV (Pálchĕrla) 209° 29′	29° 29′	288° 40′	108° 40′	7° 52′	187° 52′	87° 5′	267° 5′	166° 17′	346° 16′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXXIII (Vutukúr) and XXXVII (Gurramkŏnda)	″	″	″	″	″	″	″	″	″	″	
	l 45·64	l 44·14	l 45·04	l 42·44	l 44·04	l 44·60	l 44·14	l 43·80	l 44·70	l 46·12	M = 44″·23
	l 43·98	l 43·38	l 43·54	l 42·68	l 45·34	l 43·98	l 45·08	l 43·22	l 44·52	l 45·56	w = 10·39
			l 43·32								$\frac{1}{w}$ = 0·10
			l 42·68								
	44·81	43·76	43·65	42·56	44·69	44·29	44·61	43·51	44·61	45·84	C = 77° 55′ 44″·22
XXXVII (Gurramkŏnda) and XL (Pillimedu)	l 47·38	l 48·50	l 48·46	l 49·30	l 49·72	l 48·32	l 47·60	l 48·98	l 48·96	l 47·88	M = 48″·41
	l 47·36	l 48·38	l 48·36	l 50·40	l 48·28	l 48·00	l 48·12	l 48·62	l 48·44	l 47·10	w = 16·40
											$\frac{1}{w}$ = 0·06
	47·37	48·44	48·41	49·85	49·00	48·16	47·86	48·80	48·70	47·49	C = 70° 50′ 48″·41

At XXXVII (Gurramkŏnda)

January 1865; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XL (Pillimedu) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 36′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XL (Pillimedu) and XXXVI (Kayyúr)	″	″	″	″	″	″	″	″	″	″	
	l 27·12	l 28·80	l 28·78	h 29·78	l 28·78	l 28·16	h 28·74	h 27·10	l 27·86	l 29·32	M = 28″·48
	l 28·60	l 29·16	l 28·48	h 28·80	l 26·92	l 27·86	h 29·18	h 28·86	l 28·46	l 29·34	w = 22·09
										h 28·52	$\frac{1}{w}$ = 0·05
										h 29·08	
	27·86	28·98	28·63	29·29	27·85	28·01	28·96	27·98	28·16	29·07	C = 52° 42′ 28″·49
XXXVI (Kayyúr) and XXXIII (Vutukúr)	l 51·56	l 49·52	l 51·40	h 50·06	l 49·10	l 50·20	h 49·48	h 48·74	l 51·80	l 49·76	M = 49″·73
	l 49·72	l 48·38	l 50·04	h 49·12	l 49·06	l 49·04	h 49·60	h 49·44	l 52·44	l 46·48	w = 6·16
										h 48·40	$\frac{1}{w}$ = 0·16
										h 47·16	
	50·64	48·95	50·72	49·59	49·08	49·62	49·54	49·09	52·12	47·95	C = 61° 36′ 49″·71
XXXIII (Vutukúr) and XXXIV (Bandalduru)	l 27·26	l 28·14	l 27·58	h 29·82	l 30·62	l 29·16	h 30·86	h 28·84	l 26·82	l 27·16	M = 28″·46
	l 27·94	l 28·06	l 27·76	h 29·78	l 29·98	l 29·26	h 26·80	h 28·22	l 26·56	l 26·82	w = 6·80
							h 28·02			h 30·20	$\frac{1}{w}$ = 0·15
							h 27·70			h 29·08	
							h 28·74				
	27·60	28·10	27·67	29·80	30·30	29·21	28·42	28·53	26·69	28·32	C = 47° 22′ 28″·46

At XXXVII (Gurramkŏnda)—(*Continued*).

Angle between	Circle readings, telescope being set on XL (Pillimedu) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 36′	316° 49′	136° 49′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXXIV (Bandalduru) and XXXVIII (Gudali)	″ *l* 5·32 *l* 5·76	″ *l* 6·26 *l* 5·94	″ *l* 3·74 *l* 4·84 *h* 6·28	″ *h* 4·18 *h* 6·04	″ *l* 4·02 *l* 4·94	″ *l* 4·12 *l* 5·48	″ *h* 2·30 *h* 6·48 *h* 5·88 *h* 6·84 *h* 4·66	″ *h* 5·46 *h* 4·84	″ *l* 6·34 *l* 5·02	″ *l* 5·26 *l* 6·72 *h* 5·66 *h* 6·02	$M = 5''\cdot30$ $w = 16\cdot01$ $\frac{1}{w} = 0\cdot06$
	5·54	6·10	4·95	5·11	4·48	4·80	5·23	5·15	5·68	5·92	$C = 68° 53' 5''\cdot31$
XXXVIII (Gudali) and XXXIX (Ánĕpúdi)	*l* 61·54 *l* 61·72	*l* 60·68 *l* 62·52	*l* 62·00 *l* 60·50	*h* 60·08 *h* 59·22	*l* 62·08 *l* 62·60	*l* 59·84 *l* 62·60 *l* 61·18	*h* 61·86 *h* 59·58 *h* 61·82	*h* 60·66 *h* 61·00	*l* 60·30 *l* 62·80 *l* 62·18	*l* 62·04 *l* 59·50 *h* 63·14 *h* 62·94	$M = 61''\cdot33$ $w = 10\cdot78$ $\frac{1}{w} = 0\cdot09$
	61·63	61·60	61·25	59·65	62·34	61·21	61·09	60·83	61·76	61·91	$C = 55° 27' 1''\cdot35$
XXXIX (Ánĕpúdi) and XL (Pillimedu)	*l* 6·74 *l* 5·60	*l* 6·52 *l* 3·82 *l* 6·24	*l* 6·68 *l* 7·94	*h* 6·92 *h* 7·34	*l* 7·24 *l* 7·12	*l* 7·98 *l* 5·30 *l* 7·76	*l* 6·94 *h* 6·78	*h* 8·10 *h* 7·12	*l* 6·02 *l* 5·82 *l* 5·82	*l* 5·36 *l* 8·80 *h* 5·68 *h* 5·44	$M = 6''\cdot70$ $w = 12\cdot44$ $\frac{1}{w} = 0\cdot08$
	6·17	5·53	7·31	7·13	7·18	7·01	6·86	7·61	5·89	6·32	$C = 73° 58' 6''\cdot66$

At XXXVIII (Gudali)

January 1865; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIX (Ánĕpúdi) 157° 8′	337° 8′	236° 15′	56° 15′	315° 27′	135° 27′	34° 39′	214° 39′	113° 51′	293° 51′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXXIX (Ánĕpúdi) and XXXVII (Gurramkŏnda)	″ *l* 37·72 *l* 38·86	″ *l* 39·88 *l* 38·40	″ *l* 40·36 *l* 40·50	″ *l* 39·38 *l* 41·06	″ *l* 40·02 *l* 41·56	″ *l* 39·08 *l* 39·36	″ *l* 38·54 *l* 39·92	″ *l* 39·64 *l* 39·46	″ *l* 37·48 *l* 38·58	″ *l* 41·32 *l* 40·72	$M = 39''\cdot59$ $w = 8\cdot50$ $\frac{1}{w} = 0\cdot12$
	38·29	39·14	40·43	40·22	40·79	39·22	39·23	39·55	38·03	41·02	$C = 80° 38' 39''\cdot59$
XXXVII (Gurramkŏnda) and XXXIV (Bandalduru)	*l* 48·20 *l* 46·34	*l* 48·46 *l* 47·68	*l* 48·16 *l* 45·92 *l* 47·56	*l* 47·80 *l* 47·80	*l* 49·46 *l* 46·12 *l* 47·50 *l* 48·76	*l* 48·80 *l* 47·30	*l* 48·50 *l* 48·32	*l* 46·94 *l* 47·06	*l* 49·12 *l* 48·20	*l* 47·80 *l* 47·96	$M = 47''\cdot83$ $w = 18\cdot46$ $\frac{1}{w} = 0\cdot05$
	47·27	48·07	47·21	47·80	47·96	48·05	48·41	47·00	48·66	47·88	$C = 76° 23' 47''\cdot82$

At XXXIX (Ánĕpúdi)

February 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLII (Jonangipálĕm) 236° 49′	56° 49′	316° 1′	186° 1′	85° 13′	215° 13′	114° 25′	294° 24′	198° 37′	13° 36′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLII (Jonangipálĕm) and XLI (Kambákamdurgam)	″ l 62·44 l 62·38 d 62·13 d 63·25	″ l 62·36 l 59·34 l 62·24 l 62·12 d 62·76 d 63·80	″ h 62·20 h 63·14 d 62·12 d 61·86	″ h 61·70 h 62·56 d 63·17 d 63·25	″ l 60·98 l 63·58 l 61·52 l 63·28	″ l 60·18 l 61·90	″ l 61·28 l 62·80	″ l 61·64 l 64·32 h 60·86 h 62·66	″ h 63·06 h 65·46 l 62·00 l 60·52	″ h 63·54 h 62·24	$M = 62''·31$ $w = 16·05$ $\frac{1}{w} = 0·06$
	62·55	62·10	62·33	62·67	62·34	61·04	62·04	62·37	62·76	62·89	$C = 78° 40' 2''·34$
XLI (Kambákamdurgam) and XL (Pillimedu)	l 20·56 l 19·14 d 19·57 d 20·69	l 18·64 l 19·76 d 20·44 d 21·48	h 18·54 h 20·30 d 18·87 d 18·61	h 18·92 h 19·22 d 20·11 d 20·19	l 20·00 l 17·82 l 20·98 l 19·70	l 19·08 l 20·26	l 21·04 l 19·28	l 18·14 l 19·38 h 17·54	h 22·02 h 20·30	h 20·00 h 18·72	$M = 19''·71$ $w = 12·67$ $\frac{1}{w} = 0·08$
	19·99	20·08	19·08	19·61	19·63	19·67	20·16	18·35	21·16	19·36	$C = 71° 21' 19''·69$
XL (Pillimedu) and XXXVII (Gurramkŏnda)	l 21·72 l 20·86	l 18·64 l 19·16	l 19·20 l 20·48	l 21·78 l 19·32	l 20·58 l 24·00 l 20·46 l 19·20	l 20·48 l 19·72	l 18·32 l 21·52 l 22·40 h 17·32 h 21·60	l 22·72 l 19·90 h 20·94 h 19·12 h 20·70	h 20·36 h 20·40	h 19·70 h 21·14	$M = 20''·35$ $w = 9·17$ $\frac{1}{w} = 0·11$
	21·29	18·90	19·84	20·55	21·06	20·10	20·23	20·68	20·38	20·42	$C = 42° 52' 20''·39$
XXXVII (Gurramkŏnda) and XXXVIII (Gudali)	h 21·62 l 21·54 l 21·14	l 22·70 l 22·28	l 21·90 l 21·40	l 18·52 l 20·62 l 21·60	l 20·22 l 19·30	l 20·36 l 21·08	l 20·92 l 19·04	l 18·26 l 20·42 l 22·06 l 18·72	h 19·94 h 22·06 l 21·02	h 22·00 h 20·26	$M = 20''·83$ $w = 8·81$ $\frac{1}{w} = 0·11$
	21·43	22·49	21·65	20·25	19·76	20·72	19·98	19·87	21·01	21·13	$C = 43° 54' 20''·81$

At XL (Pillimedu)

February 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXVI (Kayyúr) 245° 37′	65° 37′	324° 49′	144° 49′	44° 1′	224° 1′	123° 13′	303° 13′	202° 25′	22° 25′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXVI (Kayyúr) and XXXVII (Gurramkŏnda)	″ h 44·46 h 44·92	″ l 43·88 l 44·18	″ h 42·38 h 43·42	″ h 45·08 h 44·18	″ h 43·34 h 43·54	″ h 42·48 l 42·54	″ l 44·00 l 43·18	″ l 43·80 l 43·12	″ h 45·26 h 44·76 l 43·16	″ h 44·32 l 43·90 l 43·80	$M = 43''·77$ $w = 16·26$ $\frac{1}{w} = 0·06$
	44·69	44·03	42·90	44·63	43·44	42·51	43·59	43·46	44·39	44·01	$C = 56° 26' 43''·77$

At XL (Pillimedu)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXVI (Kayyúr) 245° 37′	65° 37′	324° 49′	144° 49′	44° 1′	224° 1′	123° 13′	303° 13′	202° 25′	22° 25′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXVII (Gurramkŏnda) and XXXIX (Ánĕpúdi)	″ h 33·58 h 33·30	″ l 32·96 l 34·52	″ h 35·14 h 34·70	″ h 32·92 h 33·70	″ h 33·82 h 33·98	″ l 33·56 l 34·24	″ l 33·88 l 35·08	″ l 34·34 l 34·56	″ h 33·68 h 32·58	″ h 32·32 l 34·34	$M = 33''·86$ $w = 20·40$ $\frac{1}{w} = 0·05$
	33·44	33·74	34·92	33·31	33·90	33·90	34·48	34·45	33·13	33·33	$C = 63° \; 9' \; 33''·86$
XXXIX (Ánĕpúdi) and XLI (Kambákamdurgam)	h 1·74 h 2·70	h 2·60 h 2·54	h 2·28 h 2·56	h 2·68 h 2·80	h 2·22 h 1·84	h 0·88 l 1·94	l 3·64 l 0·80 l 1·84	l 2·84 l 0·64 l 0·20	h 1·72 h 2·54	h 2·20 l 3·66	$M = 2''·18$ $w = 18·90$ $\frac{1}{w} = 0·05$
	2·22	2·57	2·42	2·74	2·03	1·41	2·09	1·23	2·13	2·93	$C = 52° \; 44' \; 2''·16$
XLI (Kambákamdurgam) and XLIII (Yerpet)	h 47·00 h 47·38	h 46·90 h 45·76	h 45·78 h 45·92	h 46·78 h 45·34	h 47·34 h 47·08	h 47·88 l 46·78	l 45·42 l 46·18	l 44·40 l 46·50 l 47·24	l 45·74 l 45·54	l 45·94 l 46·52	$M = 46''·37$ $w = 17·40$ $\frac{1}{w} = 0·06$
	47·19	46·33	45·85	46·06	47·21	47·33	45·80	46·05	45·64	46·23	$C = 73° \; 15' \; 46''·37$

At XLI (Kambákamdurgam)

***March* 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XL (Pillimedu) 0° 1′	180° 1′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 37′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XL (Pillimedu) and XXXIX (Ánĕpúdi)	″ h 41·76 l 40·58 l 40·74 l 41·54 l 40·52	″ l 42·16 l 42·18 l 43·62 l 42·40	″ h 41·52 h 42·18 l 44·92 l 41·70	″ h 40·22 h 43·28 d 41·35	″ l 40·76 l 41·56 l 41·04	″ h 40·40 h 42·68 l 41·60 h 40·98	″ l 40·70 l 42·68	″ l 42·94 l 42·16 l 41·16	″ l 41·72 l 42·84 h 41·42	″ l 40·30 l 41·62	$M = 41''·71$ $w = 16·72$ $\frac{1}{w} = 0·06$
	41·03	42·59	42·58	41·62	41·12	41·42	41·69	42·09	41·99	40·96	$C = 55° \; 54' \; 41''·73$
XXXIX (Ánĕpúdi) and XLII (Jonangipálĕm)	l 49·84 l 49·50 l 49·48 d 50·41	l 51·08 l 50·72 l 48·94	l 49·24 l 48·16 d 49·03	h 49·40 h 50·34	l 49·08 l 49·98 l 49·32	l 50·94 h 50·02 d 50·32	l 50·68 l 49·40	l 49·90 l 48·90 l 49·32	l 50·50 l 48·76 d 49·13	l 50·12 l 49·90	$M = 49''·75$ $w = 29·30$ $\frac{1}{w} = 0·03$
	49·81	50·25	48·81	49·87	49·46	50·43	50·04	49·37	49·46	50·01	$C = 48° \; 58' \; 49''·74$

At XLI (Kambákamdurgam)—(*Continued*).

Angle between	Circle readings, telescope being set on XL (Pillimedu) 0° 1′	180° 1′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 37′	316° 48′	136° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XLII (Jonangipálĕm) and XLIV (Rĕttambedu)	l 51·32	l 53·78	l 52·34	h 52·02	l 54·42	l 50·48	l 50·62	l 50·38	l 51·60	l 52·50	$M = 52''\cdot19$
	l 52·82	l 51·56	l 51·76	h 51·44	l 52·54	h 50·26	l 51·04	l 53·06	l 52·62	l 52·28	$w = 12\cdot37$
	l 52·92	l 52·88	d 52·38		l 54·18	l 52·76		l 53·00	d 51·61		$\frac{1}{w} = 0\cdot08$
	d 53·15				l 53·72	l 53·28					
						d 51·54					
	52·55	52·74	52·16	51·73	53·72	51·66	50·83	52·15	51·94	52·39	$C = 37° 2' 52''\cdot21$
XLIV (Rĕttambedu) and XXXV (Chĕmbedu)	h 41·90	l 42·12	h 39·02	h 40·98	l 39·90	h 41·34	l 40·74	h 39·62	h 40·84	h 39·30	$M = 41''\cdot05$
	l 41·32	l 42·54	h 41·86	h 41·56	l 39·52	h 42·48	l 41·16	h 41·38	h 41·02	h 39·42	$w = 10\cdot79$
	l 39·98	l 41·90	l 39·44		l 40·64		l 41·16	l 40·92	h 41·90	h 39·00	$\frac{1}{w} = 0\cdot09$
			l 41·12		d 39·96		d 41·73	d 43·08	d 42·82	d 38·52	
					d 42·36			d 40·76		d 39·90	
	41·07	42·19	40·36	41·27	40·48	41·91	41·20	41·15	41·65	39·23	$C = 45° 27' 41''\cdot02$
XXXV (Chĕmbedu) and XXXIII (Nagari)	l 18·64	l 16·46	h 20·82	h 18·78	l 17·36	h 17·50	l 18·96	l 19·24	h 18·22	h 19·96	
	l 18·92	l 19·00	h 21·30	h 20·78	l 18·56	h 20·68	l 17·92	l 17·64	h 18·82	h 23·12	$M = 19''\cdot38$
	h 18·40	l 20·18	l 21·20		l 17·00	h 19·82	l 17·94	d 20·88	h 16·48	h 22·00	
	d 18·25	l 17·40	l 20·86		d 17·58	h 21·28	d 18·98	d 18·56	h 20·54	h 21·78	$w = 5\cdot75$
	d 18·45				d 19·98				d 20·09	d 21·00	
	d 18·59									d 22·38	$\frac{1}{w} = 0\cdot17$
	d 19·41										
	18·67	18·26	21·05	19·78	18·10	19·82	18·45	19·08	18·83	21·71	$C = 72° 56' 19''\cdot38$
XXXIII (Nagari) and XLIII (Yerpet)	l 26·64	l 28·14	h 23·98	h 25·88	l 24·46	h 26·60	l 25·68	l 25·22	l 25·54	l 26·50	
	l 26·80	l 25·48	h 20·46	h 24·58	l 27·16	h 25·18	l 24·50	l 25·22	l 24·82	l 24·76	$M = 25''\cdot74$
	h 26·68	l 28·36	l 25·94		l 26·10	l 27·14		l 25·10	h 27·88		
	d 26·31	l 29·28	l 24·66			h 25·62			h 24·46		$w = 6\cdot82$
	d 26·51		l 25·88								$\frac{1}{w} = 0\cdot15$
	d 26·65		l 22·92								
	d 27·47										
	26·72	27·82	23·97	25·23	25·91	26·13	25·09	25·18	25·68	25·63	$C = 62° 51' 25''\cdot77$
XLIII (Yerpet) and XL (Pillimedu)	h 10·16	l 6·72	h 9·20	h 10·32	l 10·92	h 9·54	l 12·24	l 9·70	l 9·42	l 9·84	
	l 12·64	l 7·16	h 11·82	h 8·58	l 9·88	h 10·70	l 10·58	l 10·72	l 9·74	l 8·60	
	l 12·48	l 8·48	l 6·68	d 9·05	l 9·50	l 7·42		l 12·18	h 10·42		
	l 10·36	l 8·52	l 11·30			h 9·88					$M = 10''\cdot15$
	l 10·86	l 10·60	l 10·46								$w = 8\cdot40$
		l 10·88	l 12·60								$\frac{1}{w} = 0\cdot12$
		l 11·02									
		l 12·12									
		l 11·32									
	11·30	9·65	10·34	9·32	10·10	9·39	11·41	10·87	9·86	9·22	$C = 36° 48' 10''\cdot14$

NOTE.—Stations XXXIII (Nagari) and XXXV (Chĕmbedu) appertain to the Madras Longitudinal Series.

At XLII (Jonangipálĕm)

March 1865; *observed by Captain B. R. Branfill with Troughton and Simms'* 24*-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIV (Rĕttambedu) 124° 31′	304° 31′	203° 44′	23° 44′	282° 56′	102° 56′	2° 8′	182° 7′	81° 19′	261° 19′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLIV (Rĕttambedu) and XLI (Kambákamdurgam)	″ l 48·06 l 48·00 l 51·64 h 51·68	″ l 49·50 l 50·30	″ l 50·80 l 49·44	″ l 48·82 l 49·22	″ l 51·22 l 52·20	″ l 50·22 l 50·68	″ l 49·20 l 50·30	″ l 51·12 l 49·06 l 50·74	″ l 49·68 l 51·14	″ l 50·90 l 50·98	$M = 50''·25$ $w = 10·79$ $\frac{1}{w} = 0·09$ $C = 72°\ 9'\ 50''·24$
	49·85	49·90	50·12	49·02	51·71	50·45	49·75	50·31	50·41	50·94	
XLI (Kambákamdurgam) and XXXIX (Ánĕpúdi)	l 10·98 l 12·16 l 10·84 h 10·98	l 9·94 l 8·78	l 9·80 l 9·86	l 10·24 l 10·50	l 9·76 l 9·40	l 10·48 l 10·86	l 10·66 l 10·40	l 10·10 l 10·52	l 9·80 l 10·06	l 10·90 l 9·50	$M = 10''·20$ $w = 25·90$ $\frac{1}{w} = 0·04$ $C = 52°\ 21'\ 10''·21$
	11·24	9·36	9·83	10·37	9·58	10·67	10·53	10·31	9·93	10·20	

At XLIII (Yerpet)

February 1865; *observed by Captain B. R. Branfill with Troughton and Simms'* 24*-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XL (Pillimedu) 129° 1′	309° 1′	208° 12′	28° 12′	287° 24′	107° 24′	6° 36′	186° 36′	85° 48′	265° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XL (Pillimedu) and XLI (Kambákamdurgam)	″ h 5·06 h 3·80	″ h 4·56 h 4·84	″ h 3·88 h 2·88	″ l 5·16 l 3·74	″ l 4·58 l 4·92	″ l 4·38 l 3·02	″ l 4·62 l 5·48	″ l 4·48 l 4·70	″ h 4·70 h 5·16	″ h 4·80 h 3·74	$M = 4''·43$ $w = 25·00$ $\frac{1}{w} = 0·04$ $C = 69°\ 56'\ 4''·43$
	4·43	4·70	3·38	4·45	4·75	3·70	5·05	4·59	4·93	4·27	
XLI (Kambákamdurgam) and XXXIII (Nagari)	h 36·34 h 37·36	h 36·10 h 34·62	h 34·46 h 36·96 h 35·26	l 35·52 l 37·50	l 37·02 l 36·36	l 34·86 l 36·12	l 35·74 l 35·24	l 35·64 l 36·84	h 35·54 h 35·70	h 36·44 h 37·40	$M = 36''·07$ $w = 16·13$ $\frac{1}{w} = 0·06$ $C = 59°\ 3'\ 36''·06$
	36·85	35·36	35·56	36·51	36·69	35·49	35·49	36·24	35·62	36·92	

NOTE.—Station XXXIII (Nagari) appertains to the Madras Longitudinal Series.

At XLIV (Rĕttambedu)

May 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXV (Chĕmbedu) 139° 20′	319° 20′	218° 32′	38° 32′	297° 44′	117° 44′	16° 55′	196° 55′	96° 8′	276° 8′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXV (Chĕmbedu) and XLI (Kambákamdurgam)	″ l 32·92 l 31·62 l 31·04 l 31·90	″ l 31·38 l 31·50 l 32·12	″ l 31·24 l 31·46 l 31·56	″ l 32·00 l 32·42 l 33·40	″ l 29·82 l 32·40 l 33·36 l 31·30	″ l 31·94 l 31·50 l 32·42 l 31·70	″ l 30·60 l 29·90 l 32·16	″ l 30·04 l 31·22 l 29·38 l 33·36 l 31·54	″ l 29·38 l 32·94 l 29·98 l 30·60	″ l 32·70 l 30·78 l 32·70	M = 31″·60 w = 17·19 1/w = 0·06
	31·87	31·67	31·42	32·61	31·72	31·89	30·89	31·11	30·73	32·06	C = 68° 31′ 31″·59
XLI (Kambákamdurgam) and XLII (Jonangipálĕm)	l 20·78 l 20·36 l 19·38	l 19·34 l 19·82 l 19·22	l 20·58 l 19·82 l 19·72	l 19·20 l 20·08 l 19·80	l 19·28 l 20·06 l 18·42 l 20·04	l 21·10 l 20·80 l 21·02 l 19·06	l 19·88 l 19·12 l 19·04	l 22·14 l 18·12 l 19·52 l 19·52 l 19·66	l 22·14 l 20·32 l 22·18 l 19·14	l 21·44 l 19·44 l 18·60	M = 19″·92 w = 20·86 1/w = 0·05
	20·17	19·46	20·04	19·69	19·45	20·50	19·35	19·79	20·94	19·83	C = 70° 47′ 19″·93

At XXXIII (Nagari)

March 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIII (Yerpet) 243° 13′	63° 13′	322° 25′	142° 25′	41° 37′	221° 37′	120° 50′	300° 49′	200° 1′	20° 1′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLIII (Yerpet) and XLI (Kambákamdurgam)	″ h 57·94 h 60·22 h 59·38	″ h 58·86 h 59·98 h 60·10	″ l 58·66 l 59·28 l 59·80	″ l 59·46 l 58·06 l 57·30	″ l 55·92 l 55·60 l 58·74 l 58·96 h 60·94 h 60·80	″ l 59·40 l 59·10 h 58·74	″ l 62·18 l 56·80 l 59·04 l 60·68 l 57·92	″ l 59·58 l 56·60 l 60·18 h 59·88	″ h 58·76 h 58·48 l 58·72 d 58·73	″ l 58·92 h 59·90 h 58·30	M = 59″·00 w = 15·57 1/w = 0·06
	59·18	59·65	59·25	58·27	58·49	59·08	59·32	59·06	58·67	59·04	C = 58° 4′ 58″·98
XLI (Kambákamdurgam) and XXXV (Chĕmbedu)	h 30·68 h 30·60 h 30·78	h 31·42 h 29·40 h 32·30	l 33·74 l 34·22 l 31·94	l 31·54 l 32·44 l 33·50	l 36·66 l 36·28 l 34·60 l 32·94 h 27·20 h 27·98	l 31·06 l 31·54 h 29·42	l 29·94 l 34·56 l 34·30 l 32·98 l 33·88	l 32·54 l 33·22 h 28·36 h 30·82	h 31·74 h 31·28 h 30·36 d 31·21	h 28·82 h 30·26 h 30·28	M = 31″·61 w = 4·19 1/w = 0·24
	30·69	31·04	33·30	32·49	32·61	30·67	33·13	31·24	31·15	29·79	C = 54° 55′ 31″·66

Note.—Stations XXXIII (Nagari) and XXXV (Chĕmbedu) appertain to the Madras Longitudinal Series.

At XXXV (Chĕmbedu)

May 1865; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIII (Nagari)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	118° 10′	298° 10′	197° 22′	17° 22′	276° 34′	96° 34′	355° 46′	175° 46′	74° 58′	254° 57′	
XXXIII (Nagari) and XLI (Kambákamdurgam)	″ l 12·76 l 15·98 l 16·02 l 15·00	″ l 13·94 l 14·74 l 15·12	″ l 14·80 l 14·14 l 13·36	″ l 14·58 l 14·28 l 15·14	″ l 12·40 l 13·94 l 14·00	″ l 12·36 l 15·26 l 14·02	″ l 13·44 l 14·32 l 13·44	″ l 13·68 h 15·84 l 14·52	″ l 12·68 l 11·96 l 15·28 l 13·78	″ l 15·22 l 15·36 l 14·86	$M = 14''\cdot26$ $w = 15\cdot70$ $\frac{1}{w} = 0\cdot06$ $C = 52^\circ\ 8'\ 14''\cdot26$
	14·94	14·60	14·10	14·67	13·45	13·88	13·73	14·68	13·43	15·15	
XLI (Kambákamdurgam) and XLIV (Rĕttambedu)	l 50·84 l 49·72 l 49·02 l 49·78	l 49·92 l 48·76 l 49·18	l 49·78 l 50·14 l 50·48	l 50·34 h 51·40 h 49·78	l 51·34 l 50·74 l 49·60	l 49·50 l 49·72 l 49·84 l 50·04	l 48·80 l 49·64 l 51·86	l 50·32 h 49·18 l 48·96	l 48·42 l 50·10 l 48·80	l 50·12 l 48·42 l 49·54	$M = 49''\cdot82$ $w = 24\cdot30$ $\frac{1}{w} = 0\cdot04$ $C = 66^\circ\ 0'\ 49''\cdot82$
	49·84	49·29	50·13	50·51	50·56	49·78	50·10	49·49	49·11	49·36	

At XXXIX (Dhár)

December 1860; *and January* 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XLI (Sánjib)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	213° 38′	33° 38′	292° 50′	112° 50′	12° 8′	192° 8′	91° 15′	271° 15′	170° 27′	350° 27′	
XLI (Sánjib) and XLV (Gundálamma)	″ l 26·80 l 26·82	″ l 26·00 l 25·98	″ h 28·16 h 27·54	″ h 28·38 h 27·48	″ h 29·18 h 27·42 l 28·12	″ l 27·12 l 27·18	″ l 27·98 l 27·54	″ l 24·98 l 26·58	″ l 29·76 l 29·06	″ l 29·68 l 29·54	$M = 27''\cdot65$ $w = 5\cdot81$ $\frac{1}{w} = 0\cdot17$ $C = 79^\circ\ 11'\ 27''\cdot65$
	26·81	25·99	27·85	27·93	28·24	27·15	27·76	25·78	29·41	29·61	
XLV (Gundálamma) and XLVII (Pagulráyi)	l 10·06 l 9·48	l 10·42 l 10·86	h 10·78 h 9·22	h 10·04 h 10·28	h 7·62 l 7·54	l 6·18 l 7·16	l 9·52 l 9·50	l 11·02 l 9·90	l 8·44 l 9·70	l 11·22 l 10·66	$M = 9''\cdot48$ $w = 5\cdot10$ $\frac{1}{w} = 0\cdot20$ $C = 67^\circ\ 11'\ 9''\cdot48$
	9·77	10·64	10·00	10·16	7·58	6·67	9·51	10·46	9·07	10·94	

Note.—Stations XXXIII (Nagari) and XXXV (Chĕmbedu) appertain to the Madras Longitudinal Series, and XXXIX (Dhár) and XLI (Sánjib) to the Bider Longitudinal Series of the South-East Quadrilateral.

At XLI (Sánjib)

December 1860; *observed by Lieutenant J. P. Basevi, R.E., and Mr. R. Clarkson with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XLVI (Kappakŏnda) 0° 2′	180° 2′	79° 13′	259° 13′	158° 26′	338° 26′	237° 37′	57° 38′	316° 48′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVI (Kappakŏnda) and XLV (Gundálamma)	″ l 14·34 l 14·58	″ l 12·34 l 12·08 h 15·00 h 15·42	″ h 17·08 h 16·72 l 15·54	″ h 14·48 h 16·44	″ l 15·60 l 17·64 l 18·08	″ l 18·38 l 15·46 h 16·60	″ h 17·54 h 15·54 h 15·92	″ h 15·80 h 18·44 h 17·68	″ l 12·90 l 14·68	″ l 14·20 l 14·38	$M = 15''\cdot57$ $w = 4\cdot19$ $\frac{1}{w} = 0\cdot24$
	14·46	13·71	16·45	15·46	17·11	16·81	16·33	17·31	13·79	14·29	$C = 42° 45' 15''\cdot60$
XLV (Gundálamma) and XXXIX (Dhár)	l 35·66 l 36·08	l 36·60 l 37·98	h 37·10 h 36·54	h 35·70 h 35·88	l 37·54 l 35·68 l 35·98	l 35·66 l 34·38 h 34·46	h 34·52 h 36·44	h 36·84 h 35·42	l 36·92 l 37·58	l 37·00 l 36·00	$M = 36''\cdot24$ $w = 12\cdot74$ $\frac{1}{w} = 0\cdot08$
	35·87	37·29	36·82	35·79	36·40	34·83	35·48	36·13	37·25	36·50	$C = 45° 11' 36''\cdot23$

At XLV (Gundálamma)

January 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XLVII (Pagulráyi) 0° 1′	180° 0′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLVII (Pagulráyi) and XXXIX (Dhár)	″ h 59·32 l 58·82	″ l 56·22 l 58·84 l 55·18	″ l 58·66 l 57·86	″ h 58·60 h 59·28	″ h 60·86 h 59·74 h 59·62	″ l 59·52 l 59·56	″ l 60·60 l 61·72	″ l 60·36 l 59·38	″ h 58·26 h 58·76	″ h 59·38 h 56·02 h 57·52 d 57·70	$M = 58''\cdot98$ $w = 5\cdot21$ $\frac{1}{w} = 0\cdot19$
	59·07	56·75	58·26	58·94	60·07	59·54	61·16	59·87	58·51	57·66	$C = 49° 38' 58''\cdot96$
XXXIX (Dhár) and XLI (Sánjib)	h 57·16 l 56·84	l 58·04 l 57·54 l 58·88	l 56·82 l 58·52	l 56·44 l 55·94 d 56·91	h 55·58 h 57·10 h 56·24	l 57·12 l 57·26	l 57·68 l 57·28	l 57·30 l 55·56 l 58·36	l 60·04 l 59·20	l 58·36 l 58·18 d 58·33	$M = 57''\cdot52$ $w = 9\cdot05$ $\frac{1}{w} = 0\cdot11$
	57·00	58·15	57·67	56·43	56·31	57·19	57·48	57·07	59·62	58·29	$C = 55° 36' 57''\cdot51$
XLI (Sánjib) and XLVI (Kappakŏnda)	h 61·06 h 59·78	h 60·28 l 60·56	l 61·06 l 60·70	l 60·14 l 62·50 l 61·74	l 59·48 l 59·88	l 59·00 l 59·12	l 59·78 l 59·70	l 61·06 l 63·20 l 59·24 l 58·70	h 61·20 h 61·40	h 60·54 h 61·52	$M = 60''\cdot45$ $w = 10\cdot71$ $\frac{1}{w} = 0\cdot09$
	60·42	60·42	60·88	61·46	59·68	59·06	59·74	60·55	61·30	61·03	$C = 51° 46' 0''\cdot47$

NOTE.—Stations XXXIX (Dhár) and XLI (Sánjib) appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

At XLV (Gundálamma)—(*Continued*).

Angle between	Circle readings, telescope being set on XLVII (Pagulráyi) 0°1′	180°0′	79°13′	259°13′	158°25′	338°25′	237°37′	57°37′	316°49′	136°49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLVI (Kappakŏnda) and XLVIII (Nágal)	″ h 23·84 h 23·50	″ h 23·10 l 23·20	″ l 26·00 l 23·72 l 24·70	″ h 22·56 h 26·20 l 23·64	″ l 23·44 l 24·02	″ l 23·34 l 23·50	″ l 22·68 l 24·08	″ l 24·74 l 22·84 l 24·56	″ h 23·02 h 24·36	″ h 23·30 h 21·94	$M = 23''\cdot67$ $w = 15\cdot40$ $\frac{1}{w} = 0\cdot06$
	23·67	23·15	24·81	24·13	23·73	23·42	23·38	24·05	23·69	22·62	$C = 77^\circ\ 36'\ 23''\cdot71$
XLVIII (Nágal) and XLIX (Kalimámidi)	h 40·54 h 40·44	h 38·22 l 39·24	l 38·76 l 37·94 l 37·10	h 37·60 h 36·62	l 37·34 l 39·76 l 38·38	l 38·88 h 37·26	l 38·80 l 38·62 d 38·77	l 37·28 l 35·78 l 37·86	h 37·60 h 38·04	h 40·72 h 40·08	$M = 38''\cdot47$ $w = 6\cdot32$ $\frac{1}{w} = 0\cdot16$
	40·49	38·73	37·93	37·11	38·49	38·07	38·73	36·97	37·82	40·40	$C = 65^\circ\ 24'\ 38''\cdot46$
XLIX (Kalimámidi) and XLVII (Pagulráyi)	h 60·08 h 59·24	h 61·88 l 59·84 l 62·28	l 58·96 l 61·46 l 60·94	h 60·82 h 61·50	l 59·92 l 60·24	l 61·58 h 59·48 h 59·58	l 57·78 l 58·16 h 57·48	l 59·36 h 60·12	h 61·84 h 61·44	h 61·84 h 62·20 h 61·98	$M = 60''\cdot41$ $w = 5\cdot92$ $\frac{1}{w} = 0\cdot17$
	59·66	61·33	60·45	61·16	60·08	60·21	57·81	59·74	61·64	62·01	$C = 59^\circ\ 57'\ 0''\cdot41$

At XLVI (Kappakŏnda)

January 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24*-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XLVIII (Nágal) 226°59′	46°59′	306°11′	126°11′	25°23′	205°23′	104°36′	284°36′	183°47′	3°48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLVIII (Nágal) and XLV (Gundálamma)	″ h 45·22 h 46·66	″ h 46·66 h 45·98	″ h 47·22 h 47·70	″ h 46·72 h 47·34	″ h 47·54 h 47·42	″ l 48·32 l 49·62 h 49·76	″ h 47·50 h 48·78	″ h 48·52 h 47·82	″ h 46·00 h 46·24	″ h 48·00 h 48·38	$M = 47''\cdot41$ $w = 8\cdot12$ $\frac{1}{w} = 0\cdot12$
	45·94	46·32	47·46	47·03	47·48	49·23	48·14	48·17	46·12	48·19	$C = 47^\circ\ 32'\ 47''\cdot41$
XLV (Gundálamma) and XLI (Sánjib)	h 46·50 h 46·86	h 46·46 h 47·58	h 44·74 h 43·66	h 44·64 h 45·08	h 42·64 h 43·02	l 44·02 h 42·36 l 43·06	h 44·72 h 43·86	h 45·92 h 44·70	h 48·86 h 47·56 h 46·90	h 46·26 h 44·94	$M = 45''\cdot17$ $w = 3\cdot52$ $\frac{1}{w} = 0\cdot28$
	46·68	47·02	44·20	44·86	42·83	43·15	44·29	45·31	47·77	45·60	$C = 85^\circ\ 28'\ 45''\cdot17$

Note.—Station XLI (Sánjib) appertains to the Bider Longitudinal Series of the South-East Quadrilateral.

At XLVII (Pagulráyi)

January 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XXXIX (Dhár) 248° 31′	68° 31′	327° 43′	147° 43′	46° 55′	226° 55′	126° 7′	306° 7′	205° 19′	25° 19′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXIX (Dhár) and XLV (Gundálamma)	″ h 55·50 h 54·86	″ l 55·10 l 55·38	″ l 53·46 l 54·18	″ l 53·16 l 53·34	″ l 53·48 l 52·48	″ l 53·34 l 53·78	″ l 54·96 l 55·40	″ l 54·32 l 53·94	″ h 52·90 h 53·10	″ h 50·52 h 50·56	$M = 53''\cdot69$ $w = 4\cdot90$ $\frac{1}{w} = 0\cdot20$
	55·18	55·24	53·82	53·25	52·98	53·56	55·18	54·13	53·00	50·54	$C = 63° 9' 53''\cdot69$
XLV (Gundálamma) and XLIX (Kalimámidi)	h 9·40 h 8·90	l 11·04 l 10·74	l 8·08 l 7·02	l 10·08 l 8·98	l 7·78 l 8·14	l 8·40 l 9·34	l 6·52 l 6·88 h 8·86 h 7·34	l 8·04 l 8·14	h 11·82 h 10·90	h 11·82 h 11·42	$M = 9''\cdot24$ $w = 4\cdot01$ $\frac{1}{w} = 0\cdot25$
	9·15	10·89	7·55	9·53	7·96	8·87	7·40	8·09	11·36	11·62	$C = 48° 20' 9''\cdot24$

At XLVIII (Nágal)

January 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on LI (Elangoi) 105° 28′	285° 28′	184° 39′	4° 39′	263° 52′	83° 52′	343° 4′	163° 4′	62° 16′	242° 16′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LI (Elangoi) and L (Nallakŏnda)	″ h 39·38 h 39·66	″ h 42·16 h 40·70 h 39·18	″ h 39·34 h 39·40	″ h 37·96 h 39·18	″ h 39·70 h 39·90	″ h 40·02 h 38·70	″ l 38·18 l 38·68	″ l 37·12 l 38·48	″ h 38·20 h 36·86	″ l 35·16 l 36·40 l 35·98	$M = 38''\cdot69$ $w = 4\cdot74$ $\frac{1}{w} = 0\cdot21$
	39·52	40·68	39·37	38·57	39·80	39·36	38·43	37·80	37·53	35·85	$C = 56° 7' 38''\cdot69$
L (Nallakŏnda) and XLIX (Kalimámidi)	h 8·28 h 6·92 h 7·64	h 7·18 h 8·26 l 7·72	h 4·24 h 3·62	h 4·82 h 5·00	h 4·14 h 3·94	h 5·22 h 4·76	l 3·40 l 3·36	l 4·42 l 3·36	h 5·76 h 5·40	l 7·30 l 7·80	$M = 5''\cdot36$ $w = 3\cdot42$ $\frac{1}{w} = 0\cdot29$
	7·61	7·72	3·93	4·91	4·04	4·99	3·38	3·89	5·58	7·55	$C = 88° 19' 5''\cdot37$
XLIX (Kalimámidi) and XLV (Gundálamma)	l 23·86 l 24·74	l 25·84 l 24·62	l 26·50 l 26·38	l 25·22 l 23·42	h 25·88 h 25·60	h 23·96 h 26·04 h 25·28	l 26·72 l 26·06	l 25·74 l 27·74 l 27·26	h 23·22 h 26·04 l 26·56	h 24·42 h 24·74	$M = 25''\cdot43$ $w = 8\cdot77$ $\frac{1}{w} = 0\cdot11$
	24·30	25·23	26·44	24·32	25·74	25·09	26·39	26·91	25·27	24·58	$C = 55° 15' 25''\cdot44$

NOTE.—Station XXXIX (Dhár) appertains to the Bider Longitudinal Series of the South-East Quadrilateral.

At XLVIII (Nágal)—(*Continued*).

Angle between	Circle readings, telescope being set on LI (Elangoi) 105° 28′	285° 28′	184° 39′	4° 39′	263° 52′	83° 52′	343° 4′	163° 4′	62° 16′	242° 16′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XLV (Gundálamma) and XLVI (Kappakŏnda)	″ *l* 51·86 *l* 50·72	″ *l* 52·28 *l* 52·58	″ *l* 50·58 *l* 50·76	″ *l* 52·62 *l* 53·48	″ *h* 48·34 *h* 49·30	″ *h* 49·70 *h* 47·86	″ *l* 50·38 *l* 52·72 *l* 50·50	″ *l* 52·48 *l* 50·52 *l* 50·02	″ *h* 52·12 *h* 50·40 *l* 50·44	″ *h* 52·38 *h* 52·32	$M = 51''·06$ $w = 4·46$ $\frac{1}{w} = 0·22$
	51·29	52·43	50·67	53·05	48·82	48·78	51·20	51·01	50·99	52·35	$C = 54° 50' 51''·06$

At XLIX (Kalimámidi)

February 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XLVII (Pagulráyi) 183° 35′	3° 35′	262° 48′	82° 48′	342° 0′	162° 0′	61° 11′	241° 11′	140° 24′	320° 24′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XLVII (Pagulráyi) and XLV (Gundálamma)	″ *h* 49·84 *h* 48·92	″ *h* 52·06 *h* 51·10	″ *h* 50·00 *h* 49·54	″ *l* 50·08 *l* 47·80 *l* 49·58	″ *l* 50·54 *l* 51·14	″ *l* 49·48 *l* 48·70	″ *l* 52·44 *l* 52·94	″ *l* 51·98 *l* 51·96	″ *h* 50·08 *h* 52·50 *h* 50·08	″ *h* 52·08 *h* 52·42	$M = 50''·76$ $w = 5·02$ $\frac{1}{w} = 0·20$
	49·38	51·58	49·77	49·15	50·84	49·09	52·69	51·97	50·89	52·25	$C = 71° 42' 50''·76$
XLV (Gundálamma) and XLVIII (Nágal)	*h* 59·18 *h* 59·64	*h* 60·84 *h* 60·50	*h* 59·12 *h* 60·26	*l* 59·84 *l* 60·00	*l* 57·90 *l* 58·08	*l* 59·30 *l* 59·60	*l* 56·24 *l* 56·70	*l* 58·08 *l* 57·60	*l* 57·42 *l* 57·74	*l* 57·08 *l* 57·28	$M = 58''·62$ $w = 5·20$ $\frac{1}{w} = 0·19$
	59·41	60·67	59·69	59·92	57·99	59·45	56·47	57·84	57·58	57·18	$C = 59° 19' 58''·62$
XLVIII (Nágal) and L (Nallakŏnda)	*h* 20·94 *h* 18·38 *h* 19·10	*h* 20·26 *h* 18·60	*h* 15·72 *h* 15·10 *l* 17·10	*l* 17·18 *l* 18·04	*l* 16·24 *l* 16·58	*l* 16·00 *l* 16·10	*l* 16·80 *l* 16·58	*l* 16·52 *l* 16·10	*l* 19·26 *l* 19·88	*l* 19·92 *l* 19·42	$M = 17''·72$ $w = 3·52$ $\frac{1}{w} = 0·28$
	19·47	19·43	15·97	17·61	16·41	16·05	16·69	16·31	19·57	19·67	$C = 45° 22' 17''·72$
L (Nallakŏnda) and LII (Kappa)	*h* 25·48 *h* 24·12	*l* 23·48 *l* 22·54	*l* 23·82 *l* 24·68	*l* 23·56 *l* 23·80	*l* 24·48 *l* 24·88	*l* 25·46 *l* 25·28	*l* 23·68 *l* 23·90	*l* 23·34 *l* 23·12	*l* 22·78 *l* 23·78	*l* 23·50 *l* 23·54	$M = 23''·96$ $w = 14·70$ $\frac{1}{w} = 0·07$
	24·80	23·01	24·25	23·68	24·68	25·37	23·79	23·23	23·28	23·52	$C = 43° 45' 23''·96$

At L (Nallakŏnda)

February 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's 24-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XLVIII (Nágal) 0° 1′	180° 1′	79° 12′	259° 12′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLVIII (Nágal) and LI (Elangoi)	″ h 54·00 h 52·80	″ l 51·70 l 53·00	″ h 53·74 h 54·00	″ h 52·02 h 52·54	″ h 56·04 h 56·82	″ h 53·10 h 55·28 h 53·30	″ h 54·90 h 55·58	″ h 53·18 h 54·66	″ h 53·22 h 53·04	″ l 51·06 l 51·74	$M = 53''\cdot59$ $w = 4\cdot31$ $\frac{1}{w} = 0\cdot23$
	53·40	52·35	53·87	52·28	56·43	53·89	55·24	53·92	53·13	51·40	$C = 80^\circ\ 15'\ 53''\cdot59$
LI (Elangoi) and LIII (Náwilmĕtta)	h 30·44 h 31·24	l 29·18 l 29·60	h 30·26 h 33·20 h 31·72	h 31·80 h 30·86	h 31·14 h 28·12 h 29·38	h 29·14 h 27·58 h 27·92	h 31·44 h 30·00	h 28·10 h 27·98	h 28·16 h 30·16 h 28·62	h 30·82 h 29·66	$M = 29''\cdot90$ $w = 5\cdot22$ $\frac{1}{w} = 0\cdot19$
	30·84	29·39	31·73	31·33	29·55	28·21	30·72	28·04	28·98	30·24	$C = 41^\circ\ 29'\ 29''\cdot89$
LIII (Náwilmĕtta) and LIV (Pothkŏnda)	h 59·08 h 58·14	l 59·64 l 59·90	h 60·72 h 57·56 h 60·50	h 59·92 h 59·28	h 59·02 h 59·10	l 60·30 l 60·50	h 60·26 h 61·92	h 62·24 l 60·44	h 60·98 h 60·30	h 59·12 h 60·18	$M = 59''\cdot98$ $w = 9\cdot79$ $\frac{1}{w} = 0\cdot10$
	58·61	59·77	59·59	59·60	59·06	60·40	61·09	61·34	60·64	59·65	$C = 60^\circ\ 34'\ 59''\cdot98$
LIV (Pothkŏnda) and LII (Kappa)	l 62·18 l 62·70	l 63·94 l 63·04	h 61·30 h 63·06	h 61·36 h 64·48 h 64·06	h 61·10 h 62·64	l 59·72 l 59·80	h 60·86 h 60·32	h 61·46 l 63·38	h 64·82 h 62·72 h 62·04	h 63·92 l 62·76	$M = 62''\cdot26$ $w = 5\cdot28$ $\frac{1}{w} = 0\cdot19$
	62·44	63·49	62·18	63·30	61·87	59·76	60·59	62·42	63·19	63·34	$C = 76^\circ\ 53'\ 2''\cdot27$
LII (Kappa) and XLIX (Kalimámidi)	l 55·28 l 56·60	l 53·74 l 54·38	h 58·68 h 57·14	h 57·06 h 57·64 h 56·84	h 56·66 h 55·48	l 56·92 l 57·94	h 56·92 h 56·52	h 55·58 h 55·10	h 54·20 h 55·86	h 54·18 h 53·76 d 54·32	$M = 55''\cdot98$ $w = 5\cdot12$ $\frac{1}{w} = 0\cdot20$
	55·94	54·06	57·91	57·18	56·07	57·43	56·72	55·34	55·03	54·09	$C = 54^\circ\ 27'\ 55''\cdot98$
XLIX (Kalimámidi) and XLVIII (Nágal)	h 36·46 h 38·48 l 38·42	l 41·84 l 40·96	h 35·92 h 35·76	h 35·90 h 37·08	h 37·40 h 37·74	h 37·76 h 37·94	h 36·54 h 35·66	h 37·14 h 37·46	h 37·94 h 40·80 h 39·06	h 39·36 h 40·20 d 40·13	$M = 37''\cdot95$ $w = 3\cdot03$ $\frac{1}{w} = 0\cdot33$
	37·79	41·40	35·84	36·49	37·57	37·85	36·10	37·30	39·27	39·90	$C = 46^\circ\ 18'\ 37''\cdot96$

At LI (Elangoi)

March 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on LIII (Náwilmĕtta) 249° 24′	69° 24′	328° 36′	148° 36′	47° 48′	227° 48′	127° 0′	307° 0′	206° 12′	26° 12′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LIII (Náwilmĕtta) and L (Nallakŏnda)	″ l 18·88 l 19·22	″ l 20·44 l 19·68	″ l 18·70 l 20·14	″ l 18·76 l 18·52	″ l 20·06 l 19·66	″ l 19·06 l 19·12	″ l 19·60 l 19·80	″ h 20·28 h 20·34	″ l 17·18 l 18·66 l 18·14	″ l 18·30 l 19·12	$M = 19''\cdot28$ $w = 16\cdot78$ $\frac{1}{w} = 0\cdot06$
	19·05	20·06	19·42	18·64	19·86	19·09	19·70	20·31	17·99	18·71	$C = 67^\circ\ 0'\ 19''\cdot27$
L (Nallakŏnda) and XLVIII (Nágal)	h 29·68 h 31·26	h 31·18 l 31·68	l 30·06 l 29·10	l 31·34 l 31·98	l 27·38 l 28·36	l 29·34 l 29·88	l 28·60 l 29·44	h 26·60 h 28·68 h 29·32	h 29·94 l 30·70	l 30·38 l 30·46	$M = 29''\cdot86$ $w = 5\cdot72$ $\frac{1}{w} = 0\cdot17$
	30·47	31·43	29·58	31·66	27·87	29·61	29·02	28·20	30·32	30·42	$C = 43^\circ\ 36'\ 29''\cdot85$

At LII (Kappa)

February 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on XLIX (Kalimámidi) 229° 7′	49° 8′	308° 20′	128° 20′	27° 32′	207° 32′	106° 44′	286° 44′	185° 56′	5° 56′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLIX (Kalimámidi) and L (Nallakŏnda)	″ h 44·36 h 44·32	″ l 45·50 l 44·64	″ l 44·46 l 43·90	″ l 44·02 l 43·46	″ l 44·74 l 43·94	″ l 41·34 l 42·82	″ l 40·70 l 39·36	″ l 39·82 l 41·80 h 40·42	″ h 40·68 h 40·84	″ h 40·96 h 41·80	$M = 42''\cdot66$ $w = 2\cdot80$ $\frac{1}{w} = 0\cdot36$
	44·34	45·07	44·18	43·74	44·34	42·08	40·03	40·68	40·76	41·38	$C = 81^\circ\ 46'\ 42''\cdot66$
L (Nallakŏnda) and LIV (Pothkŏnda)	h 49·04 h 47·46 h 47·40	h 49·62 h 46·98 h 47·54	l 48·56 l 47·42	l 49·72 l 49·68	l 46·52 l 47·04	l 48·62 l 48·06	l 50·58 l 49·26	l 49·68 l 49·48	h 48·70 h 49·24	h 48·64 h 49·84	$M = 48''\cdot65$ $w = 8\cdot50$ $\frac{1}{w} = 0\cdot12$
	47·97	48·05	47·99	49·70	46·78	48·34	49·92	49·58	48·97	49·24	$C = 49^\circ\ 6'\ 48''\cdot64$

At LIII (Náwilmĕtta)

March 1861; *observed by Captain J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on LV (Lachmipuram)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	170° 36′	350° 35′	249° 47′	69° 47′	329° 0′	149° 0′	48° 12′	228° 12′	127° 24′	307° 24′	
LV (Lachmipuram) and LVI (Adakŏnda)	″ h 60·96 l 59·36	″ l 61·24 l 60·38	″ l 61·88 l 62·36	″ l 62·82 l 61·86	″ h 61·88 h 60·24 h 61·24	″ h 60·20 h 61·20	″ h 60·34 h 60·92	″ l 60·42 l 60·06	″ h 62·14 h 61·68	″ h 63·02 h 63·86	$M = 61''·35$ $w = 8·03$ $\frac{1}{w} = 0·12$
	60·16	60·81	62·12	62·34	61·12	60·70	60·63	60·24	61·91	63·44	$C = 35° 51′ 1''·35$
LVI (Adakŏnda) and LIV (Pothkŏnda)	h 43·42 h 42·44	l 40·64 l 41·72	h 42·74 l 41·90	l 41·02 l 42·44	h 42·18 h 42·50	h 41·60 h 41·96	h 42·60 h 40·92	l 42·76 l 42·72	h 41·92 h 41·78	h 42·46 h 42·88	$M = 42''·13$ $w = 23·80$ $\frac{1}{w} = 0·04$
	42·93	41·18	42·32	41·73	42·34	41·78	41·76	42·74	41·85	42·67	$C = 34° 0′ 42''·13$
LIV (Pothkŏnda) and L (Nallakŏnda)	h 60·62 h 60·14	l 61·36 l 61·38	l 58·88 l 58·64	h 59·90 h 60·70	l 60·56 l 61·24	l 61·72 l 60·92	l 61·72 l 61·24	l 59·84 l 60·62	l 59·42 l 60·60	l 61·50 l 60·08	$M = 60''·55$ $w = 13·30$ $\frac{1}{w} = 0·08$
	60·38	61·37	58·76	60·30	60·90	61·32	61·48	60·23	60·01	60·79	$C = 48° 3′ 0''·55$
L (Nallakŏnda) and LI (Elangoi)	h 12·84 h 12·46	l 13·68 l 13·18	l 12·50 l 11·72	h 13·60 h 12·52	l 9·86 l 9·98	l 9·74 l 10·64	l 11·50 l 10·86	l 10·72 l 10·96	l 13·98 l 13·78	l 13·40 l 13·42	$M = 12''·07$ $w = 4·70$ $\frac{1}{w} = 0·21$
	12·65	13·43	12·11	13·06	9·92	10·19	11·18	10·84	13·88	13·41	$C = 71° 30′ 12''·07$

At LIV (Pothkŏnda)

February and March 1861; *observed by Lieutenant J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on LII (Kappa)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	121° 39′	301° 39′	200° 51′	20° 51′	280° 3′	100° 3′	359° 15′	179° 15′	78° 28′	258° 28′	
LII (Kappa) and L (Nallakŏnda)	″ h 7·94 h 7·62	″ h 10·96 h 11·40	″ l 10·50 l 11·22	″ l 9·32 l 9·78	″ l 9·32 l 9·48	″ l 9·76 l 9·50	″ h 9·60 h 8·56	″ h 10·32 h 10·24	″ l 9·28 l 9·62	″ l 10·34 l 9·88	$M = 9''·73$ $w = 10·40$ $\frac{1}{w} = 0·10$
	7·78	11·18	10·86	9·55	9·40	9·63	9·08	10·28	9·45	10·11	$C = 54° 0′ 9''·73$

At LIV (Pothkŏnda)—(*Continued*).

Angle between	Circle readings, telescope being set on LII (Kappa)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	121° 39′	301° 39′	200° 51′	20° 51′	280° 3′	100° 3′	359° 15′	179° 15′	78° 28′	258° 28′	
L (Nallakŏnda) and LIII (Náwilmĕtta)	″ h 60·24 h 61·90	″ h 60·26 h 60·40	″ h 60·06 l 60·42	″ l 59·90 l 58·74	″ l 61·10 l 60·38	″ l 57·86 l 58·52	″ h 59·74 h 60·90	″ h 59·12 h 59·02	″ l 62·38 l 62·42	″ l 61·44 l 61·76	$M = 60''·33$ $w = 6·20$ $\frac{1}{w} = 0·16$
	61·07	60·33	60·24	59·32	60·74	58·19	60·32	59·07	62·40	61·60	$C = 71° 22' 0''·33$
LIII (Náwilmĕtta) and LV (Lachmipuram)	h 20·28 h 18·36	h 20·74 h 19·22	h 19·52 l 20·48	l 21·52 l 22·48	l 20·08 h 21·74	l 21·70 l 21·24	l 20·56 h 21·28	l 19·24 l 20·24	l 19·04 l 18·38 d 19·13	l 16·42 l 18·64 l 16·40	$M = 20''·03$ $w = 4·54$ $\frac{1}{w} = 0·22$
	19·32	19·98	20·00	22·00	20·91	21·47	20·92	19·74	18·85	17·15	$C = 61° 38' 20''·01$
LV (Lachmipuram) and LVI (Adakŏnda)	h 49·46 h 49·46	h 49·04 h 48·84	h 48·52 l 47·12	l 47·52 h 48·66	l 47·48 l 49·06	l 48·54 l 47·84	l 47·86 h 49.02	l 49·18 l 49·98	l 50·48 l 51·50 d 51·41	l 53·58 l 50·12 l 51·76	$M = 49''·17$ $w = 4·84$ $\frac{1}{w} = 0·21$
	49·46	48·94	47·82	48·09	48·27	48·19	48·44	49·58	51·13	51·82	$C = 51° 20' 49''·19$

At LV (Lachmipuram)

May 1861; *observed by Captain J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on LVIII (Aupád)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	156° 37′	336° 37′	235° 48′	55° 49′	315° 1′	135° 1′	34° 13′	214° 13′	113° 25′	293° 25′	
LVIII (Aupád) and LVII (Yĕdlagattu)	″ h 22·22 h 20·42	″ l 23·30 l 23·54	″ l 23·26 l 23·94	″ l 20·64 l 22·92 l 22·98	″ h 21·90 h 22·04	″ l 21·92 l 23·04	″ l 21·04 l 20·86	″ l 23·86 l 24·32	″ h 22·40 h 24·30	″ h 25·16 h 24·38	$M = 22''·81$ $w = 5·82$ $\frac{1}{w} = 0·17$
	21·32	23·42	23·60	22·18	21·97	22·48	20·95	24·09	23·35	24·77	$C = 37° 55' 22''·81$
LVII (Yĕdlagattu) and LVI (Adakŏnda)	h 55·62 h 54·34	h 54·66 h 52·26 h 52·94	l 51·68 l 50·58	l 54·42 l 51·26 l 51·66	h 50·90 h 50·36	l 50·74 l 50·58	l 51·80 l 49·38 l 50·68	l 49·94 l 48·96	h 51·74 h 52·66	h 51·16 h 51·86	$M = 51''·69$ $w = 3·53$ $\frac{1}{w} = 0·28$
	54·98	53·29	51·13	52·45	50·63	50·66	50·62	49·45	52·20	51·51	$C = 64° 19' 51''·69$

At LV (Lachmipuram)—(*Continued*).

Angle between	Circle readings, telescope being set on LVIII (Aupád) 156° 37′	336° 37′	235° 48′	55° 49′	315° 1′	135° 1′	34° 13′	214° 13′	113° 25′	293° 25′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LVI (Adakŏnda) and LIV (Pothkŏnda)	″ *h* 43.32 *h* 46.14 *h* 47.22	″ *h* 45.48 *h* 45.50	″ *h* 47.36 *h* 46.32	″ *h* 47.48 *h* 47.26	″ *h* 46.98 *h* 47.86 *h* 47.98	″ *h* 46.52 *h* 47.26	″ *h* 49.50 *h* 48.88 *h* 46.32 *h* 49.16	″ *h* 48.94 *h* 48.18	″ *h* 47.24 *h* 48.44	″ *h* 44.14 *h* 45.12	$M = 46''.93$ $w = 4.81$ $\frac{1}{w} = 0.21$
	45.56	45.49	46.84	47.37	47.61	46.89	48.47	48.56	47.84	44.63	$C = 52^\circ\ 38'\ 46''.94$
LIV (Pothkŏnda) and LIII (Náwilmĕtta)	*h* 59.14 *h* 58.26	*h* 61.50 *h* 60.84	*h* 56.42 *h* 56.98	*h* 58.34 *h* 57.86	*h* 56.70 *h* 55.82	*h* 57.28 *h* 55.50	*h* 58.76 *h* 56.26 *h* 54.98	*h* 57.40 *h* 56.66	*h* 60.82 *h* 59.28	*h* 60.26 *h* 61.32	$M = 58''.19$ $w = 2.60$ $\frac{1}{w} = 0.38$
	58.70	61.17	56.70	58.10	56.26	56.39	56.67	57.03	60.05	60.79	$C = 48^\circ\ 29'\ 58''.19$

At LVI (Adakŏnda)

June 1861; *observed by Captain J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on LIV (Pothkŏnda) 176° 37′	356° 37′	255° 50′	75° 50′	335° 1′	155° 1′	54° 13′	234° 13′	133° 26′	313° 26′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LIV (Pothkŏnda) and LIII (Náwilmĕtta)	″ *l* 10.04 *l* 9.80	″ *l* 11.00 *l* 10.92	″ *l* 10.34 *l* 10.14	″ *l* 10.48 *l* 11.02	″ *h* 11.08 *l* 10.88	″ *l* 10.16 *l* 9.68	″ *l* 9.14 *l* 9.00	″ *h* 10.10 *h* 10.12	″ *h* 9.26 *h* 10.44	″ *h* 10.62 *h* 9.26	$M = 10''.17$ $w = 25.60$ $\frac{1}{w} = 0.04$
	9.92	10.96	10.24	10.75	10.98	9.92	9.07	10.11	9.85	9.94	$C = 33^\circ\ 0'\ 10''.17$
LIII (Náwilmĕtta) and LV (Lachmipuram)	*l* 16.02 *l* 15.14	*l* 13.32 *l* 15.12 *d* 14.65	*l* 13.44 *l* 14.28	*l* 13.36 *h* 14.14	*h* 15.66 *h* 13.74 *h* 12.94	*l* 15.28 *l* 14.36	*l* 15.84 *l* 15.50	*h* 16.24 *h* 15.98	*h* 13.76 *h* 13.16	*h* 12.60 *h* 12.68	$M = 14''.44$ $w = 7.26$ $\frac{1}{w} = 0.14$
	15.58	14.36	13.86	13.75	14.11	14.82	15.67	16.11	13.46	12.64	$C = 43^\circ\ 0'\ 14''.44$
LV (Lachmipuram) and LVII (Yĕdlagattu)	*h* 41.02 *l* 41.54	*l* 41.92 *l* 40.74 *d* 41.76	*l* 40.54 *l* 39.28	*l* 41.06 *h* 40.38	*h* 38.90 *l* 40.68	*l* 39.00 *l* 39.58	*l* 41.06 *l* 43.86 *l* 40.84	*h* 41.00 *h* 41.38	*h* 41.86 *h* 40.82	*h* 42.26 *h* 44.30 *h* 42.82	$M = 41''.00$ $w = 6.52$ $\frac{1}{w} = 0.15$
	41.28	41.47	39.91	40.72	39.79	39.29	41.92	41.19	41.34	43.13	$C = 55^\circ\ 29'\ 41''.02$

At LVI (Ádakŏnda)—(*Continued*).

Angle between	Circle readings, telescope being set on LIV (Pothkŏnda) 176° 37′	356° 37′	255° 50′	75° 50′	335° 1′	155° 1′	54° 13′	234° 13′	133° 26′	313° 26′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LVII (Yĕdlagattu) and LX (Parampúdi)	″ h 25·36 l 26·02	″ l 26·26 l 26·22	″ h 24·70 h 23·94	″ h 24·08 h 25·08	″ l 24·86 l 23·90	″ l 24·88 l 25·28	″ l 23·88 l 23·10	″ h 23·26 h 23·86	″ l 26·24 l 26·34	″ h 26·12 l 26·36	$M = 24''·99$ $w = 8·10$ $\frac{1}{w} = 0·12$
	25·69	26·24	24·32	24·58	24·38	25·08	23·49	23·56	26·29	26·24	$C = 51° 53' 24''·99$

At LVII (Yĕdlagattu)

May 1861; *observed by Captain J. P. Basevi, R.E., with Barrow's* 24*-inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on LVIII (Aupád) 0° 1′	180° 1′	79° 13′	259° 12′	158° 25′	338° 25′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LVIII (Aupád) and LIX (Sudkŏnda)	″ h 25·84 h 25·72	″ l 24·24 l 22·74	″ l 22·74 l 24·22	″ l 23·34 h 24·76	″ h 26·86 l 26·00	″ l 26·68 l 26·42	″ l 26·74 l 27·70	″ l 25·80 l 28·02 l 25·42	″ h 25·16 h 25·66	″ h 27·06 h 26·36	$M = 25''·55$ $w = 4·71$ $\frac{1}{w} = 0·21$
	25·78	23·49	23·48	24·05	26·43	26·55	27·22	26·41	25·41	26·71	$C = 84° 13' 25''·55$
LIX (Sudkŏnda) and LX (Parampúdi)	h 55·98 h 55·30	l 55·34 l 56·90	l 55·98 l 57·72	l 55·22 h 54·26	h 54·32 l 56·80 l 54·50 h 55·72	l 54·62 l 54·90	l 52·72 l 51·52	l 53·42 l 51·56 l 52·92	h 55·04 h 54·76	h 54·44 h 54·96	$M = 54''·78$ $w = 4·33$ $\frac{1}{w} = 0·23$
	55·64	56·12	56·85	54·74	55·34	54·76	52·12	52·63	54·90	54·70	$C = 82° 40' 54''·78$
LX (Parampúdi) and LVI (Adakŏnda)	h 15·40 h 17·08	l 17·26 l 17·28	h 15·72 h 16·42	l 16·94 h 17·36	h 19·36 l 17·58	l 18·14 l 16·70	l 18·50 l 18·28	l 19·24 l 19·32	h 17·46 h 18·76	h 16·12 h 17·00	$M = 17''·50$ $w = 7·90$ $\frac{1}{w} = 0·13$
	16·24	17·27	16·07	17·15	18·47	17·42	18·39	19·28	18·11	16·56	$C = 68° 21' 17''·50$
LVI (Adakŏnda) and LV (Lachmipuram)	h 27·26 h 28·52	l 26·80 l 27·26	h 27·00 h 25·78 h 27·06	l 29·82 l 28·06	h 26·88 h 27·74	l 29·10 l 30·28	l 29·92 l 30·56	l 28·88 l 29·54	h 29·44 h 28·10	h 29·38 h 27·82	$M = 28''·43$ $w = 6·32$ $\frac{1}{w} = 0·16$
	27·89	27·03	26·61	28·94	27·31	29·69	30·24	29·21	28·77	28·60	$C = 60° 10' 28''·42$

At LVII (Yĕdlagattu)—(*Continued*).

Angle between	Circle readings, telescope being set on LVIII (Aupád) 0° 1′	180° 1′	79° 13′	259° 12′	158° 25′	338° 25′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LV (Lachmipuram) and LVIII (Aupád)	″ h 56·16 h 55·56	″ l 57·00 l 55·58	″ l 54·28 l 53·08	″ l 53·36 h 55·36 h 54·86	″ h 52·88 h 52·50	″ l 52·02 l 51·22	″ l 51·56 l 51·44	″ l 52·98 l 51·76	″ h 51·96 h 53·08	″ h 52·76 h 53·80	$M = 53''·43$ $w = 3·41$ $\frac{1}{w} = 0·29$
	55·86	56·29	53·68	54·53	52·69	51·62	51·50	52·37	52·52	53·28	$C = 64° 33' 53''·43$

At LVIII (Aupád)

May 1861; *observed by Captain J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

Angle between	Circle readings, telescope being set on LIX (Sudkŏnda) 235° 9′	55° 8′	314° 21′	134° 21′	33° 32′	213° 32′	112° 45′	292° 45′	191° 57′	11° 57′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LIX (Sudkŏnda) and LVII (Yĕdlagattu)	″ l 29·18 l 28·24	″ l 28·52 l 27·80	″ l 28·52 l 29·82	″ l 30·36 l 29·60	″ l 31·24 l 30·46	″ l 30·04 l 30·30	″ l 28·18 l 27·06	″ h 29·36 l 28·62	″ l 28·88 l 30·02	″ l 29·06 l 29·48	$M = 29''·24$ $w = 9·90$ $\frac{1}{w} = 0·10$
	28·71	28·16	29·17	29·98	30·85	30·17	27·62	28·99	29·45	29·27	$C = 47° 21' 29''·24$
LVII (Yĕdlagattu) and LV (Lachmipuram)	h 41·52 h 44·90 h 45·30	h 45·36 h 45·78	l 44·38 l 43·28	l 44·22 l 44·70	l 42·68 l 43·16	l 43·48 l 43·12	h 43·40 h 42·54	h 41·96 h 42·34	l 45·20 l 44·42	l 45·48 l 44·68	$M = 43''·90$ $w = 6·95$ $\frac{1}{w} = 0·14$
	43·91	45·57	43·83	44·46	42·92	43·30	42·97	42·15	44·81	45·08	$C = 77° 30' 43''·90$

At LIX (Sudkŏnda)

†*May* 1861; *observed by Captain J. P. Basevi, R.E., with Barrow's* 24-*inch Theodolite No.* 2.

**December* 1861; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXIII (Dudugat) 125° 46′	305° 46′	204° 59′	24° 59′	284° 11′	104° 11′	3° 23′	183° 23′	82° 35′	262° 35′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* LXIII (Dudugat) and LXI (Bandanchĕrla)	″ l 43·88 l 44·00 l 44·88	″ l 43·46 l 44·14 l 44·26	″ h 44·08 h 40·98 h 42·44 h 41·36	″ h 40·68 h 41·78 h 42·04	″ h 44·80 h 42·46 h 45·02	″ l 43·12 l 42·74 l 43·84	″ l 44·22 l 41·08 l 41·82 l 42·68	″ l 41·80 l 42·14 l 42·96	″ h 43·56 h 40·48 h 40·76 h 41·90	″ h 41·96 h 41·98 l 45·28 l 44·36	$M = 42''·91$ $w = 7·60$ $\frac{1}{w} = 0·13$
	44·25	43·95	42·22	41·50	44·09	43·23	42·45	42·30	41·68	43·40	$C = 73° 46' 42''·90$

At LIX (Sudkŏnda)—(*Continued*).

Angle between	Circle readings, telescope being set on LXIII (Dudugat) 125° 46′	305° 46′	204° 59′	24° 59′	284° 11′	104° 11′	8° 23′	188° 23′	82° 35′	262° 35′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* LXI (Bandanchĕrla) and LX (Parampúdi)	″ h 36·38 l 36·72 l 36·48	″ l 36·34 l 35·24 l 34·90	″ h 37·76 h 36·96 h 35·88	″ h 37·06 h 37·28 h 37·32	″ h 37·04 h 37·74 h 37·96	″ l 37·00 l 36·78 l 36·56	″ l 36·52 l 39·20 l 38·78 l 38·94	″ l 39·16 l 39·32 l 39·26	″ h 38·62 h 38·60 h 38·66	″ h 36·88 h 38·18 h 37·34	M = 37″·42 w = 7·61 1/w = 0·13
	36·53	35·49	36·87	37·22	37·58	36·78	38·36	39·25	38·63	37·47	C = 51° 59′ 37″·42
	Circle readings, telescope being set on LX (Parampúdi) 248° 4′	68° 4′	327° 16′	147° 17′	46° 28′	226° 28′	125° 41′	305° 41′	204° 52′	24° 52′	
† LX (Parampúdi) and LVII (Yĕdlagattu)	″ h 21·48 h 18·52 h 18·62	″ h 18·56 h 19·86	″ l 18·56 l 19·78	″ l 19·16 l 18·30	″ l 20·04 l 20·34	″ l 21·10 l 20·10	″ l 18·70 l 18·82	″ l 20·06 l 19·74	″ l 16·78 l 17·12	″ l 18·02 l 15·92 l 16·98	M = 19″·00 w = 5·76 1/w = 0·17
	19·54	19·21	19·17	18·73	20·19	20·60	18·76	19·90	16·95	16·97	C = 63° 31′ 18″·99
† LVII (Yĕdlagattu) and LVIII (Aupád)	h 3·40 h 5·28 h 5·66	h 7·62 h 6·90	l 6·20 l 4·94	l 7·90 l 7·66	l 5·46 l 4·78	l 4·70 l 5·14	l 4·66 l 5·38	l 5·54 l 5·06	l 7·54 l 7·72	l 7·20 l 9·12 l 8·32	M = 6″·16 w = 4·92 1/w = 0·20
	4·78	7·26	5·57	7·78	5·12	4·92	5·02	5·30	7·63	8·21	C = 48° 25′ 6″·16

At LX (Parampúdi)

‡*May* 1861; *observed by Captain J. P. Basevi, R.E., with Barrow's 24-inch Theodolite No. 2.*

§*December* 1861; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LVI (Adakŏnda) 266° 28′	86° 28′	345° 39′	165° 39′	64° 52′	244° 52′	144° 4′	324° 4′	228° 15′	48° 15′	M = Mean of Groups w = Relative Weight C = Concluded Angle
‡ LVI (Adakŏnda) and LVII (Yĕdlagattu)	″ h 20·44 l 19·96	″ l 19·34 l 18·80	″ h 18·92 h 17·36	″ h 17·28 h 17·52	″ h 19·06 h 18·36	″ h 18·46 h 15·56 h 17·16	″ l 19·98 l 19·08	″ l 18·70 h 20·84 h 20·40	″ l 18·14 l 19·28	″ l 18·56 l 18·88	M = 18″·75 w = 8·00 1/w = 0·13
	20·20	19·07	18·14	17·40	18·71	17·06	19·53	19·98	18·71	18·72	C = 59° 45′ 18″·75
‡ LVII (Yĕdlagattu) and LIX (Sudkŏnda)	l 46·40 l 46·08	l 49·08 l 48·46	l 47·60 l 47·24	l 48·80 l 47·30	h 48·72 h 46·86	h 47·48 h 46·76	l 44·32 l 46·08	l 46·28 l 45·02	l 47·44 l 46·46	l 47·22 l 47·46	M = 47″·05 w = 7·30 1/w = 0·14
	46·24	48·77	47·42	48·05	47·79	47·12	45·20	45·65	46·95	47·34	C = 33° 47′ 47″·05

At LX (Parampúdi)—(*Continued*).

Circle readings, telescope being set on LIX (Sudkŏnda)

M = Mean of Groups; w = Relative Weight; C = Concluded Angle

Angle between	170° 48′	350° 48′	250° 0′	70° 0′	329° 12′	149° 12′	48° 25′	228° 25′	127° 37′	307° 37′	M, w, C
§ LIX (Sudkŏnda) and LXI (Bandanchĕrla)	″ h 42·58	″ l 41·94	″ h 43·60	″ h 44·08	″ h 44·72	″ h 43·22	″ l 43·90	″ l 43·18	″ h 41·78	″ h 42·86	$M = 43''·24$
	h 41·28	l 41·22	h 44·78	h 43·84	h 43·02	h 44·08	l 44·22	l 42·82	h 43·74	h 43·42	$w = 10·37$
									h 43·50		$\frac{1}{w} = 0·10$
	41·93	41·58	44·19	43·96	43·87	43·65	44·06	43·00	43·01	43·14	$C = 42° 23' 43''·24$
§ LXI (Bandanchĕrla) and LXII (Nágaldurgam)	h 24·16	l 24·96	h 23·60	h 21·96	h 23·18	h 23·18	l 24·82	l 23·70	h 24·52	h 24·54	$M = 23''·96$
	h 24·04	l 25·36	h 23·88	h 22·42	h 25·50	h 24·42	l 24·06	l 23·76	h 23·96	h 23·00	$w = 13·80$
					h 24·66						$\frac{1}{w} = 0·07$
	24·10	25·16	23·74	22·19	24·45	23·80	24·44	23·73	24·24	23·77	$C = 72° 22' 23''·96$
§ LXII (Nágaldurgam) and Referring Mark	h 33·72	h 31·80	h 34·52	h 33·10	h 34·76	h 33·56	l 33·78	l 34·74	h 34·32	h 33·38	$M = 33''·48$
	h 34·36	h 31·38	h 33·38	h 34·26	h 32·02	h 32·10	l 33·50	l 34·72	h 33·26	h 33·18	$w = 11·48$
					h 33·14						$\frac{1}{w} = 0·09$
	34·04	31·59	33·95	33·68	33·31	32·83	33·64	34·73	33·79	33·28	$C = 56° 1' 33''·48$

At LXI (Bandanchĕrla)

December 1861; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Circle readings, telescope being set on LXIV (Inupráyi)

M = Mean of Groups; w = Relative Weight; C = Concluded Angle

Angle between	0° 1′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M, w, C
LXIV (Inupráyi) and LXII (Nágaldurgam)	″ h 18·22	″ h 19·90	″ l 18·00	″ l 18·06	″ h 17·36	″ l 17·82	″ l 18·18	″ l 17·78	″ h 16·36	″ h 16·02	$M = 17''·50$
	h 16·38	h 17·92	l 18·40	h 17·52	l 17·54	l 16·60	l 17·06	l 17·98	h 17·58	h 16·86	$w = 18·82$
		l 16·72									$\frac{1}{w} = 0·05$
	17·30	18·18	18·20	17·79	17·45	17·21	17·62	17·88	16·97	16·44	$C = 51° 0' 17''·51$
LXII (Nágaldurgam) and LX (Parampúdi)	h 52·86	h 51·32	l 52·42	l 50·80	h 51·48	l 53·18	l 50·98	l 52·88	h 52·68	h 53·40	$M = 52''·50$
	h 53·74	h 52·98	l 51·38	h 52·48	l 53·12	l 52·98	l 53·56	l 51·44	h 52·28	h 52·92	$w = 20·44$
				h 52·82			l 52·74				$\frac{1}{w} = 0·05$
	53·30	52·15	51·90	52·03	52·30	53·08	52·43	52·16	52·48	53·16	$C = 67° 34' 52''·49$

At LXI (Bandanchĕrla)—(*Continued*).

Angle between	Circle readings, telescope being set on LXIV (Inupráyi) 0°1′	180°1′	79°13′	259°13′	158°24′	338°24′	237°37′	57°37′	316°49′	136°49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
LX (Parampúdi) and LIX (Sudkŏnda)	″ *h* 43·36 *h* 42·64	″ *h* 40·34 *h* 41·68	″ *l* 40·36 *l* 41·04	″ *l* 40·42 *h* 41·14 *h* 41·02	″ *l* 39·44 *l* 38·78	″ *l* 40·96 *l* 40·20	″ *l* 39·36 *l* 38·52	″ *l* 38·54 *l* 42·40 *h* 41·44	″ *h* 42·64 *h* 40·18 *h* 40·58	″ *h* 40·74 *h* 41·96	$M = 40''\cdot75$ $w = 6\cdot25$ $\frac{1}{w} = 0\cdot16$
	43·00	41·01	40·70	40·86	39·11	40·58	38·94	40·79	41·13	41·35	$C = 85° 36' 40''\cdot75$
LIX (Sudkŏnda) and LXIII (Dudugat)	*h* 41·06 *h* 41·38	*h* 42·32 *h* 42·74	*l* 42·60 *l* 43·26	*l* 43·70 *h* 43·32	*l* 43·12 *l* 43·34	*l* 42·20 *l* 42·52	*l* 42·96 *l* 43·50	*l* 44·28 *l* 41·20 *h* 41·16	*h* 40·74 *h* 45·24 *h* 43·24	*h* 41·74 *h* 42·28	$M = 42''\cdot63$ $w = 11\cdot40$ $\frac{1}{w} = 0\cdot09$
	41·22	42·53	42·93	43·51	43·23	42·36	43·23	42·21	43·07	42·01	$C = 74° 13' 42''\cdot63$
LXIII (Dudugat) and LXV (Dálgattu)	*h* 9·26 *h* 9·78	*l* 10·80 *l* 10·90	*l* 8·30 *l* 9·92	*l* 9·86 *h* 12·02 *h* 8·68	*l* 10·66 *l* 11·32	*l* 9·32 *l* 10·96	*l* 10·74 *l* 10·74	*l* 9·22 *l* 9·08	*h* 10·80 *h* 8·90	*h* 10·02 *h* 10·02	$M = 10''\cdot06$ $w = 14\cdot10$ $\frac{1}{w} = 0\cdot07$
	9·52	10·85	9·11	10·19	10·99	10·14	10·74	9·15	9·85	10·02	$C = 34° 36' 10''\cdot06$
LXV (Dálgattu) and LXIV (Inupráyi)	*h* 16·56 *h* 17·74	*l* 17·14 *l* 14·78 *l* 16·38	*l* 16·52 *l* 16·52	*l* 15·58 *h* 16·64	*l* 15·28 *l* 16·38	*l* 16·08 *l* 16·80	*l* 15·80 *l* 15·84	*l* 17·68 *l* 18·78	*h* 15·52 *h* 15·82	*h* 16·62 *h* 17·82	$M = 16''\cdot51$ $w = 12\cdot39$ $\frac{1}{w} = 0\cdot08$
	17·15	16·10	16·52	16·11	15·83	16·44	15·82	18·23	15·67	17·22	$C = 46° 58' 16''\cdot51$

At LXII (Nágaldurgam)

December 1861; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LX (Parampúdi) 102°22′	282°22′	181°34′	1°34′	260°46′	80°46′	339°58′	159°58′	59°10′	239°10′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
LX (Parampúdi) and LXI (Bandanchĕrla)	″ *h* 46·24 *h* 46·00	″ *h* 44·08 *h* 44·32	″ *h* 45·36 *h* 44·20	″ *h* 46·64 *h* 45·04	″ *l* 45·86 *l* 45·82	″ *l* 44·18 *l* 43·68	″ *l* 45·62 *l* 44·82	″ *l* 44·40 *l* 44·38	″ *l* 44·00 *l* 44·08	″ *l* 44·26 *l* 43·60	$M = 44''\cdot83$ $w = 12\cdot30$ $\frac{1}{w} = 0\cdot08$
	46·12	44·20	44·78	45·84	45·84	43·93	45·22	44·39	44·04	43·93	$C = 40° 2' 44''\cdot83$

At LXII (Nágaldurgam)—(*Continued*).

Angle between	Circle readings, telescope being set on LX (Parampúdi) 102° 22′	282° 22′	181° 34′	1° 34′	260° 46′	80° 46′	339° 58′	159° 58′	59° 10′	239° 10′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXI (Bandanchĕrla) and LXIV (Inupráyi)	″ h 23·94 h 23·34	″ h 25·04 h 23·86	″ h 24·12 h 23·72	″ h 22·60 h 23·10	″ l 23·96 l 25·26	″ l 24·80 l 25·20	″ l 24·48 l 24·62	″ l 23·44 l 25·00	″ l 25·40 l 25·02	″ l 25·48 l 25·20	M = 24″·38 w = 14 ·90 1/w = 0 ·07
	23·64	24·45	23·92	22·85	24·61	25·00	24·55	24·22	25·21	25·34	C = 62° 18′ 24″·38

At LXIII (Dudugat)

January 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXVI (Yĕrragattu) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVI (Yĕrragattu) and LXV (Dálgattu)	″ h 28·22 h 28·12	″ h 29·64 h 29·54	″ l 30·60 l 31·00	″ l 30·18 l 30·52	″ h 26·26 h 27·96 h 27·78	″ h 28·84 h 27·60	″ l 29·86 l 27·96	″ l 28·06 l 29·54	″ l 27·42 l 31·86 l 28·26	″ l 29·44 l 29·72	M = 29″·09 w = 6 ·84 1/w = 0 ·15
	28·17	29·59	30·80	30·35	27·33	28·22	28·91	28·80	29·18	29·58	C = 62° 22′ 29″·07
LXV (Dálgattu) and LXI (Bandanchĕrla)	h 34·28 h 33·88	h 34·04 h 32·56	l 32·90 l 33·14	l 32·68 l 35·06 l 33·30	h 36·62 h 34·58 h 35·88	h 33·62 h 34·56	l 33·24 l 34·48	l 36·12 l 32·30 l 35·22	l 34·10 l 31·50 l 34·88	l 32·52 l 32·08	M = 33″·81 w = 8 ·04 1/w = 0 ·12
	34·08	33·30	33·02	33·68	35·69	34·09	33·86	34·55	33·49	32·30	C = 68° 36′ 33″·84
LXI (Bandanchĕrla) and LIX (Sudkŏnda)	h 37·56 h 35·96 h 37·96	l 37·38 l 38·04	l 35·76 l 37·08	l 35·98 l 34·50 l 35·12	h 34·84 h 37·08 h 35·28	h 38·12 h 36·40	h 37·10 l 35·30	l 35·56 l 34·76 l 35·72	l 36·08 l 37·00	h 35·96 h 36·52	M = 36″·38 w = 11 ·20 1/w = 0 ·09
	37·16	37·71	36·42	35·20	35·73	37·26	36·20	35·35	36·54	36·24	C = 39° 51′ 36″·36

At LXIV (Inupráyi)

December 1861; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXII (Nágaldurgam) 188° 26′	8° 26′	267° 39′	87° 39′	346° 50′	166° 50′	66° 2′	246° 2′	145° 14′	325° 14′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXII (Nágaldurgam) and LXI (Bandanchĕrla)	″ h 19·94 h 19·72	″ h 19·86 h 19·50	″ h 21·54 h 20·32	″ h 19·88 h 18·28	″ l 20·82 l 19·78	″ l 19·88 l 19·90	″ l 21·78 l 20·92	″ l 20·12 l 19·02	″ l 20·14 l 20·06	″ l 19·76 l 18·28	M = 19″·98 w = 14 ·70 1/w = 0 ·07
	19·83	19·68	20·93	19·08	20·30	19·89	21·35	19·57	20·10	19·02	C = 66° 41′ 19″·98

At LXIV (Inupráyi)—(*Continued*).

Angle between	Circle readings, telescope being set on LXII (Nágaldurgam) 188° 26′	8° 26′	267° 39′	87° 39′	346° 50′	166° 50′	66° 2′	246° 2′	145° 14′	325° 14′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
LXI (Bandanchĕrla) and LXV (Dálgattu)	″ h 18·80 h 19·94	″ h 20·02 h 20·30	″ h 20·10 h 19·84	″ h 17·74 h 18·50	″ l 18·94 l 19·32	″ l 20·22 l 21·30	″ l 18·04 l 17·58	″ l 19·38 l 19·50	″ l 18·54 l 18·28	″ l 17·78 l 20·00 l 18·56	$M = 19''\cdot 20$ $w = 10\cdot 14$ $\frac{1}{w} = 0\cdot 10$
	19·37	20·16	19·97	18·12	19·13	20·76	17·81	19·44	18·41	18·78	$C = 69^\circ\ 0'\ 19''\cdot 20$
LXV (Dálgattu) and LXVII (Jammalavoidurgam)	h 21·52 h 19·16 h 19·98	h 19·32 h 19·46	h 18·04 h 20·62 h 19·30	h 21·02 h 20·56	l 21·00 l 20·20	l 21·74 l 19·26 l 21·38	l 20·80 l 19·78	l 20·88 l 20·04	l 21·26 l 21·30	l 22·36 l 20·92 l 22·06	$M = 20''\cdot 49$ $w = 12\cdot 46$ $\frac{1}{w} = 0\cdot 08$
	20·22	19·39	19·32	20·79	20·60	20·79	20·29	20·46	21·28	21·78	$C = 52^\circ\ 43'\ 20''\cdot 49$

At LXV (Dálgattu)

January 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXIV (Inupráyi) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	186° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
LXIV (Inupráyi) and LXI (Bandanchĕrla)	″ h 25·42 l 26·36	″ l 25·56 l 26·16	″ l 26·46 l 27·60	″ l 27·12 l 25·96	″ h 24·78 h 26·24	″ h 28·12 h 25·86 l 26·54	″ l 26·32 l 24·94	″ l 27·74 h 26·20	″ h 34·44 h 26·78 h 26·16	″ l 26.42 l 26·06	$M = 26''\cdot 23$ $w = 17\cdot 52$ $\frac{1}{w} = 0\cdot 06$
	25·89	25·86	27·03	26·54	25·51	26·84	25·63	26·97	25·79	26·24	$C = 64^\circ\ 1'\ 26''\cdot 23$
LXI (Bandanchĕrla) and LXIII (Dudugat)	h 18·14 l 18·84	l 18·12 l 18·08	l 16·74 l 15·64	l 16·32 l 18·18	h 18·46 h 17·58	h 15·12 h 16·12	l 17·06 l 18·24	l 17·14 h 18·44	h 20·22 h 18·00 l 18·02	h 15·94 h 16·64	$M = 17''\cdot 42$ $w = 7\cdot 64$ $\frac{1}{w} = 0\cdot 13$
	18·49	18·10	16·19	17·25	18·02	15·62	17·65	17·79	18·75	16·29	$C = 76^\circ\ 47'\ 17''\cdot 43$
LXIII (Dudugat) and LXVI (Yĕrragattu)	h 45·50 l 44·70	l 45·60 l 44·92	l 45·82 l 45·94	l 46·50 l 46·06	h 45·32 h 47·48 l 45·58	h 46·58 l 45·42	l 46·14 l 45·24	h 45·64 h 46·66	h 44·30 h 44·74	h 45·38 h 46·90	$M = 45''\cdot 72$ $w = 20\cdot 63$ $\frac{1}{w} = 0\cdot 05$
	45·10	45·26	45·88	46·28	46·13	46·00	45·69	46·15	44·52	46·14	$C = 78^\circ\ 34'\ 45''\cdot 72$

At LXV (Dálgattu)—(*Continued*).

Angle between	Circle readings, telescope being set on LXIV (Inuprâyi) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
LXVI (Yĕrragattu) and LXVII (Jammalavoidurgam)	″	″	″	″	″	″	″	″	″	″	M = 19″·64
	l 20·04	l 20·38	h 18·50	h 18·28	h 19·82	h 19·18	l 20·24	h 19·86	h 19·82	h 19·30	w = 19·05
	l 20·24	l 20·32	h 19·16	h 18·94	h 17·74	l 19·70	l 20·22	h 21·00	h 19·72	h 19·66	$\frac{1}{w}$ = 0·05
					l 19·88						
	20·14	20·35	18·83	18·61	19·15	19·44	20·23	20·43	19·77	19·48	C = 75° 37′ 19″·64
LXVII (Jammalavoidurgam) and LXIV (Inuprâyi)	l 10·44	l 10·60	h 11·40	h 11·76	h 10·94	h 10·44	l 10·68	h 12·10	h 10·38	l 10·60	M = 10″·79
	l 11·10	l 9·78	h 11·44	h 10·24	h 10·60	l 10·84	l 10·94	h 9·88	h 10·52	l 10·98	w = 46·51
								h 11·22			$\frac{1}{w}$ = 0·02
	10·77	10·19	11·42	11·00	10·77	10·64	10·81	11·07	10·45	10·79	C = 64° 59′ 10″·80

At LXVI (Yĕrragattu)

January 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXIX (Bĕzváda) 231° 14′	51° 14′	310° 26′	130° 26′	29° 37′	209° 37′	108° 50′	288° 50′	188° 2′	8° 2′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
LXIX (Bĕzváda) and LXVIII (Jujúrdurgam)	″	″	″	″	″	″	″	″	″	″	M = 51″·22
	l 51·12	l 50·08	l 53·56	l 51·44	l 50·66	h 50·12	l 51·36	l 52·46	l 51·46	l 49·10	w = 8·90
	l 50·58	l 50·74	l 52·36	l 53·30	l 51·74	h 50·96	l 51·32	l 51·26	l 50·84	l 49·98	$\frac{1}{w}$ = 0·11
	50·85	50·41	52·96	52·37	51·20	50·54	51·34	51·86	51·15	49·54	C = 80° 22′ 51″·22
LXVIII (Jujúrdurgam) and LXVII (Jammalavoidurgam)	l 33·38	l 34·56	l 33·38	l 33·58	l 35·28	h 33·60	h 33·76	l 33·46	l 32·60	l 34·70	M = 33″·58
	l 32·50	l 33·04	l 33·84	l 32·96	l 33·70	h 34·12	l 32·52	l 32·36	l 33·12	l 35·12	w = 16·10
											$\frac{1}{w}$ = 0·06
	32·94	33·80	33·61	33·27	34·49	33·86	33·14	32·91	32·86	34·91	C = 66° 50′ 33″·58
LXVII (Jammalavoidurgam) and LXV (Dálgattu)	h 34·56	h 36·30	l 36·08	l 31·92	l 34·90	h 35·80	h 35·60	l 34·94	l 37·68	l 35·88	M = 35″·40
	h 33·52	h 35·36	l 33·52	l 34·80	h 35·46	h 36·88	l 36·02	l 36·20	l 37·00	l 34·86	w = 7·32
			l 34·12	l 35·18							$\frac{1}{w}$ = 0·14
	34·04	35·83	34·57	33·97	35·18	36·34	35·81	35·57	37·34	35·37	C = 44° 56′ 35″·38
LXV (Dálgattu) and LXIII (Dudugat)	h 48·02	h 46·92	l 47·20	l 50·80	l 48·98	h 45·56	h 46·50	l 47·70	l 46·52	l 48·38	M = 47″·42
	h 47·46	h 47·26	l 49·48	l 48·42	h 47·28	h 44·76	l 46·86	l 47·04	l 45·60	l 48·14	w = 5·88
			l 49·46	l 47·66							$\frac{1}{w}$ = 0·17
	47·74	47·09	48·71	48·96	48·13	45·16	46·68	47·37	46·06	48·26	C = 39° 2′ 47″·44

At LXVII (Jammalavoidurgam)

January 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXIV (Inupráyi) 205° 43'	25° 43'	284° 55'	104° 55'	4° 6'	184° 6'	83° 19'	263° 19'	162° 31'	342° 31'	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXIV (Inupráyi) and LXV (Dálgattu)	″ h 30·72 h 29·90	″ h 30·48 h 31·10	″ l 29·88 l 29·56	″ l 30·58 l 29·70	″ l 31·60 l 29·86	″ l 30·56 l 31·18	″ h 30·02 h 29·58	″ h 30·32 h 30·30	″ h 30·08 h 29·94	″ l 29·10 l 28·32	$M = 30''\cdot14$ $w = 20\cdot40$ $\frac{1}{w} = 0\cdot05$
	30·31	30·79	29·72	30·14	30·73	30·87	29·80	30·31	30·01	28·71	$C = 62^\circ\ 17'\ 30''\cdot14$
LXV (Dálgattu) and LXVI (Yĕrragattu)	h 6·18 h 7·10	h 6·34 h 7·54	l 7·56 l 6·70	l 7·18 l 6·72	l 6·08 l 6·80	l 6·56 l 6·44	h 7·26 h 7·02	h 7·64 h 6·68	h 6·36 h 7·26	l 7·66 l 8·68	$M = 6''\cdot99$ $w = 30\cdot30$ $\frac{1}{w} = 0\cdot03$
	6·64	6·94	7·13	6·95	6·44	6·50	7·14	7·16	6·81	8·17	$C = 59^\circ\ 26'\ 6''\cdot99$
LXVI (Yĕrragattu) and LXVIII (Jujúrdurgam)	h 51·14 h 50·08	h 51·60 h 50·94	l 51·64 l 51·34	l 50·80 l 51·14	l 52·02 l 52·26	l 51·94 l 50·98	h 49·52 h 51·20	h 49·70 h 51·34	h 51·84 h 51·42	l 50·76 l 49·98	$M = 51''\cdot08$ $w = 20\cdot40$ $\frac{1}{w} = 0\cdot05$
	50·61	51·27	51·49	50·97	52·14	51·46	50·36	50·52	51·63	50·37	$C = 39^\circ\ 26'\ 51''\cdot08$
LXVIII (Jujúrdurgam) and LXX (Jŏnnalagadda)	h 28·60 h 29·56	l 29·86 l 29·28	l 30·30 l 29·66	l 29·26 l 29·00	l 30·04 l 29·68	l 29·16 l 29·34	h 31·62 h 29·80	h 30·40 h 29·78	l 29·26 l 29·92	l 31·60 l 31·22	$M = 29''\cdot87$ $w = 16\cdot10$ $\frac{1}{w} = 0\cdot06$
	29·08	29·57	29·98	29·13	29·86	29·25	30·71	30·09	29·59	31·41	$C = 44^\circ\ 31'\ 29''\cdot87$

At LXVIII (Jujúrdurgam)

January and February 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXVI (Yĕrragattu) 0° 1'	180° 1'	79° 13'	259° 13'	158° 25'	338° 25'	237° 37'	57° 36'	316° 49'	136° 49'	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVI (Yĕrragattu) and LXIX (Bĕzváda)	″ h 9·10 l 7·86	″ h 10·02 h 9·86	″ l 9·02 l 9·88 l 9·70	″ h 8·80 h 9·32	″ l 7·90 l 7·50	″ l 9·44 l 9·66	″ l 9·40 l 8·28	″ h 9·54 h 9·66	″ h 8·84 h 9·16	″ l 9·16 l 8·62	$M = 9''\cdot06$ $w = 20\cdot89$ $\frac{1}{w} = 0\cdot05$
	8·48	9·94	9·53	9·06	7·70	9·55	8·84	9·60	9·00	8·89	$C = 44^\circ\ 25'\ 9''\cdot06$

At LXVIII (Jujúrdurgam)—(*Continued*).

Angle between	Circle readings, telescope being set on LXVI (Yĕrragattu)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 1′	79° 18′	259° 13′	158° 25′	338° 25′	237° 37′	57° 36′	316° 49′	136° 49′	
LXIX (Bĕzváda) and LXXI (Anantavaram)	″ h 18·70 l 18·50	″ h 19·36 h 19·26	″ l 19·76 l 17·26 l 16·00	″ h 18·92 h 17·88	″ l 17·94 l 19·64	″ l 16·98 l 14·96 l 17·74 l 17·90	″ l 17·76 l 18·18	″ h 18·88 h 18·50	″ h 19·32 h 18·36	″ l 19·02 l 18·86	M = 18″·41 w = 12 ·08 $\frac{1}{w}$ = 0 ·08
	18·60	19·31	17·67	18·40	18·79	16·90	17·97	18·69	18·84	18·94	C = 48° 25′ 18″·36
LXXI (Anantavaram) and LXXII (Chintalapád)	l 56·80 l 55·66	h 53·60 h 54·24	l 55·24 l 54·58	h 54·34 h 54·62	l 56·82 l 54·92	l 57·58 l 57·28	l 54·42 l 56·60 l 55·14	h 54·46 h 54·78	h 54·86 h 55·18	l 53·78 l 55·40	M = 55″·25 w = 8 ·24 $\frac{1}{w}$ = 0 ·12
	56·23	53·92	54·91	54·48	55·87	57·43	55·39	54·62	55·02	54·59	C = 66° 13′ 55″·25
LXXII (Chintalapád) and LXX (Jŏnnalagadda)	l 40·56 l 41·22	h 41·32 h 43·34 h 42·92	l 42·06 l 41·52	h 43·38 h 43·68	l 41·56 l 42·34	l 40·60 l 40·96	l 41·28 l 41·66 l 42·84	h 42·50 h 44·04	h 41·76 h 42·16	l 44·40 l 42·38 l 42·82	M = 42″·18 w = 9 ·45 $\frac{1}{w}$ = 0 ·11
	40·89	42·53	41·79	43·53	41·95	40·78	41·93	43·27	41·96	43·20	C = 57° 24′ 42″·19
LXX (Jŏnnalagadda) and LXVII (Jammalavoidurgam)	h 17·82 l 17·14	h 16·82 h 16·52	l 17·12 l 16·46	h 16·32 h 16·80	l 17·64 l 18·70	l 17·10 l 16·42	l 17·38 l 14·68 l 17·12	h 17·96 h 16·40	h 18·22 h 17·80	l 16·90 l 18·36	M = 17″·16 w = 16 ·92 $\frac{1}{w}$ = 0 ·06
	17·48	16·67	16·79	16·56	18·17	16·76	16·39	17·18	18·01	17·63	C = 69° 48′ 17″·15
LXVII (Jammalavoidurgam) and LXVI (Yĕrragattu)	h 37·16 l 37·88	h 37·26 h 36·88	l 38·06 l 39·06	h 37·90 h 36·18	l 37·94 l 37·08	l 40·10 l 39·38 l 39·34	l 37·72 l 39·36	h 37·48 h 37·70	h 36·68 h 37·72	l 36·98 l 36·56	M = 37″·74 w = 10 ·96 $\frac{1}{w}$ = 0 ·09
	37·52	37·07	38·56	37·04	37·51	39·61	38·54	37·59	37·20	36·77	C = 73° 42′ 37″·75

At LXIX (Bĕzváda)

February 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXI (Anantavaram)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	110° 52′	290° 52′	190° 4′	10° 4′	269° 15′	89° 15′	348° 28′	168° 28′	67° 40′	247° 40′	
LXXI (Anantavaram) and LXVIII (Jujúrdurgam)	″ h 55·84 h 55·52	″ h 55·82 h 54·34	″ l 55·16 l 55·30	″ l 53·80 l 53·94	″ l 54·46 l 53·40	″ l 54·06 l 53·14	″ l 54·58 l 54·52	″ l 54·20 l 55·28	″ l 55·66 l 55·46	″ l 53·06 l 53·90	M = 54″·57 w = 13 ·30 $\frac{1}{w}$ = 0 ·08
	55·68	55·08	55·23	53·87	53·93	53·60	54·55	54·74	55·56	53·48	C = 55° 38′ 54″·57

At LXIX (Bĕzváda)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXI (Anantavaram) 110° 52′	290° 52′	190° 4′	10° 4′	269° 15′	89° 15′	348° 28′	168° 28′	67° 40′	247° 40′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVIII (Jujúrdurgam) and LXVI (Yĕrragattu)	″ h 58·48 h 60·14	″ h 58·74 h 60·18	″ l 59·66 l 58·68	″ l 60·46 l 58·84	″ l 61·74 l 61·20	″ l 61·38 l 61·32	″ l 60·04 l 59·74	″ l 62·02 l 60·86	″ l 59·48 l 60·10	″ l 63·66 l 61·74 l 62·52	$M = 60''·42$ $w = 6·23$ $\frac{1}{w} = 0·16$
	59·31	59·46	59·17	59·65	61·47	61·35	59·89	61·44	59·79	62·64	$C = 55° 12' 0''·43$

At LXX (Jŏnnalagadda)

January 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24*-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXVII (Jammalavoidurgam) 127° 38′	307° 38′	206° 50′	26° 50′	286° 2′	106° 2′	5° 14′	185° 14′	84° 26′	264° 26′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVII (Jammalavoidurgam) and LXVIII (Jujúrdurgam)	″ l 14·94 l 13·82	″ h 13·80 l 14·36	″ l 13·60 l 13·02	″ l 13·84 l 13·86	″ l 14·02 l 12·86	″ l 15·18 l 14·50	″ l 12·68 l 13·26	″ l 14·46 l 14·08	″ h 15·66 h 12·78 h 13·48	″ h 16·06 h 13·70 h 14·12	$M = 13''·97$ $w = 17·20$ $\frac{1}{w} = 0·06$
	14·38	14·08	13·31	13·85	13·44	14·84	12·97	14·27	13·97	14·63	$C = 65° 40' 13''·98$
LXVIII (Jujúrdurgam) and LXXII (Chintalapád)	h 41·56 l 42·04	h 41·28 h 41·20	l 40·64 l 41·38	l 41·72 l 41·50	l 42·32 l 41·68	l 41·12 l 40·22	l 43·20 l 40·76 l 43·62	l 42·56 l 41·02	h 40·70 h 41·96	h 40·90 h 41·52	$M = 41''·52$ $w = 20·74$ $\frac{1}{w} = 0·05$
	41·80	41·24	41·01	41·61	42·00	40·67	42·53	41·79	41·33	41·21	$C = 61° 56' 41''·54$

At LXXI (Anantavaram)

February 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24*-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXIV (Gorantla) 274° 10′	94° 10′	353° 22′	173° 22′	72° 33′	252° 34′	151° 46′	331° 46′	230° 58′	50° 58′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXXIV (Gorantla) and LXXIII (Lagadapád)	″ h 19·80 h 19·98	″ h 20·78 h 20·88	″ l 19·68 l 18·84	″ l 22·10 l 21·50	″ l 21·94 l 21·00	″ l 20·84 l 21·72	″ l 21·82 l 20·62	″ l 21·76 l 21·52	″ h 19·14 h 19·78	″ l 21·58 l 21·34	$M = 20''·83$ $w = 10·50$ $\frac{1}{w} = 0·10$
	19·89	20·83	19·26	21·80	21·47	21·28	21·22	21·64	19·46	21·46	$C = 87° 5' 20''·83$
LXXIII (Lagadapád) and LXXII (Chintalapád)	h 20·44 h 19·22	h 18·82 h 18·38	h 20·56 l 20·66	l 18·78 l 19·06	l 19·14 l 19·64	l 19·78 l 17·92	l 18·14 l 19·14	h 19·14 h 19·30	h 19·26 l 19·12	l 19·98 l 18·92	$M = 19''·27$ $w = 21·30$ $\frac{1}{w} = 0·05$
	19·83	18·60	20·61	18·92	19·39	18·85	18·64	19·22	19·19	19·45	$C = 49° 56' 19''·27$

At LXXI (Anantavaram)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXIV (Gorantla)										M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	274° 10′	94° 10′	353° 22′	173° 22′	72° 33′	252° 34′	151° 46′	331° 46′	230° 58′	50° 58′	
LXXII (Chintalapád) and LXVIII (Jujúrdurgam)	″ h 31·56	″ h 30·54	″ h 31·44	″ l 31·82	″ l 31·48	″ l 31·76	″ l 32·08	″ h 32·72	″ h 32·68	″ h 32·22	$M = 31''·77$
	h 32·22	h 31·44	l 31·28	l 29·28	l 31·32	l 33·26	l 31·82	h 31·96	h 32·36	h 31·50	$w = 19·81$
				l 31·58							$\frac{1}{w} = 0·05$
	31·89	30·99	31·36	30·89	31·40	32·51	31·95	32·34	32·52	31·86	$C = 61° 11' 31''·76$
LXVIII (Jujúrdurgam) and LXIX (Bĕzváda)	h 48·42	h 49·94	h 48·66	l 48·50	l 48·18	l 48·96	l 47·98	h 46·68	h 47·28	h 47·58	$M = 48''·25$
	h 48·44	h 48·74	l 48·34	l 47·92	l 48·16	l 47·78	l 47·82	h 48·32	h 49·18	h 48·20	$w = 28·25$
								h 47·50			$\frac{1}{w} = 0·04$
	48·43	49·34	48·50	48·21	48·17	48·37	47·90	47·50	48·23	47·89	$C = 75° 55' 48''·24$

At LXXII (Chintalapád)

*February and †*April* 1862; observed by Captain J. P. Basevi, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXX (Jŏnnalagadda)										M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	216° 29′	36° 29′	295° 41′	115° 41′	14° 52′	194° 52′	94° 4′	274° 4′	173° 17′	353° 17′	
* LXX (Jŏnnalagadda) and LXVIII (Jujúrdurgam)	″ h 37·68	″ l 36·12	″ l 38·68	″ l 38·28	″ l 38·70	″ h 39·18	″ l 38·86	″ l 36·76	″ l 36·22	″ l 34·86	$M = 37''·18$
	h 37·14	l 35·56	l 36·64	l 37·94	l 38·06	h 37·22	l 37·06	l 37·28	l 36·44	l 36·30	$w = 8·25$
			l 37·16			h 37·16				h 35·04	$\frac{1}{w} = 0·12$
	37·41	35·84	37·49	38·11	38·38	37·85	37·96	37·02	36·33	35·40	$C = 60° 38' 37''·18$
* LXVIII (Jujúrdurgam) and LXXI (Anantavaram)	h 33·44	l 35·46	l 33·64	l 34·40	l 33·34	h 33·14	l 34·94	l 35·28	l 35·74	l 35·00	$M = 34''·30$
	h 33·52	l 34·04	l 33·62	l 34·04	l 34·06	h 35·40	l 33·94	l 33·58	l 34·36	l 34·34	$w = 21·61$
						h 35·26					$\frac{1}{w} = 0·05$
	33·48	34·75	33·63	34·22	33·70	34·60	34·44	34·43	35·05	34·67	$C = 52° 34' 34''·30$
* LXXI (Anantavaram) and LXXIII (Lagadapád)	h 51·56	l 53·60	l 51·92	l 50·02	l 51·96	h 51·90	l 50·14	l 49·72	l 51·68	l 51·10	$M = 51''·52$
	h 53·46	l 53·50	l 51·44	l 51·52	l 49·92	h 51·34	l 51·36	l 51·70	l 50·18	l 50·30	$w = 7·69$
					h 54·04						$\frac{1}{w} = 0·13$
	52·51	53·55	51·68	50·77	51·97	51·62	50·75	50·71	50·93	50·70	$C = 51° 35' 51''·53$

At LXXII (Chintalapád)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXIII (Lagadapád) 64° 25′	244° 25′	143° 37′	323° 37′	222° 49′	42° 49′	302° 1′	122° 0′	21° 18′	201° 18′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† LXXIII (Lagadapád) and LXXV (Chikri)	″ h 50·22 h 50·06	″ h 50·90 h 49·64	″ h 49·90 h 49·06	″ l 48·76 l 48·14	″ l 48·86 l 49·34	″ l 48·06 l 48·52	″ l 50·74 l 50·50	″ l 50·68 l 50·30	″ l 50·34 l 49·80	″ l 50·38 l 48·10 l 50·18	$M = 49''\cdot65$ $w = 12\cdot19$ $\frac{1}{w} = 0\cdot08$
	50·14	50·27	49·48	48·45	49·10	48·29	50·62	50·49	50·07	49·55	$C = 64° 23' 49''\cdot65$

At LXXIII (Lagadapád)

‡*February,* §*February and March and* ‖*April* 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on X (Ádamsáb) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
‖ X (Ádamsáb) and VII (Dhúlipalla)	″ h 14·68 l 18·90 l 17·72	″ l 15·46 l 17·34 l 16·38	″ l 17·70 l 18·54	″ l 17·90 l 17·62	″ l 17·22 l 15·64	″ l 16·62 l 17·10	″ l 15·84 l 18·56 l 14·82	″ l 16·64 l 16·64	″ l 15·34 l 17·36 l 16·54	″ l 15·98 l 17·64	$M = 16''\cdot89$ $w = 12\cdot28$ $\frac{1}{w} = 0\cdot08$
	17·10	16·39	18·12	17·76	16·43	16·86	16·41	16·64	16·41	16·81	$C = 80° 12' 16''\cdot86$
‖ VII (Dhúlipalla) and LXXV (Chikri)	l 34·96 l 33·60	l 34·40 l 35·00	l 35·12 l 34·28	l 32·12 l 31·22 l 33·10	l 32·70 l 32·86	l 34·94 l 35·14	l 32·62 l 32·72	l 33·16 l 32·72	l 34·08 l 32·22	l 33·98 l 33·78	$M = 33''\cdot63$ $w = 8\cdot54$ $\frac{1}{w} = 0\cdot12$
	34·28	34·73	34·70	32·15	32·78	35·04	32·67	32·94	33·15	33·88	$C = 54° 57' 33''\cdot62$
‖ LXXV (Chikri) and LXXII (Chintalapád)	l 51·22 l 51·66	l 52·40 l 52·60	l 50·16 l 50·48	l 53·00 l 55·48 l 52·28	l 51·94 l 52·30	l 50·36 l 51·94	l 52·14 l 53·06	l 51·66 l 52·02	l 52·02 l 51·56	l 52·44 l 51·48	$M = 51''\cdot93$ $w = 10\cdot18$ $\frac{1}{w} = 0\cdot10$
	51·44	52·50	50·32	53·59	52·12	51·15	52·60	51·84	51·79	51·96	$C = 59° 3' 51''\cdot94$
‡ LXXII (Chintalapád) and LXXI (Anantavaram)	h 50·34 l 49·40	l 48·46 l 49·42	l 48·82 l 49·30	l 49·08 l 50·36	h 49·00 l 50·22	l 49·32 l 50·14	l 49·40 l 49·54	l 48·82 l 49·96	l 48·66 l 48·88	l 48·16 l 50·02	$M = 49''\cdot37$ $w = 35\cdot70$ $\frac{1}{w} = 0\cdot03$
	49·87	48·94	49·06	49·72	49·61	49·73	49·47	49·39	48·77	49·09	$C = 78° 27' 49''\cdot37$

At LXXIII (Lagadapád)—(*Continued*).

Angle between	Circle readings, telescope being set on X (Ádamsáb)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	816° 49′	136° 49′	
‡ LXXI (Anantavaram) and LXXIV (Gorantla)	″ h 52·48 l 53·22	″ l 54·66 l 54·90	″ l 52·86 l 52·02	″ l 54·02 l 53·08	″ h 53·38 l 53·92	″ l 53·76 l 54·94	″ l 53·94 l 53·74	″ l 53·14 l 53·14	″ h 53·78 l 53·82	″ l 55·14 l 53·84	$M = 53''\cdot69$ $w = 16\cdot10$ $\frac{1}{w} = 0\cdot06$
	52·85	54·78	52·44	53·55	53·65	54·35	53·84	53·14	53·80	54·49	$C = 45°\ 3'\ 53''\cdot69$
§ LXXIV (Gorantla) and X (Ádamsáb)	h 35·84 l 34·40	l 31·42 h 33·34 h 33·24	l 35·66 l 36·10	l 34·86 l 33·68	h 33·90 h 33·84	l 31·72 l 32·52	l 33·76 l 34·00	l 34·62 l 33·96	h 34·36 l 33·54	l 33·64 l 33·82	$M = 33''\cdot98$ $w = 7\cdot83$ $\frac{1}{w} = 0\cdot13$
	35·12	32·67	35·88	34·27	33·87	32·12	33·88	34·29	33·95	33·73	$C = 42°\ 14'\ 33''\cdot97$

At LXXIV (Gorantla)

February 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on X (Ádamsáb)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	115° 37′	295° 37′	194° 49′	14° 49′	274° 2′	94° 2′	353° 14′	173° 14′	72° 26′	252° 26′	
X (Ádamsáb) and LXXIII (Lagadapád)	″ h 25·12 h 24·66	″ h 24·34 h 24·84	″ l 23·44 l 22·36	″ l 24·42 l 24·32	″ l 24·64 l 23·62	″ l 24·10 l 24·40	″ l 23·28 l 21·60	″ l 21·22 l 22·72	″ l 22·06 l 22·68	″ l 23·22 l 23·08	$M = 23''\cdot51$ $w = 8\cdot10$ $\frac{1}{w} = 0\cdot12$
	24·89	24·59	22·90	24·37	24·13	24·25	22·44	21·97	22·37	23·15	$C = 67°\ 45'\ 23''\cdot51$
LXXIII (Lagadapád) and LXXI (Anantavaram)	l 45·68 l 46·44	l 46·52 l 45·66	l 46·30 l 46·42	l 46·30 l 45·12	l 44·96 l 46·54	l 45·36 l 44·92	l 45·34 l 46·10	l 45·88 l 45·24	h 45·66 h 47·14	h 46·08 h 47·18	$M = 45''\cdot94$ $w = 30\cdot30$ $\frac{1}{w} = 0\cdot03$
	46·06	46·09	46·36	45·71	45·75	45·14	45·72	45·56	46·40	46·63	$C = 47°\ 50'\ 45''\cdot94$

At LXXV (Chikri)

April 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXII (Chintalapád)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	107° 32′	287° 32′	186° 44′	6° 43′	265° 55′	85° 55′	345° 7′	165° 7′	64° 19′	244° 19′	
LXXII (Chintalapád) and LXXIII (Lagadapád)	″ h 21·04 h 20·46	″ h 19·62 h 20·40	″ h 19·34 h 19·56	″ h 21·24 h 18·04 l 19·18	″ l 22·26 l 21·10	″ l 20·86 l 20·80	″ l 18·96 l 18·54	″ l 19·26 l 18·42	″ l 20·62 l 19·54	″ l 18·78 l 20·54	$M = 19''\cdot95$ $w = 9\cdot37$ $\frac{1}{w} = 0\cdot11$
	20·75	20·01	19·45	19·49	21·68	20·83	18·75	18·84	20·08	19·66	$C = 56°\ 32'\ 19''\cdot95$

At LXXV (Chikri)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXII (Chintalapád)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	107° 32′	287° 32′	186° 44′	6° 43′	265° 55′	85° 55′	345° 7′	165° 7′	64° 19′	244° 19′	
LXXIII (Lagadapád) and VII (Dhúlipalla)	″ h 27·10 h 26·60	″ h 25·08 h 23·86	″ h 25·02 h 26·04	″ h 22·34 h 24·60 l 25·52	″ l 26·66 l 25·06	″ l 22·44 l 24·60 l 23·94	″ l 26·04 l 25·36	″ l 27·00 l 27·96	″ l 25·74 l 25·30	″ l 25·86 l 24·82	$M = 25''\cdot46$ $w = 6\cdot18$ $\frac{1}{w} = 0\cdot16$
	26·85	24·47	25·53	24·15	25·86	23·66	25·70	27·48	25·52	25·34	$C = 50^\circ\ 58'\ 25''\cdot44$

At VII (Dhúlipalla)

April 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXV (Chikri)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	138° 28′	318° 28′	217° 39′	37° 39′	296° 51′	116° 51′	16° 3′	196° 3′	95° 15′	275° 15′	
LXXV (Chikri) and LXXIII (Lagadapád)	″ h 61·58 h 62·30	″ l 61·74 l 62·38	″ l 61·28 l 59·70	″ l 61·88 l 61·08	″ l 61·96 l 60·58	″ l 61·48 l 60·60	″ l 60·00 l 61·98	″ l 62·94 l 62·14	″ l 63·00 l 63·48	″ l 62·28 l 61·80	$M = 61''\cdot71$ $w = 12\cdot00$ $\frac{1}{w} = 0\cdot08$
	61·94	62·06	60·49	61·48	61·27	61·04	60·99	62·54	63·24	62·04	$C = 74^\circ\ 4'\ 1''\cdot71$
LXXIII (Lagadapád) and X (Ádamsáb)	h 36·10 h 34·84	l 34·60 l 33·28	l 34·80 l 36·82 l 34·24	l 37·48 l 36·36	l 35·32 l 35·50	l 36·32 l 33·36 l 36·12	l 35·40 l 35·24	l 33·86 l 36·84 l 35·38	l 35·64 l 34·86	l 35·98 l 36·36	$M = 35''\cdot44$ $w = 11\cdot25$ $\frac{1}{w} = 0\cdot09$
	35·47	33·94	35·29	36·92	35·41	35·27	35·32	35·36	35·25	36·17	$C = 64^\circ\ 22'\ 35''\cdot43$

At X (Ádamsáb)

April 1862; *observed by Captain J. P. Basevi, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VII (Dhúlipalla)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	105° 26′	285° 26′	184° 38′	4° 38′	263° 50′	83° 50′	343° 2′	163° 2′	62° 14′	242° 14′	
VII (Dhúlipalla) and LXXIII (Lagadapád)	″ l 10·82 l 8·54 l 9·78	″ l 9·86 l 9·02	″ l 10·26 l 10·78	″ l 10·74 l 8·06 h 7·42	″ h 8·90 h 8·62	″ h 8·92 h 7·40	″ l 8·50 l 7·66	″ l 5·84 l 6·44 l 8·94 l 8·10	″ h 7·24 h 8·08	″ h 8·94 h 9·62	$M = 8''\cdot77$ $w = 7\cdot58$ $\frac{1}{w} = 0\cdot13$
	9·71	9·44	10·52	8·74	8·76	8·16	8·08	7·33	7·66	9·28	$C = 35^\circ\ 25'\ 8''\cdot76$

At X (Ádamsáb)—(*Continued*).

Angle between	Circle readings, telescope being set on VII (Dhúlipalla)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	105° 26′	285° 26′	184° 38′	4° 38′	263° 50′	83° 50′	343° 2′	163° 2′	62° 14′	242° 14′	
LXXIII (Lagadapád) and LXXIV (Gorantla)	″ h 4·56 l 2·72 l 2·04	″ l 1·94 l 1·10	″ l 2·58 l 4·34	″ l 2·82 l 4·02	″ h 4·04 h 3·80	″ h 3·58 h 2·64	″ h 2·08 l 3·94	″ l 4·80 l 4·04	″ h 3·44 h 3·52	″ h 2·78 h 3·42	$M = 3''·26$ $w = 12·95$ $\frac{1}{w} = 0·08$
	3·11	1·52	3·46	3·42	3·92	3·11	3·01	4·42	3·48	3·10	$C = 70°\ 0'\ 3''·26$

October, 1883.

W. H. COLE,
In charge of Computing Office.

In the calculations of the weights of the observed angles by the formula given in Section 4 of Chapter VII of Volume II and illustrated by an example in the foot note to page 342 of the same Volume, it is necessary to employ the squares of the *apparent* errors of observation and graduation. These data have been employed to 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 as follows:—

Troughton and Simms' 36-inch Theodolite, Troughton and Simms' 24-inch Theodolite No. 1, and Barrow's 24-inch Theodolite No. 2, all of them having 5 microscopes to read the azimuth circle; observations were taken on 5 pairs of zeros (*face right* and *face left*) giving circle readings at 7° 12′ apart.

The *e.m.s. of observation* of a single measure of an angle $= \sqrt{\dfrac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$

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

Group	Observer and Instrument	Position of stations	Interval between microscope readings of circle	Number of: Measures on each zero (average)	Number of: Angles	Number of: Single measures	Number of: Single zeros	*e. m. s.* of observation of a single measure	*e. m. s.* of graduation and observation of a single zero
I	Mr. G. Shelverton, Troughton and Simms' 36-inch Theodolite.	Hills	7° 12′	3·01	32	964	320	$\left\{\frac{313\cdot53}{964-320}\right\}^{\frac{1}{2}} = \pm\ 0''\cdot698$	$\left\{\frac{214\cdot50}{320-32}\right\}^{\frac{1}{2}} = \pm\ 0''\cdot863$
II	Capt. B. R. Branfill, Troughton and Simms' 24-inch Theodolite No. 1.	Hills	7 12	2·43	106	2578	1060	$\left\{\frac{1759\cdot04}{2578-1060}\right\}^{\frac{1}{2}} = \pm\ 1\ \cdot076$	$\left\{\frac{691\cdot79}{1060-106}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot852$
III	Ditto.	Plains	7 12	2·25	30	776	300	$\left\{\frac{534\cdot42}{776-300}\right\}^{\frac{1}{2}} = \pm\ 1\ \cdot060$	$\left\{\frac{158\cdot75}{300-30}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot767$
IV	Lieut. J. P. Basevi, Barrow's 24-inch Theodolite No. 2.	Hills	7 12	2·19	49	1072	490	$\left\{\frac{398\cdot68}{1072-490}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot828$	$\left\{\frac{702\cdot94}{490-49}\right\}^{\frac{1}{2}} = \pm\ 1\ \cdot263$
V	Ditto.	Plains	7 12	2·11	10	211	100	$\left\{\frac{80\cdot64}{211-100}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot852$	$\left\{\frac{140\cdot90}{100-10}\right\}^{\frac{1}{2}} = \pm\ 1\ \cdot251$
VI	Lieut. J. P. Basevi, Troughton and Simms' 24-inch Theodolite No. 1.	Hills	7 12	2·16	56	1209	560	$\left\{\frac{462\cdot38}{1209-560}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot844$	$\left\{\frac{350\cdot48}{560-56}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot834$
VII	Ditto.	Plains	7 12	2·13	12	256	120	$\left\{\frac{109\cdot48}{256-120}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot897$	$\left\{\frac{73\cdot32}{120-12}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot824$
II, III VI and VII	Capt. B. R. Branfill and Lieut. J. P. Basevi, Troughton and Simms' 24-inch Theodolite No. 1.	Hills and Plains	7 12	2·36	204	4819	2040	$\left\{\frac{2865\cdot32}{4819-2040}\right\}^{\frac{1}{2}} = \pm\ 1\ \cdot015$	$\left\{\frac{1274\cdot29}{2040-204}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot833$
IV and V	Lieut. J. P. Basevi, Barrow's 24-inch Theodolite No. 2.	Hills and Plains	7 12	2·17	59	1283	590	$\left\{\frac{479\cdot32}{1283-590}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot832$	$\left\{\frac{843\cdot84}{590-59}\right\}^{\frac{1}{2}} = \pm\ 1\ \cdot261$

October 1883.

W. H. COLE,
In charge of Computing Office.

MADRAS MERIDIONAL AND COAST SERIES.

PRINCIPAL TRIANGULATION. REDUCTION OF FIGURES.

Figure No. 89.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	49	48	5·04	·05
2	35	35	32·94	·05
3	49	3	40·88	·06
4	45	32	43·33	·07
5	40	12	46·58	·07
6	45	10	52·04	·04
7	40	5	52·17	·05
8	54	30	32·22	·18

Equations to be satisfied (Factor)

$$x_1 + x_2 + x_3 + x_4 = e_1 = -0{\cdot}494, \quad \lambda_1$$

$$x_3 + x_4 + x_5 + x_6 = e_2 = -0{\cdot}234, \quad \lambda_2$$

$$x_5 + x_6 + x_7 + x_8 = e_3 = +0{\cdot}424, \quad \lambda_3$$

$$\left.\begin{matrix} -18\,x_1 & +2\,x_2 & -16\,x_3 \\ +19\,x_6 & -2\,x_7 & +15\,x_8 \end{matrix}\right\} = e_4 = +5{\cdot}9, \quad \lambda_4$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 0·494	+0·23	+0·13	...	− 1·76
2	− 0·234		+0·24	+0·11	− 0·20
3	+ 0·424		*	+0·34	+ 3·36
4	+ 5·9				+86·90

Values of the Factors

$\lambda_1 = -2{\cdot}1178$

$\lambda_2 = -0{\cdot}8312$

$\lambda_3 = +2{\cdot}0842$

$\lambda_4 = -0{\cdot}0575$

Angular errors in seconds

$x_1 = -{\cdot}054$	$x_5 = +{\cdot}088$
$x_2 = -{\cdot}112$	$x_6 = +{\cdot}006$
$x_3 = -{\cdot}122$	$x_7 = +{\cdot}110$
$x_4 = -{\cdot}206$	$x_8 = +{\cdot}220$

$[wx^2] = 1{\cdot}79$

* In the tables of the equations between the factors the co-efficients of the terms below the diagonal are omitted for convenience, the co-efficient of the *pth* term in the *qth* line being always the same as the co-efficient of the *qth* term in the *pth* line.

Figure No. 40.

Observed Angles

No.	Value	Reciprocal Weight
	° ′ ″	
1	36 56 14·26	·05
2	39 2 54·34	·04
3	51 27 43·67	·08
4	52 33 10·45	·08
5	41 58 16·61	·14
6	34 0 51·63	·08
7	47 44 50·65	·08
8	56 16 4·05	·07

Equations to be satisfied

					Factor
x_1	$+x_2$	$+x_3$	$+x_4$	$= e_1 = +\ 0{\cdot}002,$	λ_1
x_3	$+x_4$	$+x_5$	$+x_6$	$= e_2 = -\ 0{\cdot}508,$	λ_2
x_5	$+x_6$	$+x_7$	$+x_8$	$= e_3 = -\ 0{\cdot}261,$	λ_3
	$-28\,x_1$ $+27\,x_6$	$+0\,x_2$ $-4\,x_7$	$-17\,x_3$ $+14\,x_8$	$= e_4 = -\ 5{\cdot}2,$	λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	+ 0·002	+0·25	+0·16	...	− 2·76
2	− 0·508		+0·38	+0·22	+ 0·80
3	− 0·261		*	+0·37	+ 2·82
4	− 5·2				+135·64

Values of the Factors

$\lambda_1 = +\ 1{\cdot}3536$

$\lambda_2 = -\ 2{\cdot}3321$

$\lambda_3 = +\ 0{\cdot}7827$

$\lambda_4 = -\ 0{\cdot}0133$

Angular errors in seconds

$x_1 = +\ {\cdot}086$	$x_5 = -\ {\cdot}217$
$x_2 = +\ {\cdot}054$	$x_6 = -\ {\cdot}153$
$x_3 = -\ {\cdot}060$	$x_7 = +\ {\cdot}067$
$x_4 = -\ {\cdot}078$	$x_8 = +\ {\cdot}042$

$[wx^2] = 1{\cdot}05$

Figure No. 41.

Observed Angles

No.	°	′	″	Reciprocal Weight
1	72	25	50·79	·09
2	65	3	37·80	·06
3	42	30	32·24	·07
4	96	44	28·68	·07
5	29	23	54·47	·14
6	53	51	38·45	·06
7	87	29	28·27	·13
8	40	4	34·36	·09
9	52	25	58·11	·15
10	59	52	9·39	·12
11	78	12	53·69	·16
12	41	54	57·45	·04
13	43	28	2·90	·09
14	70	23	34·72	·04
15	66	8	23·40	·16

Equations to be satisfied — **Factor**

$x_1 + x_2 + x_3 \;\ldots\;\ldots = e_1 = -0·842,\quad \lambda_1$

$x_4 + x_5 + x_6 \;\ldots\;\ldots = e_2 = +0·180,\quad \lambda_2$

$x_7 + x_8 + x_9 \;\ldots\;\ldots = e_3 = +0·035,\quad \lambda_3$

$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots = e_4 = -0·197,\quad \lambda_4$

$x_{13} + x_{14} + x_{15} \;\ldots\;\ldots = e_5 = +0·147,\quad \lambda_5$

$x_1 + x_4 + x_7 + x_{10} + x_{13} = e_6 = +0·03,\quad \lambda_6$

$\left.\begin{array}{l} 23x_3 - 10x_2 + 15x_6 - 37x_5 + 16x_9 \\ -25x_8 + 24x_{12} - 4x_{11} + 10x_{15} - 7x_{14} \end{array}\right\} = e_7 = -17·7,\quad \lambda_7$

Equations between the Factors

No. of e	Value of e	λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7
1	− 0·842	+0·22	...	...	...	...	+0·09	+ 1·01
2	+ 0·180		+0·27	...	...	...	+0·07	− 4·28
3	+ 0·035			+0·37	...	...	+0·13	+ 0·15
4	− 0·197				+0·32	...	+0·12	+ 0·32
5	+ 0·147					+0·29	+0·09	+ 1·32
6	+ 0·03			*			+0·50	...
7	−17·7							+386·40

Values of the Factors

$\lambda_1 = -4·0904$
$\lambda_2 = -0·2070$
$\lambda_3 = -0·2647$
$\lambda_4 = -0·9777$
$\lambda_5 = +0·3476$
$\lambda_6 = +1·0660$
$\lambda_7 = -0·0377$

Angular errors in seconds

$x_1 = -·272$	$x_6 = -·046$	$x_{11} = -·132$
$x_2 = -·223$	$x_7 = +·104$	$x_{12} = -·076$
$x_3 = -·347$	$x_8 = +·061$	$x_{13} = +·127$
$x_4 = +·060$	$x_9 = -·130$	$x_{14} = +·025$
$x_5 = +·166$	$x_{10} = +·011$	$x_{15} = -·005$

$[wx^2] = 4·34$

Figure No. 42.

Observed Angles

No.	°	′	″	Reciprocal Weight
1	44	37	33·74	·11
2	63	9	55·46	·07
3	72	12	32·95	·10
4	65	19	3·97	·08
5	66	14	26·70	·10
6	48	26	30·75	·11
7	55	43	57·28	·06
8	46	3	24·80	·08
9	78	12	41·48	·12
10	48	14	1·70	·14
11	61	13	3·82	·13
12	70	32	55·51	·05
13	43	20	16·93	·09
14	76	19	51·23	·07
15	60	19	53·87	·12
16	45	51	51·10	·10
17	70	21	37·33	·08
18	63	46	33·27	·18
19	56	53	15·03	·09
20	65	57	0·60	·27
21	57	9	45·75	·18

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 \; \ldots \; \ldots \; \ldots \; \ldots = e_1 = +\ 0{\cdot}479,$	λ_1
$x_4 + x_5 + x_6 \; \ldots \; \ldots \; \ldots \; \ldots = e_2 = -\ 1{\cdot}057,$	λ_2
$x_7 + x_8 + x_9 \; \ldots \; \ldots \; \ldots \; \ldots = e_3 = +\ 1{\cdot}533,$	λ_3
$x_{10} + x_{11} + x_{12} \; \ldots \; \ldots \; \ldots \; \ldots = e_4 = -\ 0{\cdot}221,$	λ_4
$x_{13} + x_{14} + x_{15} \; \ldots \; \ldots \; \ldots \; \ldots = e_5 = +\ 0{\cdot}834,$	λ_5
$x_{16} + x_{17} + x_{18} \; \ldots \; \ldots \; \ldots \; \ldots = e_6 = +\ 0{\cdot}231,$	λ_6
$x_{19} + x_{20} + x_{21} \; \ldots \; \ldots \; \ldots \; \ldots = e_7 = -\ 0{\cdot}576,$	λ_7
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} + x_{19} = e_8 = -\ 0{\cdot}25,$	λ_8
$\left.\begin{matrix} 7x_3 - 10x_2 + 19x_6 - 9x_5 + 5x_9 - 20x_8 + 7x_{12} \\ -12x_{11} + 12x_{15} - 5x_{14} + 10x_{18} - 8x_{17} + 14x_{21} - 9x_{20} \end{matrix}\right\} = e_9 = +38{\cdot}4,$	λ_9

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9
1	+ 0·479	+0·28	...	...	...	...	...	...	+0·11	0·00
2	− 1·057		+0·29	...	...	...	...	...	+0·08	+ 1·19
3	+ 1·533			+0·26	...	...	...	...	+0·06	− 1·00
4	− 0·221				+0·32	...	...	...	+0·14	− 1·21
5	+ 0·834					+0·28	...	...	+0·09	+ 1·09
6	+ 0·231				*		+0·36	...	+0·10	+ 1·16
7	− 0·576							+0·54	+0·09	+ 0·09
8	− 0·25								+0·67	...
9	+38·4									+215·18

Values of the Factors

$\lambda_1 = +\ 2{\cdot}2104$
$\lambda_2 = -\ 4{\cdot}2163$
$\lambda_3 = +\ 7{\cdot}0542$
$\lambda_4 = +\ 0{\cdot}7158$
$\lambda_5 = +\ 2{\cdot}5124$
$\lambda_6 = +\ 0{\cdot}2708$
$\lambda_7 = -\ 0{\cdot}8921$
$\lambda_8 = -\ 1{\cdot}2720$
$\lambda_9 = +\ 0{\cdot}2248$

Angular errors in seconds

$x_1 = +\ {\cdot}103$	$x_8 = +\ {\cdot}205$	$x_{15} = +\ {\cdot}625$
$x_2 = -\ {\cdot}003$	$x_9 = +\ {\cdot}981$	$x_{16} = -\ {\cdot}100$
$x_3 = +\ {\cdot}379$	$x_{10} = -\ {\cdot}078$	$x_{17} = -\ {\cdot}122$
$x_4 = -\ {\cdot}439$	$x_{11} = -\ {\cdot}258$	$x_{18} = +\ {\cdot}453$
$x_5 = -\ {\cdot}624$	$x_{12} = +\ {\cdot}115$	$x_{19} = -\ {\cdot}195$
$x_6 = +\ {\cdot}006$	$x_{13} = +\ {\cdot}112$	$x_{20} = -\ {\cdot}787$
$x_7 = +\ {\cdot}347$	$x_{14} = +\ {\cdot}097$	$x_{21} = +\ {\cdot}406$

$[wx^2] = 27{\cdot}80$

Figure No. 43.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	48	8	42·23	·04
2	56	42	39·27	·12
3	75	8	40·00	·08
4	51	32	20·30	·12
5	82	0	56·77	·09
6	46	26	45·66	·04
7	51	58	22·70	·17
8	44	52	47·96	·07
9	83	8	49·21	·17
10	65	22	46·05	·07
11	62	51	42·99	·12
12	51	45	34·11	·10
13	68	5	24·82	·06
14	50	4	44·28	·08
15	61	49	52·24	·11
16	74	52	23·49	·04
17	59	34	36·00	·06
18	45	33	1·60	·05

Equations to be satisfied — **Factor**

$$x_1 + x_2 + x_3 = e_1 = +0{\cdot}276, \qquad \lambda_1$$
$$x_4 + x_5 + x_6 = e_2 = +1{\cdot}209, \qquad \lambda_2$$
$$x_7 + x_8 + x_9 = e_3 = -1{\cdot}616, \qquad \lambda_3$$
$$x_{10} + x_{11} + x_{12} = e_4 = +1{\cdot}769, \qquad \lambda_4$$
$$x_{13} + x_{14} + x_{15} = e_5 = -0{\cdot}049, \qquad \lambda_5$$
$$x_{16} + x_{17} + x_{18} = e_6 = -0{\cdot}429, \qquad \lambda_6$$
$$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -0{\cdot}41, \qquad \lambda_7$$
$$\left.\begin{array}{l} 6x_3 - 14x_2 + 20x_6 - 3x_5 + 2x_9 - 21x_8 \\ +17x_{12} - 11x_{11} + 11x_{15} - 17x_{14} + 21x_{18} - 13x_{17} \end{array}\right\} = e_8 = -8{\cdot}1, \qquad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+0·276	+0·24	...	...	...	...	...	+0·04	−1·20
2	+1·209		+0·25	...	...	...	...	+0·12	+0·53
3	−1·616			+0·41	...	...	...	+0·17	−1·13
4	+1·769				+0·29	...	...	+0·07	+0·38
5	−0·049					+0·25	...	+0·06	−0·15
6	−0·429			*			+0·15	+0·04	+0·27
7	−0·41							+0·50	...
8	−8·1								+186·80

Values of the Factors

$\lambda_1 = +1{\cdot}0616$
$\lambda_2 = +5{\cdot}9692$
$\lambda_3 = -3{\cdot}3480$
$\lambda_4 = +6{\cdot}6903$
$\lambda_5 = +0{\cdot}2311$
$\lambda_6 = -2{\cdot}1782$
$\lambda_7 = -1{\cdot}9896$
$\lambda_8 = -0{\cdot}0840$

Angular errors in seconds

$x_1 = -{\cdot}037$	$x_7 = -{\cdot}907$	$x_{13} = -{\cdot}106$
$x_2 = +{\cdot}268$	$x_8 = -{\cdot}111$	$x_{14} = +{\cdot}133$
$x_3 = +{\cdot}045$	$x_9 = -{\cdot}598$	$x_{15} = -{\cdot}076$
$x_4 = +{\cdot}478$	$x_{10} = +{\cdot}329$	$x_{16} = -{\cdot}167$
$x_5 = +{\cdot}560$	$x_{11} = +{\cdot}914$	$x_{17} = -{\cdot}065$
$x_6 = +{\cdot}171$	$x_{12} = +{\cdot}526$	$x_{18} = -{\cdot}197$

$[wx^2] = 27{\cdot}18$

Figure No. 44.

Observed Angles

No.	Value	Reciprocal Weight	No.	Value	Reciprocal Weight	No.	Value	Reciprocal Weight
	° ′ ″			° ′ ″			° ′ ″	
1	57 45 13·00	·04	11	65 11 3·90	·11	21	48 30 50·23	·28
2	58 44 44·98	·14	12	79 20 46·49	·14	22	84 18 20·45	·09
3	63 30 3·93	·07	13	71 33 34·62	·20	23	47 32 9·15	·18
4	62 6 26·31	·09	14	39 51 3·47	·13	24	48 9 31·65	·07
5	62 56 28·59	·09	15	68 35 23·73	·06	25	34 46 10·67	·10
6	54 57 6·26	·17	16	69 18 48·17	·07	26	79 45 55·79	·03
7	63 47 46·15	·06	17	62 32 35·84	·09	27	65 27 54·30	·06
8	68 56 50·65	·18	18	48 8 37·33	·08	28	47 48 6·71	·08
9	47 15 27·92	·07	19	73 55 32·39	·05	29	83 25 14·36	·13
10	35 28 11·72	·13	20	57 33 39·74	·06	30	48 46 40·91	·05

Equations to be satisfied — **Factor**

Equation	Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots \ldots = e_1 = +\ 0·285,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots \ldots = e_2 = -\ 0·604,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots \ldots \ldots = e_3 = +\ 2·244,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots \ldots = e_4 = +\ 0·231,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots \ldots = e_5 = -\ 0·133,$	λ_5
$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots \ldots = e_6 = -\ 0·239,$	λ_6
$x_{19} + x_{20} + x_{21} \ldots \ldots \ldots \ldots = e_7 = +\ 1·036,$	λ_7
$x_{22} + x_{23} + x_{24} \ldots \ldots \ldots \ldots = e_8 = -\ 0·279,$	λ_8
$x_{25} + x_{26} + x_{27} \ldots \ldots \ldots \ldots = e_9 = -\ 0·179,$	λ_9
$x_{28} + x_{29} + x_{30} \ldots \ldots \ldots \ldots = e_{10} = +\ 0·238,$	λ_{10}
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} \ldots = e_{11} = -\ 0·03,$	λ_{11}
$x_{12} + x_{19} + x_{22} + x_{25} + x_{28} + x_{14} \ldots = e_{12} = +\ 0·18,$	λ_{12}
$11x_3 - 13x_2 + 15x_6 - 10x_5 + 19x_9 - 8x_8 + 4x_{12} - 10x_{11} + 8x_{15} - 26x_{14} + 19x_{18} - 11x_{17} \ldots = e_{13} = -\ 59·2,$	λ_{13}
$10x_{11} - 30x_{10} + 19x_{21} - 13x_{20} + 18x_{24} - 19x_{23} + 10x_{27} - 4x_{26} + 18x_{30} - 2x_{29} + 7x_{13} - 8x_{15} \ldots = e_{14} = +\ 18·8,$	λ_{14}

Figure No. 44.—(Continued).

Equations between the Factors

No. of e	Value of e	Co-efficients of													
		λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}	λ_{11}	λ_{12}	λ_{13}	λ_{14}
1	+ 0·285	+0·25	...	...	...	...	...	...	...	...	...	+0·04	...	− 1·05	...
2	− 0·604		+0·35	...	...	...	...	...	...	...	...	+0·09	...	+ 1·65	...
3	+ 2·244			+0·31	...	...	...	...	...	...	...	+0·06	...	− 0·11	...
4	+ 0·231				+0·38	...	...	...	...	...	...	+0·13	+0·14	− 0·54	− 2·80
5	− 0·133					+0·39	...	...	...	...	...	+0·20	+0·13	− 2·90	+ 0·92
6	− 0·239						+0·24	...	...	...	...	+0·07	...	+ 0·53	...
7	+ 1·036							+0·39	...	...	...	...	+0·05	...	+ 4·54
8	− 0·279								+0·34	...	...	...	+0·09	...	− 2·16
9	− 0·179									+0·19	...	...	+0·10	...	+ 0·48
10	+ 0·238							*			+0·26	...	+0·08	...	+ 0·64
11	− 0·03											+0·59	...	...	− 2.50
12	+ 0·18												+0·59	− 2·82	...
13	−59·2													+260·90	− 14·84
14	+18·8														+363·72

Values of the Factors

$\lambda_1 = +\ 0·1234$

$\lambda_2 = -\ 0·5312$

$\lambda_3 = +\ 7·1748$

$\lambda_4 = +\ 0·7127$

$\lambda_5 = -\ 1·8672$

$\lambda_6 = -\ 0·4154$

$\lambda_7 = +\ 2·5979$

$\lambda_8 = -\ 0·5084$

$\lambda_9 = -\ 0·5373$

$\lambda_{10} = +\ 1·1380$

$\lambda_{11} = -\ 0·1223$

$\lambda_{12} = -\ 0·8375$

$\lambda_{13} = -\ 0·2467$

$\lambda_{14} = +\ 0·0143$

Angular errors in seconds

$x_1 =$ ·000	$x_{11} = +$ ·366	$x_{21} = +$ ·803
$x_2 = +$ ·466	$x_{12} = -$ ·156	$x_{22} = -$ ·121
$x_3 = -$ ·181	$x_{13} = -$ ·378	$x_{23} = -$ ·140
$x_4 = -$ ·058	$x_{14} = +$ ·482	$x_{24} = -$ ·018
$x_5 = +$ ·174	$x_{15} = -$ ·237	$x_{25} = -$ ·137
$x_6 = -$ ·720	$x_{16} = -$ ·038	$x_{26} = -$ ·018
$x_7 = +$ ·423	$x_{17} = +$ ·207	$x_{27} = -$ ·024
$x_8 = +$ 1·647	$x_{18} = -$ ·408	$x_{28} = +$ ·024
$x_9 = +$ ·174	$x_{19} = +$ ·088	$x_{29} = +$ ·144
$x_{10} = +$ ·021	$x_{20} = +$ ·145	$x_{30} = +$ ·070

$[wx^2] = 34·89$

Figure No. 45.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	66	32	2·73	·07
2	51	50	38·41	·06
3	61	37	20·75	·14
4	67	48	57·03	·07
5	68	49	12·48	·26
6	43	21	53·51	·07
7	65	15	34·22	·09
8	55	59	23·59	·13
9	58	45	7·31	·13
10	53	35	17·22	·05
11	54	51	16·87	·08
12	71	33	27·46	·03
13	59	20	47·07	·10
14	63	49	49·99	·04
15	56	49	25·56	·08
16	47	27	21·65	·09
17	60	48	55·06	·08
18	71	43	44·61	·03

Equations to be satisfied

Equations to be satisfied	Factor
$x_1 + x_2 + x_3 \;\ldots\;\ldots\;\ldots = e_1 = -\,0·198,$	λ_1
$x_4 + x_5 + x_6 \;\ldots\;\ldots\;\ldots = e_2 = +\,0·462,$	λ_2
$x_7 + x_8 + x_9 \;\ldots\;\ldots\;\ldots = e_3 = +\,1·816,$	λ_3
$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots\;\ldots = e_4 = -\,0·897,$	λ_4
$x_{13} + x_{14} + x_{15} \;\ldots\;\ldots\;\ldots = e_5 = +\,0·203,$	λ_5
$x_{16} + x_{17} + x_{18} \;\ldots\;\ldots\;\ldots = e_6 = -\,0·721,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -\,0·08,$	λ_7
$\left.\begin{array}{l} 12x_3 - 16x_2 + 22x_6 - 8x_5 + 13x_9 - 15x_8 \\ +\,7x_{12} - 15x_{11} + 14x_{15} - 10x_{14} + 7x_{18} - 12x_{17} \end{array}\right\} = e_8 = +21·5,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·198	+0·27	...	...	...	...	...	+0·07	+ 0·72
2	+ 0·462		+0·40	...	...	...	...	+0·07	− 0·54
3	+ 1·816			+0·35	...	...	...	+0·09	− 0·26
4	− 0·897				+0·16	...	...	+0·05	− 0·99
5	+ 0·203					+0·22	...	+0·10	+ 0·72
6	− 0·721			*			+0·20	+0·09	− 0·75
7	− 0·08							+0·47	...
8	+21·5								+189·40

Values of the Factors

$\lambda_1 = -\,0·8904$
$\lambda_2 = +\,1·3216$
$\lambda_3 = +\,5·3259$
$\lambda_4 = -\,4·9821$
$\lambda_5 = +\,0·7687$
$\lambda_6 = -\,3·1527$
$\lambda_7 = -\,0·2841$
$\lambda_8 = +\,0·0865$

Angular errors in seconds

$x_1 = -\,·082$	$x_7 = +\,·454$	$x_{13} = +\,·049$
$x_2 = -\,·137$	$x_8 = +\,·523$	$x_{14} = -\,·004$
$x_3 = +\,·021$	$x_9 = +\,·839$	$x_{15} = +\,·158$
$x_4 = +\,·072$	$x_{10} = -\,·264$	$x_{16} = -\,·309$
$x_5 = +\,·164$	$x_{11} = -\,·502$	$x_{17} = -\,·335$
$x_6 = +\,·226$	$x_{12} = -\,·131$	$x_{18} = -\,·077$

$[wx^2] = 19·24$

Figure No. 46.

Observed Angles

No.	Value	Reciprocal Weight	No.	Value	Reciprocal Weight	No.	Value	Reciprocal Weight
	° ′ ″			° ′ ″			° ′ ″	
1	67 3 38·96	·07	11	77 55 44·22	·10	21	56 26 43·77	·06
2	67 54 55·94	·12	12	61 36 49·71	·16	22	73 58 6·66	·08
3	45 1 26·41	·10	13	77 8 9·91	·03	23	63 9 33·86	·05
4	51 31 23·74	·14	14	47 22 28·46	·15	24	42 52 20·39	·11
5	54 11 39·80	·18	15	55 29 22·75	·03	25	55 27 1·35	·09
6	74 16 58·84	·12	16	62 3 24·57	·05	26	43 54 20·81	·11
7	61 45 55·58	·10	17	56 11 58·56	·11	27	80 38 39·59	·12
8	57 32 46·89	·10	18	61 44 38·36	·18	28	68 53 5·31	·06
9	60 41 19·33	·06	19	52 42 28·49	·05	29	76 23 47·82	·05
10	40 27 27·18	·06	20	70 50 48·41	·06	30	34 43 8·12	·11

Equations to be satisfied

Equations to be satisfied								Factor
x_1	$+x_2$	$+x_3$	...	...	...	...	$= e_1 = -\ 0{\cdot}497,$	λ_1
x_4	$+x_5$	$+x_6$	...	...	...	...	$= e_2 = +\ 0{\cdot}685,$	λ_2
x_7	$+x_8$	$+x_9$	...	...	...	...	$= e_3 = +\ 0{\cdot}245,$	λ_3
x_{10}	$+x_{11}$	$+x_{12}$	...	...	...	...	$= e_4 = -\ 0{\cdot}122,$	λ_4
x_{13}	$+x_{14}$	$+x_{15}$	...	...	...	...	$= e_5 = -\ 0{\cdot}717,$	λ_5
x_{16}	$+x_{17}$	$+x_{18}$	...	...	...	...	$= e_6 = +\ 0{\cdot}087,$	λ_6
x_{19}	$+x_{20}$	$+x_{21}$	...	...	...	...	$= e_7 = -\ 0{\cdot}168,$	λ_7
x_{22}	$+x_{23}$	$+x_{24}$	...	...	...	...	$= e_8 = -\ 0{\cdot}595,$	λ_8
x_{25}	$+x_{26}$	$+x_{27}$	...	...	...	...	$= e_9 = +\ 0{\cdot}561,$	λ_9
x_{28}	$+x_{29}$	$+x_{30}$	...	...	...	...	$= e_{10} = -\ 0{\cdot}365,$	λ_{10}
x_1	$+x_4$	$+x_7$	$+x_{10}$	$+x_{13}$	$+x_{16}$	...	$= e_{11} = -\ 0{\cdot}06,$	λ_{11}
x_{12}	$+x_{19}$	$+x_{22}$	$+x_{25}$	$+x_{28}$	$+x_{14}$	...	$= e_{12} = -\ 0{\cdot}02,$	λ_{12}
$21\,x_3$	$-\ 9\,x_2$	$+\ 6\,x_6$	$-16\,x_5$	$+12\,x_9$	$-13\,x_8$	...	$= e_{13} = +\ 18{\cdot}5,$	λ_{13}
$+11\,x_{12}$	$-\ 5\,x_{11}$	$+15\,x_{15}$	$-19\,x_{14}$	$+12\,x_{18}$	$-14\,x_{17}$			
$5\,x_{11}$	$-24\,x_{10}$	$+14\,x_{21}$	$-\ 8\,x_{20}$	$+23\,x_{24}$	$-11\,x_{23}$	...	$= e_{14} = +\ 3{\cdot}6,$	λ_{14}
$+\ 4\,x_{27}$	$-22\,x_{26}$	$+31\,x_{30}$	$-\ 5\,x_{29}$	$+\ 5\,x_{13}$	$-15\,x_{15}$			

Figure No. 46.—(Continued).

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}	λ_{11}	λ_{12}	λ_{13}	λ_{14}
1	− 0·497	+0·29	...	...	...	...	...	...	...	...	...	+0·07	...	+ 1·02	...
2	+ 0·685		+0·44	...	...	...	...	...	...	...	...	+0·14	...	− 2·16	...
3	+ 0·245			+0·26	...	...	...	...	...	...	...	+0·10	...	− 0·58	...
4	− 0·122				+0·32	...	...	...	...	...	...	+0·06	+0·16	+ 1·26	− 0·94
5	− 0·717					+0·21	...	...	...	...	...	+0·03	+0·15	− 2·40	− 0·30
6	+ 0·087						+0·34	...	...	...	...	+0·05	...	+ 0·62	...
7	− 0·168							+0·17	...	...	...	...	+0·05	...	+ 0·36
8	− 0·595								+0·24	...	...	...	+0·08	...	+ 1·98
9	+ 0·561									+0·32	...	...	+0·09	...	− 1·94
10	− 0·365						*				+0·22	...	+0·06	...	+ 3·16
11	− 0·06											+0·45	...	...	− 1·29
12	− 0·02												+0·59	− 1·09	...
13	+18·5													+260·00	− 9·25
14	+ 3·6														+286·52

Values of the Factors

$\lambda_1 = -\ 2·0142$
$\lambda_2 = +\ 1·9308$
$\lambda_3 = +\ 1·0957$
$\lambda_4 = -\ 1·6812$
$\lambda_5 = -\ 4·1238$
$\lambda_6 = +\ 0·0986$
$\lambda_7 = -\ 1·8875$
$\lambda_8 = -\ 3·9991$
$\lambda_9 = +\ 1·5853$
$\lambda_{10} = -\ 3·5543$
$\lambda_{11} = +\ 0·0692$
$\lambda_{12} = +\ 2·4414$
$\lambda_{13} = +\ 0·0807$
$\lambda_{14} = +\ 0·0856$

Angular errors in seconds

$x_1 = -$ ·136	$x_{11} = -$ ·166	$x_{21} = -$ ·042
$x_2 = -$ ·329	$x_{12} = +$ ·264	$x_{22} = -$ ·125
$x_3 = -$ ·032	$x_{13} = -$ ·109	$x_{23} = -$ ·247
$x_4 = +$ ·280	$x_{14} = -$ ·482	$x_{24} = -$ ·223
$x_5 = +$ ·115	$x_{15} = -$ ·126	$x_{25} = +$ ·362
$x_6 = +$ ·290	$x_{16} = +$ ·008	$x_{26} = -$ ·033
$x_7 = +$ ·117	$x_{17} = -$ ·113	$x_{27} = +$ ·232
$x_8 = +$ ·004	$x_{18} = +$ ·192	$x_{28} = -$ ·067
$x_9 = +$ ·124	$x_{19} = +$ ·028	$x_{29} = -$ ·199
$x_{10} = -$ ·220	$x_{20} = -$ ·154	$x_{30} = -$ ·099

$[wx^2] = 12·40$

Figure No. 47.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	55	54	41·73	·06
2	71	21	19·69	·08
3	52	44	2·16	·05
4	36	48	10·14	·12
5	73	15	46·37	·06
6	69	56	4·43	·04
7	62	51	25·77	·15
8	59	3	36·06	·06
9	58	4	58·98	·06
10	72	56	19·38	·17
11	54	55	31·66	·24
12	52	8	14·26	·06
13	45	27	41·02	·09
14	66	0	49·82	·04
15	68	31	31·59	·06
16	37	2	52·21	·08
17	70	47	19·93	·05
18	72	9	50·24	·09
19	48	58	49·74	·03
20	52	21	10·21	·04
21	78	40	2·34	·06

Equations to be satisfied — Factor

Equation		Factor
$x_1 + x_2 + x_3$	$= e_1 = + 1·410,$	λ_1
$x_4 + x_5 + x_6$	$= e_2 = - 0·965,$	λ_2
$x_7 + x_8 + x_9$	$= e_3 = - 2·106,$	λ_3
$x_{10} + x_{11} + x_{12}$	$= e_4 = + 2·019,$	λ_4
$x_{13} + x_{14} + x_{15}$	$= e_5 = - 0·060,$	λ_5
$x_{16} + x_{17} + x_{18}$	$= e_6 = + 0·330,$	λ_6
$x_{19} + x_{20} + x_{21}$	$= e_7 = + 0·234,$	λ_7
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} + x_{19}$	$= e_8 = - 0·01,$	λ_8
$\left.\begin{matrix} 16x_3 - 7x_2 + 7x_6 - 6x_5 + 13x_9 - 12x_8 + 17x_{12} \\ -15x_{11} + 8x_{15} - 10x_{14} + 7x_{18} - 8x_{17} + 5x_{21} - 16x_{20} \end{matrix}\right\}$	$= e_9 = -34·3,$	λ_9

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9
1	+ 1·410	+0·19	...	...	...	...	...	...	+0·06	+ 0·24
2	− 0·965		+0·22	...	...	...	...	...	+0·12	− 0·08
3	− 2·106			+0·27	...	...	...	...	+0·15	+ 0·06
4	+ 2·019				+0·47	...	...	...	+0·17	− 2·58
5	− 0·060					+0·19	...	...	+0·09	+ 0·08
6	+ 0·330				*		+0·22	...	+0·08	+ 0·23
7	+ 0·234							+0·13	+0·03	− 0·34
8	− 0·01								+0·70	...
9	−34·3									+138·15

Values of the Factors

$\lambda_1 = + 7·2528$

$\lambda_2 = - 5·2115$

$\lambda_3 = - 8·5160$

$\lambda_4 = + 2·6464$

$\lambda_5 = - 0·8777$

$\lambda_6 = + 1·2203$

$\lambda_7 = + 0·9339$

$\lambda_8 = + 1·3729$

$\lambda_9 = - 0·2100$

Angular errors in seconds

$x_1 = + ·517$	$x_8 = - ·360$	$x_{15} = - ·154$
$x_2 = + ·698$	$x_9 = - ·675$	$x_{16} = + ·208$
$x_3 = + ·195$	$x_{10} = + ·683$	$x_{17} = + ·145$
$x_4 = - ·461$	$x_{11} = +1·391$	$x_{18} = - ·023$
$x_5 = - ·237$	$x_{12} = - ·055$	$x_{19} = + ·069$
$x_6 = - ·267$	$x_{13} = + ·045$	$x_{20} = + ·172$
$x_7 = -1·071$	$x_{14} = + ·049$	$x_{21} = - ·007$

$[wx^2] = 46·40$

Figure No. 48.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	55	36	57·51	·11
2	45	11	36·23	·08
3	79	11	27·65	·17
4	49	38	58·96	·19
5	67	11	9·48	·20
6	63	9	53·69	·20
7	59	57	0·41	·17
8	48	20	9·24	·25
9	71	42	50·76	·20
10	65	24	38·46	·16
11	59	19	58·62	·19
12	55	15	25·44	·11
13	77	36	23·71	·06
14	54	50	51·06	·22
15	47	32	47·41	·12
16	51	46	0·47	·09
17	85	28	45·17	·28
18	42	45	15·60	·24

Equations to be satisfied

Equation		Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots$	$= e_1 = -0·914,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots$	$= e_2 = +0·542,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots \ldots$	$= e_3 = -1·056,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots$	$= e_4 = +1·252,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots$	$= e_5 = +0·600,$	λ_5
$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots$	$= e_6 = -0·828,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16}$	$= e_7 = -0·48,$	λ_7
$\left.\begin{array}{l} 4x_3 - 21x_2 + 11x_6 - 9x_5 + 7x_9 - 18x_8 \\ + 14x_{12} - 12x_{11} + 19x_{15} - 14x_{14} + 23x_{18} - 2x_{17} \end{array}\right\}$	$= e_8 = -7·4,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	−0·914	+0·36	...	...	...	...	...	+0·11	− 1·00
2	+0·542		+0·59	...	...	...	...	+0·19	+ 0·40
3	−1·056			+0·62	...	...	...	+0·17	− 3·10
4	+1·252				+0·46	...	...	+0·16	− 0·74
5	+0·600					+0·40	...	+0·06	− 0·80
6	−0·828			*			+0·61	+0·09	+ 4·96
7	−0·48							+0·78	...
8	−7·4								+432·64

Values of the Factors

$\lambda_1 = -2·3153$
$\lambda_2 = +1·2035$
$\lambda_3 = -1·5368$
$\lambda_4 = +2·9975$
$\lambda_5 = +1·6011$
$\lambda_6 = -1·1201$
$\lambda_7 = -0·8560$
$\lambda_8 = -0·0137$

Angular errors in seconds

$x_1 = -·349$	$x_7 = -·407$	$x_{13} = +·045$
$x_2 = -·162$	$x_8 = -·323$	$x_{14} = +·394$
$x_3 = -·403$	$x_9 = -·326$	$x_{15} = +·161$
$x_4 = +·066$	$x_{10} = +·343$	$x_{16} = -·178$
$x_5 = +·265$	$x_{11} = +·601$	$x_{17} = -·306$
$x_6 = +·211$	$x_{12} = +·308$	$x_{18} = -·344$

$[wx^2] = 10·54$

Figure No. 49.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	46	18	37·96	·33
2	88	19	5·37	·29
3	45	22	17·72	·28
4	54	27	55·98	·20
5	43	45	23·96	·07
6	81	46	42·66	·36
7	76	53	2·27	·19
8	49	6	48·64	·12
9	54	0	9·73	·10
10	60	34	59·98	·10
11	71	22	0·33	·16
12	48	3	0·55	·08
13	41	29	29·89	·19
14	71	30	12·07	·21
15	67	0	19·27	·06
16	80	15	53·59	·23
17	43	36	29·85	·17
18	56	7	38·69	·21

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3$ ... ... $= e_1 = -0{\cdot}555,$	λ_1
$x_4 + x_5 + x_6$ ... ... $= e_2 = +0{\cdot}827,$	λ_2
$x_7 + x_8 + x_9$ ... ... $= e_3 = -0{\cdot}745,$	λ_3
$x_{10} + x_{11} + x_{12}$ ... ... $= e_4 = -0{\cdot}615,$	λ_4
$x_{13} + x_{14} + x_{15}$ ... ... $= e_5 = -0{\cdot}243,$	λ_5
$x_{16} + x_{17} + x_{18}$ ... ... $= e_6 = +0{\cdot}255,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -0{\cdot}33,$	λ_7
$\left.\begin{array}{l} 21x_3 - 0x_2 + 3x_6 - 22x_5 + 15x_9 - 19x_8 \\ +19x_{12} - 7x_{11} + 9x_{15} - 7x_{14} + 14x_{18} - 22x_{17} \end{array}\right\} = e_8 = +20{\cdot}6,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·555	+0·90	...	...	...	...	...	+0·33	+ 5·88
2	+ 0·827		+0·63	...	...	...	...	+0·20	− 0·46
3	− 0·745			+0·41	...	...	...	+0·19	− 0·78
4	− 0·615				+0·34	...	...	+0·10	+ 0·40
5	− 0·243					+0·46	...	+0·19	− 0·93
6	+ 0·255			*			+0·61	+0·23	− 0·80
7	− 0·33							+1·24	...
8	+20·6								+401·73

Values of the Factors

$\lambda_1 = -1{\cdot}1614$
$\lambda_2 = +1{\cdot}2741$
$\lambda_3 = -1{\cdot}8167$
$\lambda_4 = -1{\cdot}9702$
$\lambda_5 = -0{\cdot}5058$
$\lambda_6 = +0{\cdot}4023$
$\lambda_7 = +0{\cdot}2776$
$\lambda_8 = +0{\cdot}0678$

Angular errors in seconds

$x_1 = -{\cdot}292$	$x_7 = -{\cdot}292$	$x_{13} = -{\cdot}043$
$x_2 = -{\cdot}337$	$x_8 = -{\cdot}373$	$x_{14} = -{\cdot}206$
$x_3 = +{\cdot}074$	$x_9 = -{\cdot}080$	$x_{15} = +{\cdot}006$
$x_4 = +{\cdot}310$	$x_{10} = -{\cdot}169$	$x_{16} = +{\cdot}156$
$x_5 = -{\cdot}015$	$x_{11} = -{\cdot}391$	$x_{17} = -{\cdot}185$
$x_6 = +{\cdot}532$	$x_{12} = -{\cdot}055$	$x_{18} = +{\cdot}284$

$[wx^2] = 5{\cdot}80$

Figure No. 50.

Observed Angles

No.	Value	Reciprocal Weight
	° ′ ″	
1	33 0 10·17	·04
2	51 20 49·19	·21
3	61 38 20·01	·22
4	34 0 42·13	·04
5	35 51 1·35	·12
6	48 29 58·19	·38
7	52 38 46·94	·21
8	43 0 14·44	·14

Equations to be satisfied

					Factor
x_1	$+x_2$	$+x_3$	$+x_4$	$= e_1 = -0·224,$	λ_1
x_3	$+x_4$	$+x_5$	$+x_6$	$= e_2 = -0·332,$	λ_2
x_5	$+x_6$	$+x_7$	$+x_8$	$= e_3 = -1·201,$	λ_3

$$\left.\begin{array}{ccc} -33x_1 & -9x_2 & -21x_3 \\ +23x_6 & +5x_7 & +22x_8 \end{array}\right\} = e_4 = -2·8, \quad \lambda_4$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 0·224	+0·51	+0·26	...	− 7·83
2	− 0·332		+0·76	+0·50	+ 4·12
3	− 1·201		*	+0·85	+ 12·87
4	− 2·8				+431·62

Values of the Factors

$\lambda_1 = +0·3733$

$\lambda_2 = +1·3093$

$\lambda_3 = -3·6428$

$\lambda_4 = +0·0964$

Angular errors in seconds

$x_1 = -·112$	$x_5 = -·280$
$x_2 = -·104$	$x_6 = -·044$
$x_3 = -·075$	$x_7 = -·664$
$x_4 = +·067$	$x_8 = -·213$

$[wx^2] = 3·58$

Figure No. 51.

Observed Angles

No.	Value	Reciprocal Weight
	° ′ ″	
1	60 10 28·42	·16
2	64 19 51·69	·28
3	55 29 41·02	·15
4	68 21 17·50	·13
5	51 53 24·99	·12
6	59 45 18·75	·13
7	82 40 54·78	·23
8	33 47 47·05	·14
9	63 31 18·99	·17
10	84 13 25·55	·21
11	48 25 6·16	·20
12	47 21 29·24	·10
13	64 33 53·43	·29
14	77 30 43·90	·14
15	37 55 22·81	·17

Equations to be satisfied

Equations to be satisfied	Factor
$x_1 + x_2 + x_3 \ \ldots \ \ldots = e_1 = -0{\cdot}459,$	λ_1
$x_4 + x_5 + x_6 \ \ldots \ \ldots = e_2 = -0{\cdot}456,$	λ_2
$x_7 + x_8 + x_9 \ \ldots \ \ldots = e_3 = -0{\cdot}204,$	λ_3
$x_{10} + x_{11} + x_{12} \ \ldots \ \ldots = e_4 = +0{\cdot}301,$	λ_4
$x_{13} + x_{14} + x_{15} \ \ldots \ \ldots = e_5 = -0{\cdot}812,$	λ_5
$x_1 + x_4 + x_7 + x_{10} + x_{13} = e_6 = -0{\cdot}32,$	λ_6
$\left.\begin{array}{l} 14x_3 - 10x_2 + 12x_6 - 17x_5 + 11x_9 \\ -31x_8 + 20x_{12} - 19x_{11} + 27x_{15} - 4x_{14} \end{array}\right\} = e_7 = +4{\cdot}0,$	λ_7

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7
1	− 0·459	+0·59	...	...	...	...	+0·16	− 0·70
2	− 0·456		+0·38	...	...	...	+0·13	− 0·48
3	− 0·204			+0·54	...	...	+0·23	− 2·47
4	+ 0·301				+0·51	...	+0·21	− 1·80
5	− 0·812			*		+0·60	+0·29	+ 4·03
6	− 0·32						+1·02	...
7	+ 4·0							+504·28

Values of the Factors

$\lambda_1 = -0{\cdot}8957$
$\lambda_2 = -1{\cdot}3528$
$\lambda_3 = -0{\cdot}5133$
$\lambda_4 = +0{\cdot}4429$
$\lambda_5 = -1{\cdot}7244$
$\lambda_6 = +0{\cdot}5141$
$\lambda_7 = +0{\cdot}0183$

Angular errors in seconds

$x_1 = -\,{\cdot}061$	$x_6 = -\,{\cdot}147$	$x_{11} = +\,{\cdot}019$
$x_2 = -\,{\cdot}302$	$x_7 = \ \ {\cdot}000$	$x_{12} = +\,{\cdot}081$
$x_3 = -\,{\cdot}096$	$x_8 = -\,{\cdot}151$	$x_{13} = -\,{\cdot}351$
$x_4 = -\,{\cdot}109$	$x_9 = -\,{\cdot}053$	$x_{14} = -\,{\cdot}251$
$x_5 = -\,{\cdot}200$	$x_{10} = +\,{\cdot}201$	$x_{15} = -\,{\cdot}210$

$[wx^2] = 2{\cdot}57$

Figure No 52.

Observed Angles

No.	Value	Reciprocal Weight	No.	Value	Reciprocal Weight	No.	Value	Reciprocal Weight
	° ′ ″			° ′ ″			° ′ ″	
1	85 36 40·75	·16	10	46 58 16·51	·08	19	64 59 10·80	·02
2	51 59 37·42	·13	11	69 0 19·20	·10	20	52 43 20·49	·08
3	42 23 43·24	·10	12	64 1 26·23	·06	21	62 17 30·14	·05
4	67 34 52·49	·05	13	34 36 10·06	·07	22	75 37 19·64	·05
5	72 22 23·96	·07	14	76 47 17·43	·13	23	59 26 6·99	·03
6	40 2 44·83	·08	15	68 36 33·84	·12	24	44 56 35·38	·14
7	51 0 17·51	·05	16	74 13 42·63	·09	25	78 34 45·72	·05
8	62 18 24·38	·07	17	31 59 36·36	·09	26	39 2 47·44	·17
9	66 41 19·98	·07	18	73 46 42·90	·13	27	62 22 29·07	·15

Equations to be satisfied — Factor

Equation	Factor
$x_1 + x_2 + x_3 \ldots = e_1 = +\ 0·323,$	λ_1
$x_4 + x_5 + x_6 \ldots = e_2 = -\ 0·465,$	λ_2
$x_7 + x_8 + x_9 \ldots = e_3 = -\ 0·225,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots = e_4 = -\ 0·034,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots = e_5 = -\ 0·335,$	λ_5
$x_{16} + x_{17} + x_{18} \ldots = e_6 = +\ 0·262,$	λ_6
$x_{19} + x_{20} + x_{21} \ldots = e_7 = +\ 0·030,$	λ_7
$x_{22} + x_{23} + x_{24} \ldots = e_8 = +\ 0·370,$	λ_8
$x_{25} + x_{26} + x_{27} \ldots = e_9 = +\ 0·792,$	λ_9
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} \ldots = e_{10} = -\ 0·05,$	λ_{10}
$x_{12} + x_{19} + x_{22} + x_{25} + x_{14} \ldots = e_{11} = -\ 0·18,$	λ_{11}
$\left.\begin{array}{l} 23x_3 - 16x_2 + 25x_6 - 7x_5 + 9x_9 - 11x_8 \\ +11x_{12} - 8x_{11} + 9x_{15} - 5x_{14} + 6x_{18} - 33x_{17} \end{array}\right\} \ldots = e_{12} = +\ 22·2,$	λ_{12}
$\left.\begin{array}{l} 8x_{11} - 20x_{10} + 11x_{21} - 16x_{20} + 21x_{24} \\ -12x_{23} + 11x_{27} - 26x_{26} + 31x_{13} - 9x_{15} \end{array}\right\} \ldots = e_{13} = -\ 31·9,$	λ_{13}

Figure No. 52.—(Continued).

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}	λ_{11}	λ_{12}	λ_{13}
1	+ 0·323	+0·39	...	...	...	...	...	...	...	...	+0·16	...	+ 0·22	...
2	− 0·465		+0·20	...	...	...	...	...	...	...	+0·05	...	+ 1·51	...
3	− 0·225			+0·19	...	...	...	...	...	...	+0·05	...	− 0·14	...
4	− 0·034				+0·24	...	...	...	...	...	+0·08	+0·06	− 0·14	− 0·80
5	− 0·335					+0·32	...	...	...	...	+0·07	+0·13	+ 0·43	+ 1·09
6	+ 0·262						+0·31	...	...	...	+0·09	...	− 2·19	...
7	+ 0·030							+0·15	...	...	...	+0·02	...	− 0·73
8	+ 0·370								+0·22	...	...	+0·05	...	+ 2·58
9	+ 0·792							*		+0·37	...	+0·05	...	− 2·77
10	− 0·05										+0·50	...	...	+ 0·57
11	− 0·18											+0·31	+ 0·01	...
12	+22·2												+283·07	− 16·12
13	−31·9													+341·05

Values of the Factors

$\lambda_1 = +\ 0·7844$

$\lambda_2 = -\ 3·0775$

$\lambda_3 = -\ 1·1016$

$\lambda_4 = -\ 0·1147$

$\lambda_5 = -\ 0·3713$

$\lambda_6 = +\ 1·5659$

$\lambda_7 = -\ 0·1281$

$\lambda_8 = +\ 3·1031$

$\lambda_9 = +\ 1·5553$

$\lambda_{10} = -\ 0·0317$

$\lambda_{11} = -\ 1·1496$

$\lambda_{12} = +\ 0·1007$

$\lambda_{13} = -\ 0·0989$

Angular errors in seconds

$x_1 = +\ ·121$	$x_{10} = +\ ·146$	$x_{19} = -\ ·026$
$x_2 = -\ ·108$	$x_{11} = -\ ·171$	$x_{20} = +\ ·116$
$x_3 = +\ ·310$	$x_{12} = -\ ·009$	$x_{21} = -\ ·060$
$x_4 = -\ ·155$	$x_{13} = -\ ·243$	$x_{22} = +\ ·098$
$x_5 = -\ ·265$	$x_{14} = -\ ·263$	$x_{23} = +\ ·129$
$x_6 = -\ ·045$	$x_{15} = +\ ·171$	$x_{24} = +\ ·143$
$x_7 = -\ ·057$	$x_{16} = +\ ·138$	$x_{25} = +\ ·020$
$x_8 = -\ ·155$	$x_{17} = -\ ·158$	$x_{26} = +\ ·702$
$x_9 = -\ ·013$	$x_{18} = +\ ·282$	$x_{27} = +\ ·070$

$[wx^2] = 10·45$

Figure No. 53.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	73	42	37·75	·09
2	66	50	33·58	·06
3	39	26	51·08	·05
4	69	48	17·15	·06
5	44	31	29·87	·06
6	65	40	13·98	·06
7	57	24	42·19	·11
8	61	56	41·54	·05
9	60	38	37·18	·12
10	66	13	55·25	·12
11	52	34	34·30	·05
12	61	11	31·76	·05
13	48	25	18·36	·08
14	75	55	48·24	·04
15	55	38	54·57	·08
16	44	25	9·06	·05
17	55	12	0·43	·16
18	80	22	51·22	·11

Equations to be satisfied — **Factor**

$x_1 + x_2 + x_3 \;\ldots\;\ldots\;\ldots = e_1 = +\,0{\cdot}821$, λ_1

$x_4 + x_5 + x_6 \;\ldots\;\ldots\;\ldots = e_2 = -\,0{\cdot}730$, λ_2

$x_7 + x_8 + x_9 \;\ldots\;\ldots\;\ldots = e_3 = -\,0{\cdot}300$, λ_3

$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots\;\ldots = e_4 = +\,0{\cdot}103$, λ_4

$x_{13} + x_{14} + x_{15} \;\ldots\;\ldots\;\ldots = e_5 = +\,0{\cdot}120$, λ_5

$x_{16} + x_{17} + x_{18} \;\ldots\;\ldots\;\ldots = e_6 = -\,0{\cdot}251$, λ_6

$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -\,0{\cdot}24$, λ_7

$$\left.\begin{array}{l} 25x_3 - 9x_2 + 9x_6 - 21x_5 + 12x_9 - 11x_8 \\ +12x_{12} - 16x_{11} + 15x_{15} - 5x_{14} + 4x_{18} - 14x_{17} \end{array}\right\} = e_8 = -\,6{\cdot}7, \quad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+ 0·821	+0·20	...	...	...	...	...	+0·09	+ 0·71
2	− 0·730		+0·18	...	...	...	...	+0·06	− 0·72
3	− 0·300			+0·28	...	...	...	+0·11	+ 0·89
4	+ 0·103				+0·22	...	...	+0·12	− 0·20
5	+ 0·120					+0·20	...	+0·08	+ 1·00
6	− 0·251			*			+0·32	+0·05	− 1·80
7	− 0·24							+0·51	...
8	− 6·7								+162·88

Values of the Factors

$\lambda_1 = +\,4{\cdot}9964$

$\lambda_2 = -\,4{\cdot}0623$

$\lambda_3 = -\,0{\cdot}2852$

$\lambda_4 = +\,1{\cdot}0243$

$\lambda_5 = +\,1{\cdot}5780$

$\lambda_6 = -\,1{\cdot}1648$

$\lambda_7 = -\,1{\cdot}1872$

$\lambda_8 = -\,0{\cdot}1006$

Angular errors in seconds

$x_1 = +\,{\cdot}343$	$x_7 = -\,{\cdot}162$	$x_{13} = +\,{\cdot}031$
$x_2 = +\,{\cdot}354$	$x_8 = +\,{\cdot}041$	$x_{14} = +\,{\cdot}083$
$x_3 = +\,{\cdot}124$	$x_9 = -\,{\cdot}179$	$x_{15} = +\,{\cdot}006$
$x_4 = -\,{\cdot}315$	$x_{10} = -\,{\cdot}020$	$x_{16} = -\,{\cdot}117$
$x_5 = -\,{\cdot}117$	$x_{11} = +\,{\cdot}132$	$x_{17} = +\,{\cdot}039$
$x_6 = -\,{\cdot}298$	$x_{12} = -\,{\cdot}009$	$x_{18} = -\,{\cdot}173$

$[wx^2] = 8{\cdot}70$

Figure No. 54.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	78	27	49·37	·03
2	49	56	19·27	·05
3	51	35	51·53	·13
4	59	3	51·94	·10
5	64	23	49·65	·08
6	56	32	19·95	·11
7	54	57	33·62	·12
8	50	58	25·44	·16
9	74	4	1·71	·08
10	80	12	16·86	·08
11	64	22	35·43	·09
12	35	25	8·76	·13
13	42	14	33·97	·13
14	70	0	3·26	·08
15	67	45	23·51	·12
16	45	3	53·69	·06
17	47	50	45·94	·03
18	87	5	20·83	·10

Equations to be satisfied — Factor

$$x_1 + x_2 + x_3 \ \ldots \ \ldots \ \ldots = e_1 = -0{\cdot}801, \qquad \lambda_1$$
$$x_4 + x_5 + x_6 \ \ldots \ \ldots \ \ldots = e_2 = +0{\cdot}642, \qquad \lambda_2$$
$$x_7 + x_8 + x_9 \ \ldots \ \ldots \ \ldots = e_3 = +0{\cdot}022, \qquad \lambda_3$$
$$x_{10} + x_{11} + x_{12} \ \ldots \ \ldots \ \ldots = e_4 = -0{\cdot}082, \qquad \lambda_4$$
$$x_{13} + x_{14} + x_{15} \ \ldots \ \ldots \ \ldots = e_5 = -0{\cdot}480, \qquad \lambda_5$$
$$x_{16} + x_{17} + x_{18} \ \ldots \ \ldots \ \ldots = e_6 = -0{\cdot}508, \qquad \lambda_6$$
$$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -0{\cdot}55, \qquad \lambda_7$$
$$\left.\begin{array}{l} 17x_3 - 18x_2 + 14x_6 - 10x_5 + 6x_9 - 17x_8 \\ +30x_{12} - 10x_{11} + 9x_{15} - 8x_{14} + x_{18} - 19x_{17} \end{array}\right\} = e_8 = -4{\cdot}4, \qquad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·801	+0·21	...	...	...	...	...	+0·03	+ 1·31
2	+ 0·642		+0·29	...	...	...	...	+0·10	+ 0·74
3	+ 0·022			+0·36	...	...	...	+0·12	− 2·24
4	− 0·082				+0·30	...	...	+0·08	+ 3·00
5	− 0·480					+0·33	...	+0·13	+ 0·44
6	− 0·508			*			+0·19	+0·06	− 0·47
7	− 0·55							+0·52	...
8	− 4·4								+284·22

Values of the Factors

$\lambda_1 = -3{\cdot}6629$
$\lambda_2 = +2{\cdot}5179$
$\lambda_3 = +0{\cdot}3117$
$\lambda_4 = +0{\cdot}0020$
$\lambda_5 = -1{\cdot}1152$
$\lambda_6 = -2{\cdot}4189$
$\lambda_7 = -0{\cdot}8448$
$\lambda_8 = -0{\cdot}0050$

Angular errors in seconds

$x_1 = -{\cdot}135$	$x_7 = -{\cdot}064$	$x_{13} = -{\cdot}255$
$x_2 = -{\cdot}179$	$x_8 = +{\cdot}063$	$x_{14} = -{\cdot}086$
$x_3 = -{\cdot}487$	$x_9 = +{\cdot}023$	$x_{15} = -{\cdot}139$
$x_4 = +{\cdot}167$	$x_{10} = -{\cdot}067$	$x_{16} = -{\cdot}196$
$x_5 = +{\cdot}206$	$x_{11} = +{\cdot}005$	$x_{17} = -{\cdot}070$
$x_6 = +{\cdot}269$	$x_{12} = -{\cdot}020$	$x_{18} = -{\cdot}242$

$[wx^2] = 6{\cdot}81$

December, 1883.

W. H. COLE,
In charge of Computing Office.

MADRAS MERIDIONAL AND COAST SERIES.

PRINCIPAL TRIANGULATION. TRIANGLES.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ′ "			
147		XII (Kándágatla)	·895	+ ·234	− ·025		+ ·209	84 39 13·134	5·1579209,1	143853·65	27·245
		XV (Adáligat)	·894	+ ·206	− ·013		+ ·193	45 32 42·629	5·0133926,4	103131·81	19·533
		II (Niálamari)	·895	+ ·054	+ ·038		+ ·092	49 48 4·237	5·0427993,1	110356·86	20·901
			2·684				+ ·494	180 0 0·000			
148		XV (Adáligat)	·862	− ·088	− ·040		− ·128	40 12 45·590	4·9693784,4	93191·97	17·650
		II (Niálamari)	·862	− ·220	+ ·010		− ·210	54 30 31·148	5·0701298,8	117524·90	22·259
		I (Anantagiri)	·862	− ·116	+ ·030		− ·086	85 16 43·262	5·1579209,1	143853·65	27·245
			2·586				− ·424	180 0 0·000			
	419	XII (Kándágatla)	1·021	+ ·122		+ ·011	+ ·133	49 3 39·992	5·0701298,8	117524·90	22·259
		XV (Adáligat)	1·022	+ ·118		− ·053	+ ·065	85 45 28·953	5·1907564,8	155151·67	29·385
		I (Anantagiri)	1·021	− ·006		+ ·042	+ ·036	45 10 51·055	5·0427993,1	110356·86	20·901
			3·064				+ ·234	180 0 0·000			
149		II (Niálamari)	·906	+ ·006	− ·021		− ·015	90 30 37·089	5·1905323,8	155071·64	29·370
		I (Anantagiri)	·906	+ ·078	− ·017		+ ·061	52 33 9·605	5·0903222,5	123118·20	23·318
		IV (Sárangapalle)	·906	− ·086	+ ·038		− ·048	36 56 13·306	4·9693784,4	93191·97	17·650
			2·718				− ·002	180 0 0·000			
150		I (Anantagiri)	1·067	+ ·217	− ·017		+ ·200	41 58 15·743	5·0203045,3	104786·31	19·846
		IV (Sárangapalle)	1·067	− ·042	− ·008		− ·050	56 16 2·933	5·1149724,6	130308·43	24·680
		III (Miádarsál)	1·067	+ ·086	+ ·025		+ ·111	81 45 41·324	5·1905323,8	155071·64	29·370
			3·201				+ ·261	180 0 0·000			

Note.—1. The values of the sides are given in the same lines with the opposite angles.
2. Stations XII (Kándágatla) and XV (Adáligat) appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections: Circuit	Corrections: Non-circuit	Corrections: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			"	"	"	"	"	° ′ "			
		II (Niálamari)	.956	+ .060		− .006	+ .054	51 27 42.768	5.1149724,6	130308.43	24.680
	420	I (Anantagiri)	.956	+ .295		− .034	+ .261	94 31 26.365	5.2203028,8	166074.48	31.453
		III (Miádarsál)	.956	+ .153		+ .040	+ .193	34 0 50.867	4.9693784,4	93191.97	17.650
			2.868				+ .508	180 0 0.000			
		III (Miádarsál)	.557	+ .223	− .002		+ .221	65 3 37.464	4.9985399,2	99664.37	18.876
151		IV (Sárangapalle)	.557	+ .347	− .024		+ .323	42 30 32.006	4.8708078,7	74269.05	14.066
		V (Kachalboru)	.558	+ .272	+ .026		+ .298	72 25 50.530	5.0203045,3	104786.31	19.846
			1.672				+ .842	180 0 0.000			
		IV (Sárangapalle)	.473	− .166	− .034		− .200	29 23 53.797	4.7823253,1	60579.45	11.473
152		V (Kachalboru)	.474	− .060	+ .020		− .040	96 44 28.166	5.0883393,1	122557.33	23.212
		VIII (Mániam)	.473	+ .046	+ .014		+ .060	53 51 38.037	4.9985399,2	99664.37	18.876
			1.420				− .180	180 0 0.000			
		V (Kachalboru)	.235	− .104	+ .005		− .099	87 29 27.936	4.8828335,6	76354.31	14.461
153		VIII (Mániam)	.235	− .061	− .022		− .083	40 4 34.042	4.6920042,8	49204.44	9.319
		VII (Dhúlipalla)	.235	+ .130	+ .017		+ .147	52 25 58.022	4.7823253,1	60579.45	11.473
			.705				− .035	180 0 0.000			
		III (Miádarsál)	.291	+ .005		− .012	− .007	66 8 23.102	4.8579498,5	72102.43	13.656
	421	V (Kachalboru)	.291	− .127		− .036	− .163	43 28 2.446	4.7343008,8	54237.65	10.272
		VI (Voruvakallu)	.291	− .025		+ .048	+ .023	70 23 34.452	4.8708078,7	74269.05	14.066
			.873				− .147	180 0 0.000			
		V (Kachalboru)	.242	− .011		− .015	− .026	59 52 9.122	4.8041591,5	63702.89	12.065
	422	VI (Voruvakallu)	.242	+ .076		− .042	+ .034	41 54 57.242	4.6920042,8	49204.44	9.319
		VII (Dhúlipalla)	.243	+ .132		+ .057	+ .189	78 12 53.636	4.8579498,5	72102.43	13.656
			.727				+ .197	180 0 0.000			
		VII (Dhúlipalla)	.557	+ .003	+ .075		+ .078	63 9 54.981	4.9867202,0	96988.49	18.369
154		VIII (Mániam)	.557	− .379	+ .030		− .349	72 12 32.044	5.0149209,5	103495.38	19.601
		IX (Kotapa)	.557	− .103	− .105		− .208	44 37 32.975	4.8828335,6	76354.31	14.461
			1.671				− .479	180 0 0.000			
		VIII (Mániam)	.826	+ .624	+ .012		+ .636	66 14 26.510	5.0741933,7	118629.69	22.468
155		IX (Kotapa)	.826	+ .439	− .144		+ .295	65 19 3.439	5.0710457,5	117773.00	22.305
		XI (Yĕrrakŏnda)	.825	− .006	+ .132		+ .126	48 26 30.051	4.9867202,0	96988.49	18.369
			2.477				+ 1.057	180 0 0.000			
		XI (Yĕrrakŏnda)	.675	− .205	− .003		− .208	46 3 23.917	4.9408003,3	87257.01	16.526
156		IX (Kotapa)	.676	− .347	− .104		− .451	55 43 56.153	5.0006504,3	100149.87	18.968
		XIV (Dánapa)	.676	− .981	+ .107		− .874	78 12 39.930	5.0741933,7	118629.69	22.468
			2.027				− 1.533	180 0 0.000			
		IX (Kotapa)	.417	+ .078	− .120		− .042	48 14 1.241	4.8389852,2	69021.64	13.072
157		XIV (Dánapa)	.417	+ .258	+ .133		+ .391	61 13 3.794	4.9090534,1	81106.08	15.361
		XIII (Babbĕpalle)	.417	− .115	− .013		− .128	70 32 54.965	4.9408003,3	87257.01	16.526
			1.251				+ .221	180 0 0.000			
		X (Ádamsáb)	.652	+ .787	− .119		+ .668	65 57 0.616	5.0149209,5	103495.38	19.601
210		VII (Dhúlipalla)	.652	− .406	+ .193		− .213	57 9 44.885	4.9787477,8	95224.30	18.035
		IX (Kotapa)	.652	+ .195	− .074		+ .121	56 53 14.499	4.9773948,8	94928.13	17.979
			1.956				+ .576	180 0 0.000			
		X (Ádamsáb)	.490	− .453		− .208	− .661	63 46 32.119	4.9576041,8	90699.35	17.178
	423	IX (Kotapa)	.489	+ .100		+ .267	+ .367	45 51 50.978	4.8607152,1	72563.00	13.743
		XII (Pálapáru)	.490	+ .122		− .059	+ .063	70 21 36.903	4.9787477,8	95224.30	18.035
			1.469				− .231	180 0 0.000			

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ′ "			
		IX (Kotapa)	·398	− ·112		+ ·280	+ ·168	43 20 16·700	4·8065969,9	64061·48	12·133
	424	XII (Pálapáru)	·399	− ·625		− ·211	− ·836	60 19 52·635	4·9090534,1	81106·08	15·361
		XIII (Babbĕpalle)	·399	− ·097		− ·069	− ·166	76 19 50·665	4·9576041,8	90699·35	17·178
			1·196				− ·834	180 0 0·000			
		XIV (Dánapa)	·408	− ·045	+ ·023		− ·022	75 8 39·570	4·9521601,5	89569·50	16·964
158		XIII (Babbĕpalle)	·408	− ·268	− ·118		− ·386	56 42 38·476	4·8890840,8	77461·18	14·671
		XV (Medaramĕtla)	·408	+ ·037	+ ·095		+ ·132	48 8 41·954	4·8389852,2	69021·64	13·072
			1·224				− ·276	180 0 0·000			
		XIII (Babbĕpalle)	·506	+ ·197	− ·099		+ ·098	45 33 1·192	4·8701151,3	74150·68	14·044
159		XV (Medaramĕtla)	·507	+ ·167	+ ·104		+ ·271	74 52 23·254	5·0011834,8	100272·88	18·991
		XVI (Faranguldinne)	·506	+ ·065	− ·005		+ ·060	59 34 35·554	4·9521601,5	89569·50	16·964
			1·519				+ ·429	180 0 0·000			
		XVI (Faranguldinne)	·463	+ ·076	− ·083		− ·007	61 49 51·770	4·9306122,3	85233·87	16·143
160		XV (Medaramĕtla)	·463	+ ·106	+ ·089		+ ·195	68 5 24·552	4·9528020,2	89701·98	16·989
		XVIII (Ongole)	·463	− ·133	− ·006		− ·139	50 4 43·678	4·8701151,3	74150·68	14·044
			1·389				+ ·049	180 0 0·000			
		XV (Medaramĕtla)	·461	− ·329	+ ·021		− ·308	65 22 45·281	4·9398721,5	87070·73	16·491
161		XVIII (Ongole)	·460	− ·526	− ·092		− ·618	51 45 33·032	4·8763673,2	75225·88	14·247
		XIX (Chemakurti)	·460	− ·914	+ ·071		− ·843	62 51 41·687	4·9306122,3	85233·87	16·143
			1·381				−1·769	180 0 0·000			
		XIV (Dánapa)	·507	− ·560		+ ·034	− ·526	82 0 55·737	5·0246808,4	105847·55	20·047
	425	XV (Medaramĕtla)	·507	− ·478		− ·184	− ·662	51 32 19·131	4·9226888,4	83692·95	15·851
		XVII (Pĕddakaltippa)	·507	− ·171		+ ·150	− ·021	46 26 45·132	4·8890840,8	77461·18	14·671
			1·521				−1·209	180 0 0·000			
		XV (Medaramĕtla)	·495	+ ·907		− ·125	+ ·782	51 58 22·987	4·9241671,9	83978·33	15·905
	426	XVII (Pĕddakaltippa)	·495	+ ·111		+ ·001	+ ·112	44 52 47·577	4·8763673,2	75225·88	14·247
		XIX (Chemakurti)	·496	+ ·598		+ ·124	+ ·722	83 8 49·436	5·0246808,4	105847·55	20·047
			1·486				+1·616	180 0 0·006			
		XIX (Chemakurti)	·542	+ ·181	+ ·016		+ ·197	63 30 3·585	4·9644198,2	92133·98	17·450
162		XVIII (Ongole)	·542	− ·466	+ ·073		− ·539	58 44 43·899	4·9445256,5	88008·70	16·668
		XX (Netivaripálĕm)	·541	·000	+ ·057		+ ·057	57 45 12·516	4·9398721,5	87070·73	16·491
			1·625				− ·285	180 0 0·000			
		XVIII (Ongole)	·526	+ ·408	− ·065		+ ·343	48 8 37·147	4·8883723,9	77334·34	14·647
163		XX (Netivaripálĕm)	·527	+ ·038	+ ·071		+ ·109	69 18 47·752	4·9873768,1	97135·25	18·397
		XXI (Puripád)	·526	− ·207	− ·006		− ·213	62 32 35·101	4·9644198,2	92133·98	17·450
			1·579				+ ·239	180 0 0·000			
		XX (Netivaripálĕm)	·651	+ ·378	+ ·013		+ ·391	71 33 34·360	5·0587648,0	114489·26	21·684
164		XXI (Puripád)	·651	+ ·237	− ·075		+ ·162	68 35 23·241	5·0506028,4	112357·70	21·280
		XXIV (Kuchĕrla)	·651	− ·482	+ ·062		− ·420	39 51 2·399	4·8883723,9	77334·34	14·647
			1·953				+ ·133	180 0 0·000			
		XXI (Puripád)	·581	− ·070	− ·050		− ·120	48 46 40·209	4·9379449,6	86685·19	16·418
165		XXIV (Kuchĕrla)	·580	− ·024	+ ·064		+ ·040	47 48 6·170	4·9313501,0	85378·80	16·170
		XXV (Darutippa)	·581	− ·144	− ·014		− ·158	83 25 13·621	5·0587648,0	114489·26	21·684
			1·742				− ·238	180 0 0·000			
		XXV (Darutippa)	·313	+ ·024	− ·043		− ·019	65 27 53·968	4·9038126,4	80133·23	15·177
166		XXIV (Kuchĕrla)	·313	+ ·137	+ ·061		+ ·198	34 46 10·555	4·7009972,4	50233·94	9·514
		XXVI (Kesavaram)	·313	+ ·018	− ·018		·000	79 45 55·477	4·9379449,6	86685·19	16·418
			·939				+ ·179	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			"	"	"	"	"	° ′ ″			
167		XXIV (Kuchĕrla)	·510	+ ·121	+ ·019		+ ·140	84 18 20·080	5·0337848,9	108089·85	20·472
		XXVI (Kesavaram)	·510	+ ·018	− ·065		− ·047	48 9 31·093	4·9080865,4	80925·71	15·327
		XXVII (Chákalakŏnda)	·509	+ ·140	+ ·046		+ ·186	47 32 8·827	4·9038126,4	80133·23	15·177
			1·529				+ ·279	180 0 0·000			
	427	XIX (Chemakurti)	·588	− ·174		− ·015	− ·189	62 56 27·813	4·9810701,9	95734·89	18·132
		XX (Netivaripálĕm)	·588	+ ·058		− ·059	− ·001	62 6 25·721	4·9777829,9	95013·00	17·995
		XXII (Nishánkŏnda)	·588	+ ·720		+ ·074	+ ·794	54 57 6·466	4·9445256,5	88008·70	16·668
			1·764				+ ·604	180 0 0·000			
	428	XXII (Nishánkŏnda)	·826	−1·647		− ·018	−1·665	68 56 48·159	5·0851272,2	121654·24	23·041
		XX (Netivaripálĕm)	·825	− ·423		− ·068	− ·491	63 47 44·834	5·0680326,0	116958·71	22·151
		XXIII (Pichĕrla)	·825	− ·174		+ ·086	− ·088	47 15 27·007	4·9810701,9	95734·89	18·132
			2·476				−2·244	180 0 0·000			
	429	XX (Netivaripálĕm)	·626	− ·021		− ·014	− ·035	35 28 11·059	4·[illegible]563112,2	71830·89	13·604
		XXIII (Pichĕrla)	·626	− ·366		+ ·087	− ·279	65 11 2·995	5·0[illegible]06028,4	112357·70	21·280
		XXIV (Kuchĕrla)	·627	+ ·156		− ·073	+ ·083	79 20 45·946	5·08[illegible]1272,2	121654·24	23·041
			1·879				− ·231	180 0 0·000			
	430	XXIII (Pichĕrla)	·441	− ·145		+ ·045	− ·100	57 33 39·199	4·90808[illegible]65,4	80925·71	15·327
		XXIV (Kuchĕrla)	·442	− ·088		− ·133	− ·221	73 55 31·727	4·96444[illegible]9,2	92138·88	17·450
		XXVII (Chákalakŏnda)	·441	− ·803		+ ·088	− ·715	48 30 49·074	4·85631[illegible]2,2	71830·89	13·604
			1·324				−1·036	180 0 0·000			
168		XXVII (Chákalakŏnda)	·696	− ·021	+ ·017		− ·004	61 37 20·050	5·0156756[illegible]0	103675·37	19·635
		XXVI (Kesavaram)	·696	+ ·137	− ·066		+ ·071	51 50 37·785	4·9668800,[illegible]0	92657·38	17·549
		XXVIII (Rájalli)	·696	+ ·082	+ ·049		+ ·131	66 32 2·165	5·0337848,[illegible]9	108089·85	20·472
			2·088				+ ·198	180 0 0·000			
169		XXVI (Kesavaram)	·681	+ ·077	− ·041		+ ·036	71 43 43·965	5·0521689,4	112763·59	21·357
		XXVIII (Rájalli)	·680	+ ·309	+ ·053		+ ·362	47 27 21·332	4·9419602,9	87490·38	16·570
		XXIX (Nishánbodu)	·680	+ ·335	− ·012		+ ·323	60 48 54·703	5·0156756,0	103675·37	19·635
			2·041				+ ·721	180 0 0·000			
170		XXIX (Nishánbodu)	·805	− ·158	− ·049		− ·207	56 49 24·548	5·0218579,3	105161·77	19·917
		XXVIII (Rájalli)	·806	− ·049	+ ·060		+ ·011	59 20 46·275	5·0337698,9	108086·12	20·471
		XXXI (Kistama)	·806	+ ·004	− ·011		− ·007	63 49 49·177	5·0521689,4	112763·59	21·35[illegible]
			2·417				− ·203	180 0 0·000			
171		XXVIII (Rájalli)	·815	+ ·264	+ ·016		+ ·280	53 35 16·685	5·0149384,6	1[illegible]3499·56	19·602
		XXXI (Kistama)	·816	+ ·131	− ·058		+ ·073	71 33 26·717	5·0863691,3	12[illegible]2002·62	23·107
		XXXII (Pallakŏnda)	·816	+ ·502	+ ·042		+ ·544	54 51 16·598	5·0218579,3	105[illegible]161·77	19·917
			2·447				+ ·897	180 0 0·000			
	431	XXVII (Chákalakŏnda)	·853	− ·164		+ ·044	− ·120	68 49 11·507	5·0997771,6	12582[illegible]·96	23·831
		XXVIII (Rájalli)	·853	− ·072		− ·089	− ·161	67 48 56·016	5·0967504,6	124954[illegible]·08	23·666
		XXX (Yĕrrakŏnda)	·852	− ·226		+ ·045	− ·181	43 21 52·477	4·9668800,0	92657[illegible]38	17·549
			2·558				− ·462	180 0 0·000			
	432	XXVIII (Rájalli)	1·102	− ·454		− ·089	− ·543	65 15 32·575	5·1260348,4	133670·29	25·316
		XXX (Yĕrrakŏnda)	1·101	− ·523		+ ·043	− ·480	55 59 22·009	5·0863691,3	122002·62	23·10[illegible]
		XXXII (Pallakŏnda)	1·101	− ·839		+ ·046	− ·793	58 45 5·416	5·0997771,6	125827·96	2[illegible]3·8[illegible]1
			3·304				−1·816	180 0 0·000			
172		XXXI (Kistama)	·603	+ ·329	− ·025		+ ·304	67 54 55·641	5·0176238,0	104141·49	19[illegible]·724
		XXXII (Pallakŏnda)	·602	+ ·032	+ ·034		+ ·066	45 1 25·874	4·9003831,6	79502·94	15[illegible]057
		XXXIII (Vutukúr)	·602	+ ·136	− ·009		+ ·127	67 3 38·485	5·0149384,6	103499·56	19·[illegible]02
			1·807				+ ·497	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			"	"	"	"	"	° ′ "			
173		XXXII (Pallakŏnda)	·565	− ·115	+ ·013		− ·102	54 11 39·133	4·9431966,1	87739·80	16·617
		XXXIII (Vutukúr)	·565	− ·280	− ·034		− ·314	51 31 22·861	4·9278563,6	84694·72	16·041
		XXXV (Pálchĕrla)	·565	− ·290	+ ·021		− ·269	74 16 58·006	5·0176238,0	104141·49	19·724
			1·695				− ·685	180 0 0·000			
174		XXXV (Pálchĕrla)	·518	− ·004	+ ·013		+ ·009	57 32 46·381	4·9289466,5	84907·62	16·081
		XXXIII (Vutukúr)	·519	− ·117	− ·038		− ·155	61 45 54·906	4·9476785,5	88649·97	16·790
		XXXVI (Kayyúr)	·518	− ·124	+ ·025		− ·099	60 41 18·713	4·9431966,1	87739·80	16·617
			1·555				− ·245	180 0 0·000			
175		XXXIII (Vutukúr)	·410	+ ·220	− ·019		+ ·201	40 27 26·971	4·7967484,6	62625·11	11·861
		XXXVI (Kayyúr)	·411	+ ·166	+ ·033		+ ·199	77 55 44·008	4·9748711,3	94378·07	17·875
		XXXVII (Gurramkŏnda)	·411	− ·264	− ·014		− ·278	61 36 49·021	4·9289466,5	84907·62	16·081
			1·232				+ ·122	180 0 0·000			
176		XXXVI (Kayyúr)	·280	+ ·154	+ ·021		+ ·175	70 50 48·305	4·8511842,3	70987·89	13·445
		XXXVII (Gurramkŏnda)	·279	− ·028	− ·038		− ·066	52 42 28·145	4·7765867,2	59784·24	11·323
		XL (Pillimedu)	·279	+ ·042	+ ·017		+ ·059	56 26 43·550	4·7967484,6	62625·11	11·861
			·838				+ ·168	180 0 0·000			
177		XXXVII (Gurramkŏnda)	·502	+ ·125	− ·013		+ ·112	73 58 6·270	5·0012144,8	100280·04	18·992
		XL (Pillimedu)	·502	+ ·247	+ ·030		+ ·277	63 9 33·635	4·9689358,2	93097·03	17·632
		XXXIX (Ánĕpúdi)	·501	+ ·223	− ·017		+ ·206	42 52 20·095	4·8511842,3	70987·89	13·445
			1·505				+ ·595	180 0 0·000			
	433	XXXI (Kistama)	·468	− ·192		− ·029	− ·221	61 44 37·671	4·9256896,2	84273·22	15·961
		XXXIII (Vutukúr)	·468	− ·008		+ ·060	+ ·052	62 3 24·154	4·9269559,9	84519·33	16·007
		XXXIV (Bandalduru)	·467	+ ·113		− ·031	+ ·082	56 11 58·175	4·9003831,6	79502·94	15·057
			1·403				− ·087	180 0 0·000			
	434	XXXIII (Vutukúr)	·613	+ ·109		+ ·040	+ ·149	77 8 9·446	5·0478926,1	111658·72	21·147
		XXXIV (Bandalduru)	·612	+ ·126		− ·040	+ ·086	55 29 22·224	4·9748711,3	94378·07	17·875
		XXXVII (Gurramkŏnda)	·612	+ ·482		·000	+ ·482	47 22 28·330	4·9256896,2	84273·22	15·961
			1·837				+ ·717	180 0 0·000			
	435	XXXIV (Bandalduru)	·538	+ ·099		− ·027	+ ·072	34 43 7·654	4·8157814,0	65430·67	12·392
		XXXVII (Gurramkŏnda)	·538	+ ·067		+ ·036	+ ·103	68 53 4·875	5·0300653,7	107168·07	20·297
		XXXVIII (Gudali)	·539	+ ·199		− ·009	+ ·190	76 23 47·471	5·0478926,1	111658·72	21·147
			1·615				+ ·365	180 0 0·000			
	436	XXXVII (Gurramkŏnda)	·396	− ·362		+ ·029	− ·333	55 27 0·621	4·8904856,1	77711·56	14·718
		XXXVIII (Gudali)	·397	− ·232		− ·020	− ·252	80 38 38·941	4·9689358,2	93097·03	17·632
		XXXIX (Ánĕpúdi)	·396	+ ·033		− ·009	+ ·024	43 54 20·438	4·8157814,0	65430·67	12·392
			1·189				− ·561	180 0 0·000			
178		XXXIX (Ánĕpúdi)	·724	− ·698	− ·011		− ·709	71 21 18·257	5·0596823,0	114731·40	21·729
		XL (Pillimedu)	·723	− ·195	+ ·029		− ·166	52 44 1·271	4·9839149,5	96364·03	18·251
		XLI (Kambákamdurgam)	·723	− ·517	− ·018		− ·535	55 54 40·472	5·0012144,8	100280·04	18·992
			2·170				−1·410	180 0 0·000			
179		XL (Pillimedu)	·635	+ ·237	+ ·020		+ ·257	73 15 45·992	5·0680779,4	116970·93	22·154
		XLI (Kambákamdurgam)	·635	+ ·461	− ·027		+ ·434	36 48 9·939	4·8643495,7	73172·78	13·858
		XLIII (Yerpet)	·635	+ ·267	+ ·007		+ ·274	69 56 4·069	5·0596823,0	114731·40	21·729
			1·905				+ ·965	180 0 0·000			
180		XLIII (Yerpet)	·972	+ ·360	+ ·024		+ ·384	59 3 35·472	5·0726030,2	118196·07	22·386
		XLI (Kambákamdurgam)	·972	+1·071	− ·029		+1·042	62 51 25·840	5·0885927,7	122628·89	23·225
		XXXIII (Nagari)	·972	+ ·675	+ ·005		+ ·680	58 4 58·688	5·0680779,4	116970·93	22·154
			2·916				+2·106	180 0 0·000			

Note.—Station XXXIII (Nagari) appertains to the Madras Longitudinal Series.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
181		XLI (Kambákamdurgam)	1·094	− ·683	·000		− ·683	72 56 17·603	5·1557144,3	143124·65	27·107
		XXXIII (Nagari)	1·094	−1·391	+ ·019		−1·372	54 55 29·194	5·0882262,6	122525·44	23·206
		XXXV (Chĕmbedu)	1·093	+ ·055	− ·019		+ ·036	52 8 13·203	5·0726030,2	118196·07	22·386
			3·281				−2·019	180 0 0·000			
	437	XXXIX (Ánĕpúdi)	·686	+ ·007		− ·011	− ·004	78 40 1·650	5·0767564,4	119331·88	22·601
		XLI (Kambákamdurgam)	·685	− ·069		+ ·024	− ·045	48 58 49·010	4·9629578,3	91824·35	17·391
		XLII (Jonangipálĕm)	·685	− ·172		− ·013	− ·185	52 21 9·340	4·9839149,5	96364·03	18·251
			2·056				− ·234	180 0 0·000			
	438	XLII (Jonangipálĕm)	·684	+ ·023		− ·012	+ ·011	72 9 49·567	5·0802490,7	120295·42	22·783
		XLI (Kambákamdurgam)	·683	− ·208		+ ·025	− ·183	37 2 51·344	4·8815827,3	76134·71	14·419
		XLIV (Rĕttambedu)	·683	− ·145		− ·013	− ·158	70 47 19·089	5·0767564,4	119331·88	22·601
			2·050				− ·330	180 0 0·000			
	439	XLI (Kambákamdurgam)	·830	− ·045		+ ·025	− ·020	45 27 40·170	4·9724256,0	93848·13	17·774
		XLIV (Rĕttambedu)	·830	+ ·154		− ·012	+ ·142	68 31 30·902	5·0882262,6	122525·44	23·206
		XXXV (Chĕmbedu)	·830	− ·049		− ·013	− ·062	66 0 48·928	5·0802490,7	120295·42	22·783
			2·490				+ ·060	180 0 0·000			
184		XXXIX (Dhár)	·768	+ ·403	− ·066		+ ·337	79 11 27·219	5·1063620,1	127750·33	24·195
		XLI (Sánjib)	·768	+ ·162	+ ·152		+ ·314	45 11 35·776	4·9650817,5	92274·51	17·476
		XLV (Gundálamma)	·768	+ ·349	− ·086		+ ·263	55 36 57·005	5·0307325,3	107332·82	20·328
			2·304				+ ·914	180 0 0·000			
185		XLI (Sánjib)	·689	+ ·344	+ ·093		+ ·437	42 45 15·348	4·9394926,4	86994·67	16·476
		XLV (Gundálamma)	·689	+ ·178	− ·136		+ ·042	51 45 59·823	5·0028595,6	100660·62	19·065
		XLVI (Kappakŏnda)	·690	+ ·306	+ ·043		+ ·349	85 28 44·829	5·1063620,1	127750·33	24·195
			2·068				+ ·828	180 0 0·000			
186		XLVI (Kappakŏnda)	·526	− ·161	+ ·086		− ·075	47 32 46·809	4·8948934,4	78504·30	14·868
		XLV (Gundálamma)	·527	− ·045	− ·115		− ·160	77 36 23·023	5·0167005,1	103920·34	19·682
		XLVIII (Nágal)	·527	− ·394	+ ·029		− ·365	54 50 50·168	4·9394926,4	86994·67	16·476
			1·580				− ·600	180 0 0·000			
187		XLV (Gundálamma)	·423	− ·343	− ·039		− ·382	65 24 37·655	4·9190357,2	82991·91	15·718
		XLVIII (Nágal)	·422	− ·308	+ ·112		− ·196	55 15 24·822	4·8750442,9	74997·07	14·204
		XLIX (Kalimámidi)	·423	− ·601	− ·073		− ·674	59 19 57·523	4·8948934,4	78504·30	14·868
			1·268				−1·252	180 0 0·000			
	440	XXXIX (Dhár)	·530	− ·265		− ·039	− ·304	67 11 8·646	4·9791881,6	95320·90	18·053
		XLV (Gundálamma)	·529	− ·066		+ ·202	+ ·136	49 38 58·567	4·8965786,0	78809·51	14·926
		XLVII (Pagulráyi)	·529	− ·211		− ·163	− ·374	63 9 52·787	4·9650817,5	92274·51	17·476
			1·588				− ·542	180 0 0·000			
	441	XLV (Gundálamma)	·489	+ ·407		+ ·174	+ ·581	59 57 0·502	4·9390043,6	86896·91	16·458
		XLVII (Pagulráyi)	·488	+ ·323		− ·006	+ ·317	48 20 9·069	4·8750442,9	74997·07	14·204
		XLIX (Kalimámidi)	·489	+ ·326		− ·168	+ ·158	71 42 50·429	4·9791881,6	95320·90	18·053
			1·466				+1·056	180 0 0·000			
188		XLVIII (Nágal)	·535	+ ·337	+ ·074		+ ·411	88 19 5·246	5·0596540,8	114723·95	21·728
		XLIX (Kalimámidi)	·535	− ·074	− ·086		− ·160	45 22 17·025	4·9121232,1	81681·41	15·470
		L (Nallakŏnda)	·535	+ ·292	+ ·012		+ ·304	46 18 37·729	4·9190357,2	82991·91	15·718
			1·605				+ ·555	180 0 0·000			
189		XLIX (Kalimámidi)	·591	+ ·015	− ·023		− ·008	43 45 23·361	4·9039927,2	80166·47	15·183
		L (Nallakŏnda)	·591	− ·310	+ ·072		− ·238	54 27 55·151	4·9746393,6	94327·73	17·865
		LII (Kappa)	·591	− ·532	− ·049		− ·581	81 46 41·488	5·0596540,8	114723·95	21·728
			1·773				− ·827	180 0 0·000			

NOTE.—1. Stations XXXIII (Nagari) and XXXV (Chĕmbedu) appertain to the Madras Longitudinal Series.
2. Stations XXXIX (Dhár) and XLI (Sánjib) appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ′ ″			
		LII (Kappa)	·461	+ ·373	− ·015		+ ·358	49 6 48·537	4·8745470,1	74911·24	14·188
190		L (Nallakŏnda)	·462	+ ·292	+ ·073		+ ·365	76 53 2·173	4·9845407,8	96503·00	18·277
		LIV (Pothkŏnda)	·462	+ ·080	− ·058		+ ·022	54 0 9·290	4·9039927,2	80166·47	15·183
			1·385				+ ·745	180 0 0·000			
		L (Nallakŏnda)	·492	+ ·169	+ ·051		+ ·220	60 34 59·708	4·9431855,5	87737·56	16·617
191		LIV (Pothkŏnda)	·492	+ ·391	− ·061		+ ·330	71 22 0·168	4·9797495,9	95444·22	18·077
		LIII (Náwilmĕtta)	·491	+ ·055	+ ·010		+ ·065	48 3 0·124	4·8745470,1	74911·24	14·188
			1·475				+ ·615	180 0 0·000			
		XLVIII (Nágal)	·625	− ·284		+ ·090	− ·194	56 7 37·871	4·9926715,0	98326·70	18·622
	442	L (Nallakŏnda)	·625	− ·156		− ·101	− ·257	80 15 52·708	5·0671489,6	116720·98	22·106
		LI (Elangoi)	·625	+ ·185		+ ·011	+ ·196	43 36 29·421	4·9121232,1	81681·41	15·470
			1·875				− ·255	180 0 0·000			
		L (Nallakŏnda)	·491	+ ·043		− ·107	− ·064	41 29 29·335	4·8368982,3	68690·75	13·010
	443	LI (Elangoi)	·491	− ·006		+ ·071	+ ·065	67 0 18·844	4·9797495,9	95444·22	18·077
		LIII (Náwilmĕtta)	·491	+ ·206		+ ·036	+ ·242	71 30 11·821	4·9926715,0	98326·70	18·622
			1·473				+ ·243	180 0 0·000			
		LIV (Pothkŏnda)	·575	+ ·179	− ·037		+ ·142	112 59 8·767	5·1711172,2	148291·82	28·086
192		LIII (Náwilmĕtta)	·575	− ·067	+ ·067		·000	34 0 41·555	4·9547367,3	90102·48	17·065
		LVI (Adakŏnda)	·574	+ ·112	− ·030		+ ·082	33 0 9·678	4·9431855,5	87737·56	16·617
			1·724				+ ·224	180 0 0·000			
		LIII (Náwilmĕtta)	·707	+ ·280	+ ·043		+ ·323	35 51 0·966	4·9470393,7	88519·59	16·765
193		LVI (Adakŏnda)	·707	+ ·213	− ·044		+ ·169	43 0 13·902	5·0132017,5	103086·50	19·524
		LV (Lachmipuram)	·707	+ ·708	+ ·001		+ ·709	101 8 45·132	5·1711172,2	148291·82	28·086
			2·121				+ 1·201	180 0 0·000			
		LIV (Pothkŏnda)	·671	+ ·075		− ·059	+ ·016	61 38 19·355	5·0132017,6	103086·50	19·524
	444	LIII (Náwilmĕtta)	·671	+ ·213		+ ·110	+ ·323	69 51 43·132	5·0413376,4	109986·06	20·831
		LV (Lachmipuram)	·670	+ ·044		− ·051	− ·007	48 29 57·513	4·9431855,5	87737·56	16·617
			2·012				+ ·332	180 0 0·000			
		LV (Lachmipuram)	·530	+ ·302	+ ·033		+ ·335	64 19 51·495	4·9636228,3	91965·05	17·418
194		LVI (Adakŏnda)	·529	+ ·096	− ·034		+ ·062	55 29 40·553	4·9247136,0	84084·04	15·925
		LVII (Yĕdlagattu)	·530	+ ·061	+ ·001		+ ·062	60 10 27·952	4·9470393,7	88519·59	16·765
			1·589				+ ·459	180 0 0·000			
		LVI (Adakŏnda)	·565	+ ·200	− ·001		+ ·199	51 53 24·624	4·9230497,1	83762·52	15·864
195		LVII (Yĕdlagattu)	·566	+ ·109	+ ·018		+ ·127	68 21 17·061	4·9954118,0	98949·09	18·740
		LX (Parampúdi)	·565	+ ·147	− ·017		+ ·130	59 45 18·315	4·9636228,3	91965·05	17·418
			1·696				+ ·456	180 0 0·000			
		LVII (Yĕdlagattu)	·342	·000	+ ·013		+ ·013	82 40 54·451	4·9676236,8	92816·19	17·579
196		LX (Parampúdi)	·341	+ ·151	− ·007		+ ·144	33 47 46·853	4·7164401,8	52052·33	9·858
		LIX (Sudkŏnda)	·341	+ ·053	− ·006		+ ·047	63 31 18·696	4·9230497,1	83762·52	15·864
			1·024				+ ·204	180 0 0·000			
		LV (Lachipuram)	·317	+ ·210		+ ·017	+ ·227	37 55 22·720	4·7237053,1	52930·42	10·025
	445	LVII (Yĕdlagattu)	·317	+ ·351		− ·018	+ ·333	64 33 53·446	4·8908340,2	77773·93	14·730
		LVIII (Aupád)	·318	+ ·251		+ ·001	+ ·252	77 30 43·834	4·9247136,0	84084·04	15·925
			·952				+ ·812	180 0 0·000			
		LVII (Yĕdlagattu)	·217	− ·201		− ·014	− ·215	84 13 25·118	4·8475869,8	70402·32	13·334
	446	LVIII (Aupád)	·216	− ·081		+ ·016	− ·065	47 21 28·959	4·7164401,8	52052·33	9·858
		LIX (Sudkŏnda)	·216	− ·019		− ·002	− ·021	48 25 5·923	4·7237053,1	52930·42	10·025
			·649				− ·301	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Circuit	Non-circuit	Total	Corrected Plane Angle	Distance: Log. feet	Feet	Miles
			"	"	"	"	"	° ′ "			
197		LX (Parampúdi)	·362	− ·310	− ·004		− ·314	42 23 42·564	4·7977135,3	62764·42	11·887
		LIX (Sudkŏnda)	·362	+ ·108	+ ·006		+ ·114	51 59 37·172	4·8653936,1	73348·90	13·892
		LXI (Bandanchĕrla)	·363	− ·121	− ·002		− ·123	85 36 40·264	4·9676236,8	92816·19	17·579
			1·087				− ·323	180 0 0·000			
198		LIX (Sudkŏnda)	·543	− ·282	+ ·008		− ·274	73 46 42·083	5·0559412,2	113747·34	21·543
		LXI (Bandanchĕrla)	·543	− ·138	+ ·009		− ·129	74 13 41·958	5·0569190,4	114003·72	21·592
		LXIII (Dudugat)	·542	+ ·158	− ·017		+ ·141	31 59 35·959	4·7977135,3	62764·42	11·887
			1·628				− ·262	180 0 0·000			
199		LXI (Bandanchĕrla)	·555	+ ·243	+ ·002		+ ·245	34 36 9·750	4·8218498,7	66351·36	12·567
		LXIII (Dudugat)	·555	− ·171	− ·015		− ·186	68 36 33·099	5·0365942,3	108791·31	20·604
		LXV (Dálgattu)	·555	+ ·263	+ ·013		+ ·276	76 47 17·151	5·0559412,2	113747·34	21·543
			1·665				+ ·335	180 0 0·000			
200		LXIII (Dudugat)	·479	− ·070	− ·008		− ·078	62 22 28·513	4·9699789,0	93320·89	17·674
		LXV (Dálgattu)	·480	− ·020	+ ·024		+ ·004	78 34 45·244	5·0138606,4	103243·00	19·554
		LXVI (Yĕrragattu)	·479	− ·702	− ·016		− ·718	39 2 46·243	4·8218498,7	66351·36	12·567
			1·438				− ·792	180 0 0·000			
201		LXV (Dálgattu)	·547	− ·098	+ ·008		− ·090	75 37 19·003	5·0211283,0	104985·25	19·884
		LXVI (Yĕrragattu)	·546	− ·143	− ·024		− ·167	44 56 34·667	4·8840009,0	76559·82	14·500
		LXVII (Jammalavoidurgam)	·547	− ·129	+ ·016		− ·113	59 26 6·330	4·9699789,0	93320·89	17·674
			1·640				− ·370	180 0 0·000			
	447	LX (Parampúdi)	·582	+ ·265		+ ·001	+ ·266	72 22 23·644	5·0360295,1	108649·95	20·578
		LXI (Bandanchĕrla)	·582	+ ·155		− ·007	+ ·148	67 34 52·056	5·0227837,1	105386·19	19·960
		LXII (Nágaldurgam)	·581	+ ·045		+ ·006	+ ·051	40 2 44·300	4·8653936,1	73348·90	13·892
			1·745				+ ·465	180 0 0·000			
	448	LXII (Nágaldurgam)	·698	+ ·155		+ ·001	+ ·156	62 18 23·838	5·0201753,6	104755·15	19·840
		LXI (Bandanchĕrla)	·698	+ ·057		− ·005	+ ·052	51 0 16·864	4·9635440,1	91948·36	17·414
		LXIV (Inuprâyi)	·699	+ ·013		+ ·004	+ ·017	66 41 19·298	5·0360295,1	108649·95	20·578
			2·095				+ ·225	180 0 0·000			
	449	LXI (Bandanchĕrla)	·658	− ·146		+ ·003	− ·143	46 58 15·709	4·9303499,6	85182·42	16·133
		LXIV (Inuprâyi)	·658	+ ·171		+ ·017	+ ·188	69 0 18·730	5·0365942,2	108791·31	20·604
		LXV (Dálgattu)	·658	+ ·009		− ·020	− ·011	64 1 25·561	5·0201753,6	104755·15	19·840
			1·974				+ ·034	180 0 0·000			
	450	LXIV (Inuprâyi)	·466	− ·116		+ ·008	− ·108	52 43 19·916	4·8840009,0	76559·82	14·500
		LXV (Dálgattu)	·467	+ ·026		− ·025	+ ·001	64 59 10·334	4·9404739,6	87191·46	16·514
		LXVII (Jammalavoidurgam)	·467	+ ·060		+ ·017	+ ·077	62 17 29·750	4·9303499,6	85182·42	16·133
			1·400				− ·030	180 0 0·000			
202		LXVII (Jammalavoidurgam)	·529	− ·124	+ ·012		− ·112	39 26 50·439	4·8419483,6	69494·17	13·162
		LXVI (Yĕrragattu)	·530	− ·354	− ·030		− ·384	66 50 32·666	5·0024395,6	100563·30	19·046
		LXVIII (Jujúrdurgam)	·530	− ·343	+ ·018		− ·325	73 42 36·895	5·0211283,0	104985·25	19·884
			1·589				− ·821	180 0 0·000			
203		LXVI (Yĕrragattu)	·321	+ ·173	− ·015		+ ·158	80 22 51·057	4·9213768,1	83440·48	15·803
		LXVIII (Jujúrdurgam)	·320	+ ·117	+ ·035		+ ·152	44 25 8·892	4·7725633,6	59232·95	11·218
		LXIX (Bĕzváda)	·320	− ·039	− ·020		− ·059	55 12 0·051	4·8419483,6	69494·17	13·162
			·961				+ ·251	180 0 0·000			
204		LXIX (Bĕzváda)	·350	− ·006	− ·014		− ·020	55 38 54·200	4·8513700,1	71018·26	13·450
		LXVIII (Jujúrdurgam)	·350	− ·031	+ ·027		− ·004	48 25 18·006	4·8085355,2	64348·06	12·187
		LXXI (Anantavaram)	·350	− ·083	− ·013		− ·096	75 55 47·794	4·9213768,1	83440 48	15·803
			1·050				− ·120	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			"	"	"	"	"	° ′ "			
205		LXVIII (Jujúrdurgam)	·403	+ ·020	+ ·008		+ ·028	66 13 54·875	4·9129702,2	81840·87	15·500
		LXXI (Anantavaram)	·402	+ ·009	− ·038		− ·029	61 11 31·329	4·8940845,3	78358·22	14·841
		LXXII (Chintalapád)	·402	− ·132	+ ·030		− ·102	52 34 33·796	4·8513700,1	71018·26	13·450
			1·207				− ·103	180 0 0·000			
	451	LXVII (Jammalavoidurgam)	·576	+ ·117		+ ·015	+ ·132	44 31 29·426	4·8886833,9	77389·75	14·657
		LXVIII (Jujúrdurgam)	·577	+ ·315		− ·043	+ ·272	69 48 16·845	5·0152741,8	103579·59	19·617
		LXX (Jŏnnalagadda)	·577	+ ·298		+ ·028	+ ·326	65 40 13·729	5·0024395,6	100563·30	19·046
			1·730				+ ·730	180 0 0·000			
	452	LXVIII (Jujúrdurgam)	·403	+ ·162		− ·045	+ ·117	57 24 41·904	4·8739742,9	74812·52	14·169
		LXX (Jŏnnalagadda)	·404	− ·041		+ ·017	− ·024	61 56 41·112	4·8940845,3	78358·22	14·841
		LXXII (Chintalapád)	·403	+ ·179		+ ·028	+ ·207	60 38 36·984	4·8886833,9	77389·75	14·657
			1·210				+ ·300	180 0 0·000			
206		LXXII (Chintalapád)	·324	+ ·487	+ ·006		+ ·493	51 35 51·699	4·8159660,3	65458·50	12·397
		LXXI (Anantavaram)	·323	+ ·179	− ·035		+ ·144	49 56 19·091	4·8056969,0	63928·85	12·108
		LXXIII (Lagadapád)	·324	+ ·135	+ ·029		+ ·164	78 27 49·210	4·9129702,2	81840·87	15·500
			·971				+ ·801	180 0 0·000			
207		LXXI (Anantavaram)	·323	+ ·242	− ·021		+ ·221	87 5 20·728	4·9453856,3	88183·15	16·701
		LXXIII (Lagadapád)	·322	+ ·196	+ ·041		+ ·237	45 3 53·605	4·7959226,3	62506·13	11·838
		LXXIV (Gorantla)	·323	+ ·070	− ·020		+ ·050	47 50 45·667	4·8159660,3	65458·50	12·397
			·968				+ ·508	180 0 0·000			
208		LXXIV (Gorantla)	·407	+ ·139	− ·024		+ ·115	67 45 23·218	4·9388129,9	86858·64	16·450
		LXXIII (Lagadapád)	·406	+ ·255	+ ·039		+ ·294	42 14 33·858	4·7999432,6	63087·49	11·948
		X (Ádamsáb)	·407	+ ·086	− ·015		+ ·071	70 0 2·924	4·9453856,3	88183·15	16·701
			1·220				+ ·480	180 0 0·000			
209		LXXIII (Lagadapád)	·378	+ ·067	+ ·009		+ ·076	80 12 16·558	4·9773948,8	94928·13	17·979
		X (Ádamsáb)	·377	+ ·020	− ·045		− ·025	35 25 8·358	4·7468646,8	55829·63	10·574
		VII (Dhúlipalla)	·377	− ·005	+ ·036		+ ·031	64 22 35·084	4·9388129,9	86858·64	16·450
			1·132				+ ·082	180 0 0·000			
	453	LXXII (Chintalapád)	·300	− ·206		+ ·009	− ·197	64 23 49·153	4·8395110,4	69105·24	13·088
		LXXIII (Lagadapád)	·299	− ·167		− ·064	− ·231	59 3 51·410	4·8177540,8	65728·56	12·449
		LXXV (Chikri)	·299	− ·269		+ ·055	− ·214	56 32 19·437	4·8056969,0	63928·85	12·108
			0·898				− ·642	180 0 0·000			
	454	LXXIII (Lagadapád)	·249	+ ·064		− ·054	+ ·010	54 57 33·381	4·7 6721,2	58839·92	11·144
		LXXV (Chikri)	·249	− ·063		+ ·005	− ·058	50 58 25·133	4·7468646,8	55829·63	10·574
		VII (Dhúlipalla)	·250	− ·023		+ ·049	+ ·026	74 4 1·486	4·8395110,4	69105·24	13·088
			·748				− ·022	180 0 0·000			

June, 1887.

W. H. COLE,
In charge of Computing Office.

MADRAS MERIDIONAL AND COAST SERIES.

PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
75	XII (Kándágatla)	17 17 31·31	79 39 43·95	254 48 12·26	5·0427993,1	74 53 39·87	XV (Adáligat)
„	„ „	„	„	303 51 53·27	5·1907564,8	123 58 25·39	I (Anantagiri)
„	„ „	„	„	339 27 26·29	5·0133926,4	159 29 16·33	II (Niálamari)
	XV (Adáligat)	17 22 17·31	79 58 3·69	349 8 9·90	5·0701298,8	169 9 17·47	I (Anantagiri)
	„ „	„	„	29 20 56·35	5·1579209,1	209 17 21·47	II (Niálamari)
	I (Anantagiri)	17 3 12·84	80 1 52·03	83 52 33·35	4·9693784,4	263 47 53·48	„ „
	„ „	„	„	349 21 6·03	5·1149724,6	169 22 17·96	III (Miádarsál)
	„ „	„	„	31 19 22·84	5·1905323,8	211 15 22·11	IV (Sárangapalle)
76	II (Niálamari)	17 1 33·63	79 45 56·96	315 15 37·20	5·2203028,8	135 21 26·13	III (Miádarsál)
„	„ „	„	„	354 18 31·47	5·0903222,5	174 19 7·90	IV (Sárangapalle)
	III (Miádarsál)	16 42 2·92	80 5 59·79	87 36 35·56	5·0203045,3	267 31 26·11	„ „
	„ „	„	„	22 32 57·54	4·8708078,7	202 31 33·87	V (Kachalboru)
	„ „	„	„	316 24 34·15	4·7343008,8	136 26 24·32	VI (Voruvakallu)
77	IV (Sárangapalle)	16 41 18·81	79 48 2·58	310 1 58·67	4·9985399,2	130 5 42·78	V (Kachalboru)
„	„ „	„	„	339 25 52·94	5·0883393,1	159 27 58·79	VIII (Mániam)
	V (Kachalboru)	16 30 42·71	80 1 7·02	245 59 36·61	4·8579498,5	66 2 49·58	VI (Voruvakallu)
	„ „	„	„	305 51 45·97	4·6920042,8	125 53 42·15	VII (Dhúlipalla)
	„ „	„	„	33 21 14·14	4·7823253,1	213 19 37·30	VIII (Mániam)
	VI (Voruvakallu)	16 35 33·29	80 12 24·38	24 7 52·10	4·8041591,5	204 6 36·03	VII (Dhúlipalla)
107	VII (Dhúlipalla)	16 25 56·75	80 7 56·77	73 27 43·89	4·8828335,6	253 24 11·57	VIII (Mániam)

NOTE.—Stations XII (Kándágatla) and XV (Adáligat) appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
107	VII (Dhúlipalla)	16 25 56·75	80 7 56·77	10 17 48·36	5·0149209,5	190 16 55·11	IX (Kotapa)
„	„ „	„	„	313 8 2·82	4·9773948,8	133 11 22·94	X (Ádamsáb)
„	„ „	„	„	248 45 27·36	4·7468646,8	68 47 58·91	LXXIII (Lagadapád)
„	„ „	„	„	174 41 25·62	4·7696721,2	354 41 9·71	LXXV (Chikri)
78	VIII (Mániam)	16 22 20·85	79 55 24·88	325 36 44·18	4·9867202,0	145 39 21·57	IX (Kotapa)
„	„ „	„	„	31 51 11·51	5·0710457,5	211 48 13·27	XI (Yĕrrakŏnda)
	IX (Kotapa)	16 9 6·95	80 4 46·95	247 10 10·26	4·9787477,8	67 14 21·67	X (Ádamsáb)
	„ „	„	„	80 20 17·31	5·0741933,7	260 14 44·14	XI (Yĕrrakŏnda)
	„ „	„	„	293 2 1·73	4·9576041,8	113 5 59·16	XII (Pálapáru)
	„ „	„	„	336 22 18·82	4·9090534,1	156 23 50·95	XIII (Babbĕpalle)
	„ „	„	„	24 36 20·48	4·9408003,3	204 34 37·57	XIV (Dánapa)
	X (Ádamsáb)	16 15 12·81	80 19 47·94	3 27 49·06	4·8607152,1	183 27 36·55	XII (Pálapáru)
	„ „	„	„	168 36 31·67	4·9388129,9	348 35 41·97	LXXIII (Lagadapád)
	„ „	„	„	238 36 35·00	4·7999432,6	58 39 10·23	LXXIV (Gorantla)
79	XI (Yĕrrakŏnda)	16 5 48·57	79 44 47·31	306 18 8·73	5·0006504,3	126 21 56·97	XIV (Dánapa)
	XII (Pálapáru)	16 3 14·55	80 19 2·98	52 46 6·13	4·8065969,9	232 43 42·01	XIII (Babbĕpalle)
	XIII (Babbĕpalle)	15 56 50·01	80 10 20·16	85 50 55·56	4·8389852,2	265 47 41·78	XIV (Dánapa)
	„ „	„	„	29 8 16·68	4·9521601,5	209 6 14·79	XV (Medaramĕtla)
	„ „	„	„	343 35 14·98	5·0011834,8	163 36 34·03	XVI (Faranguldinne)
80	XIV (Dánapa)	15 56 0·14	79 58 34·57	340 56 21·76	4·8890840,8	160 57 32·43	XV (Medaramĕtla)
„	„ „	„	„	62 57 18·01	4·9226888,4	242 53 49·05	XVII (Pĕddakaltippa)
81	XV (Medaramĕtla)	15 43 54·04	80 2 53·59	283 58 38·55	4·8701151,3	104 1 57·97	XVI (Faranguldinne)
„	„ „	„	„	109 25 12·79	5·0246808,4	289 20 34·69	XVII (Pĕddakaltippa)
„	„ „	„	„	352 4 3·57	4·9306122,3	172 4 35·95	XVIII (Ongole)
„	„ „	„	„	57 26 49·31	4·8763673,2	237 23 53·98	XIX (Chemakurti)
	XVI (Faranguldinne)	15 40 56·08	80 15 10·19	42 12 5·73	4·9528020,2	222 9 20·09	XVIII (Ongole)
	XVII (Pĕddakaltippa)	15 49 42·39	79 45 50·95	334 13 22·76	4·9241671,9	154 15 4·05	XIX (Chemakurti)
	XVIII (Ongole)	15 29 56·85	80 4 53·90	120 19 2·46	4·9398721,5	300 15 36·13	„ „
	„ „	„	„	61 34 18·02	4·9644198,2	241 30 37·54	XX (Netivaripálĕm)
	„ „	„	„	13 25 40·35	4·9873768,1	193 24 39·28	XXI (Puripád)
82	XIX (Chemakurti)	15 37 12·36	79 52 4·69	3 45 40·25	4·9445256,5	183 45 24·48	XX (Netivaripálĕm)
„	„ „	„	„	66 42 8·65	4·9777829,9	246 38 9·09	XXII (Nishánkŏnda)
83	XX (Netivaripálĕm)	15 22 41·44	79 51 5·67	310 49 25·82	4·8883723,9	130 52 3·65	XXI (Puripád)
„	„ „	„	„	121 38 58·17	4·9810701,9	301 35 16·14	XXII (Nishánkŏnda)
„	„ „	„	„	57 51 12·52	5·0851272,2	237 46 35·11	XXIII (Pichĕrla)
„	„ „	„	„	22 23 0·83	5·0506028,4	202 21 6·06	XXIV (Kuchĕrla)
	XXI (Puripád)	15 14 19·84	80 1 3·47	62 16 39·76	5·0587648,0	242 12 9·11	„ „
	„ „	„	„	13 29 58·97	4·9313501,0	193 29 5·90	XXV (Darutippa)
	XXII (Nishánkŏnda)	15 30 59·19	79 37 12·06	10 32 5·13	5·0680326,0	190 31 7·28	XXIII (Pichĕrla)
	XXIII (Pichĕrla)	15 11 58·80	79 33 33·66	302 57 38·74	4·8563112,2	123 0 19·48	XXIV (Kuchĕrla)

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	XXIII (Pichĕrla)	15 11 58·80	79 33 33·66	0 31 18·38	4·9644429,2	180 31 16·15	XXVII (Chákalakŏnda)
84	XXIV (Kuchĕrla)	15 5 30·99	79 43 48·90	290 0 15·86	4·9379449,6	110 3 51·70	XXV (Darutippa)
”	” ”	”	”	324 46 26·72	4·9038126,4	144 48 28·75	XXVI (Kesavaram)
”	” ”	”	”	49 4 47·31	4·9080865,4	229 2 5·66	XXVII (Chákalakŏnda)
	XXV (Darutippa)	15 0 36·47	79 57 40·10	44 35 57·42	4·7009972,4	224 34 24·54	XXVI (Kesavaram)
	XXVI (Kesavaram)	14 54 41·65	79 51 40·34	96 38 57·15	5·0337848,9	276 34 15·00	XXVII (Chákalakŏnda)
	” ”	”	”	44 48 18·67	5·0156756,0	224 45 8·36	XXVIII (Rájalli)
	” ”	”	”	333 4 34·02	4·9419602,9	153 6 17·17	XXIX (Nishánbodu)
85	XXVII (Chákalakŏnda)	14 56 45·05	79 33 25·10	338 11 35·75	4·9668800,0	158 13 5·50	XXVIII (Rájalli)
”	” ”	”	”	47 0 48·11	5·0967504,6	226 56 49·72	XXX (Yĕrrakŏnda)
86	XXVIII (Rájalli)	14 42 31·78	79 39 15·85	272 12 30·38	5·0521689,4	92 17 21·79	XXIX (Nishánbodu)
”	” ”	”	”	90 24 8·63	5·0997771,6	270 18 43·05	XXX (Yĕrrakŏnda)
”	” ”	”	”	331 33 17·46	5·0218579,3	151 35 25·81	XXXI (Kistama)
”	” ”	”	”	25 8 34·96	5·0863691,3	205 6 22·38	XXXII (Pallakŏnda)
	XXIX (Nishánbodu)	14 41 47·90	79 58 24·01	35 27 56·43	5·0337698,9	215 25 15·80	XXXI (Kistama)
	XXX (Yĕrrakŏnda)	14 42 39·56	79 17 53·66	326 18 6·16	5·1260348,4	146 21 15·86	XXXII (Pallakŏnda)
	XXXI (Kistama)	14 27 14·56	79 47 45·69	80 1 58·28	5·0149384,6	259 57 39·79	” ”
	” ”	”	”	12 7 2·04	4·9003831,6	192 6 19·99	XXXIII (Vutukúr)
	” ”	”	”	310 22 23·90	4·9269559,9	130 25 6·54	XXXIV (Bandalduru)
87	XXXII (Pallakŏnda)	14 24 16·25	79 30 28·35	304 59 6·27	5·0176238,0	125 2 40·90	XXXIII (Vutukúr)
”	” ”	”	”	359 10 45·97	4·9278563,6	179 10 49·01	XXXV (Pálchĕrla)
	XXXIII (Vutukúr)	14 14 23·59	79 44 55·99	254 9 44·61	4·9256896,2	74 13 7·90	XXXIV (Bandalduru)
	” ”	”	”	73 31 17·47	4·9431966,1	253 27 47·58	XXXV (Pálchĕrla)
	” ”	”	”	11 45 22·05	4·9289466,5	191 44 39·16	XXXVI (Kayyúr)
	” ”	”	”	331 17 54·67	4·9748711,3	151 19 47·04	XXXVII (Gurramkŏnda)
	XXXIV (Bandalduru)	14 18 11·30	79 58 40·64	18 43 45·06	5·0478926,1	198 42 15·98	” ”
	” ”	”	”	344 0 36·87	5·0300653,7	164 1 50·24	XXXVIII (Gudali)
88	XXXV (Pálchĕrla)	14 10 16·32	79 30 40·68	311 0 34·48	4·9476785,5	131 3 19·93	XXXVI (Kayyúr)
89	XXXVI (Kayyúr)	14 0 39·10	79 42 0·25	269 40 23·58	4·7967484,6	89 42 57·60	XXXVII (Gurramkŏnda)
”	” ”	”	”	340 31 12·16	4·7765867,2	160 32 0·90	XL (Pillimedu)
	XXXVII (Gurramkŏnda)	14 0 42·41	79 52 36·42	267 35 21·39	4·8157814,0	87 38 2·23	XXXVIII (Gudali)
	” ”	”	”	323 2 22·41	4·9689358,2	143 4 38·98	XXXIX (Ánĕpúdi)
	” ”	”	”	37 0 29·18	4·8511842,3	260 58 44·73	XL (Pillimedu)
	XXXVIII (Gudali)	14 1 9·45	80 3 40·54	6 59 22·89	4·8904856,1	186 58 59·81	XXXIX (Ánĕpúdi)
	XXXIX (Ánĕpúdi)	13 48 24·40	80 2 4·56	100 12 18·38	5·0012144,8	280 8 18·86	XL (Pillimedu)
	” ”	”	”	28 50 59·40	4·9839149,5	208 49 7·82	XLI (Kambákamdurgam)
	” ”	”	”	310 10 57·07	4·9629578,3	130 13 45·89	XLII (Jonangipálĕm)
90	XL (Pillimedu)	13 51 20·05	79 45 22·64	332 52 20·86	5·0596823,0	152 54 26·62	XLI (Kambákamdurgam)
”	” ”	”	”	46 8 7·48	4·8643495,7	226 5 59·94	XLIII (Yerpet)
	XLI (Kambákamdurgam)	13 34 27·10	79 54 13·09	257 47 57·51	5·0767564,4	77 52 35·87	XLII (Jonangipálĕm)

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	XLI (Kambákamdurgam)	13 34 27·10	79 54 13·09	116 6 16·05	5·0680779,4	296 2 4·64	XLIII (Yerpet)
	" "	"	"	294 50 49·54	5·0802490,7	114 55 7·86	XLIV (Rĕttambedu)
	" "	"	"	53 14 49·24	5·0726030,2	233 11 5·63	XXXIII (Nagari)
	" "	"	"	340 18 30·54	5·0882262,6	160 20 7·54	XXXV (Chĕmbedu)
	XLII (Jonangipálĕm)	13 38 36·46	80 13 56·10	5 42 45·61	4·8815827,3	185 42 27·64	XLIV (Rĕttambedu)
91	XLIII (Yerpet)	13 42 56·96	79 36 27·39	355 5 41·09	5·0885927,7	175 6 5·97	XXXIII (Nagari)
	XLIV (Rĕttambedu)	13 26 5·04	80 12 39·30	46 23 36·13	4·9724256,0	226 20 57·29	XXXV (Chĕmbedu)
92	XXXIII (Nagari)	13 22 45·08	79 38 13·62	288 6 35·92	5·1557144,3	108 11 53·24	" "
	XXXV (Chĕmbedu)	13 15 22·76	80 1 11·17				
94	XXXIX (Dhár)	17 43 59·10	82 30 54·99	315 34 22·14	5·0307325,3	135 38 17·28	XLI (Sánjib)
"	" "	"	"	34 45 50·13	4·9650817,5	214 43 5·45	XLV (Gundálamma)
"	" "	"	"	101 56 59·30	4·8965786,0	281 52 55·96	XLVII (Pagulráyi)
	XLI (Sánjib)	17 31 18·68	82 43 51·48	90 26 40·74	5·1063620,1	270 20 3·22	XLV (Gundálamma)
	" "	"	"	47 41 24·70	5·0028595,6	227 37 34·51	XLVI (Kappakŏnda)
95	XLV (Gundálamma)	17 31 27·28	82 21 51·21	322 6 3·73	4·9394926,4	142 8 48·99	" "
"	" "	"	"	165 4 6·35	4·9791881,6	345 2 49·27	XLVII (Pagulráyi)
"	" "	"	"	39 42 27·28	4·8948934,4	219 39 52·06	XLVIII (Nágal)
"	" "	"	"	105 7 5·36	4·8750442,9	285 3 19·65	XLIX (Kalimámidi)
	XLVI (Kappakŏnda)	17 20 6·41	82 31 2·93	94 36 1·66	5·0167005,1	274 30 42·76	XLVIII (Nágal)
	XLVII (Pagulráyi)	17 46 40·44	82 17 37·02	33 22 58·83	4·9390043,6	213 20 28·73	XLIX (Kalimámidi)
	XLVIII (Nágal)	17 21 28·27	82 13 13·34	164 24 26·82	4·9190357,2	344 23 17·59	" "
	" "	"	"	76 5 21·04	4·9121232,1	256 1 17·24	L (Nallakŏnda)
	" "	"	"	19 57 42·54	5·0671489,6	199 55 41·02	LI (Elangoi)
96	XLIX (Kalimámidi)	17 34 40·83	82 9 22·73	29 45 35·15	5·0596540,8	209 42 38·97	L (Nallakŏnda)
"	" "	"	"	73 30 59·11	4·9746393,6	253 26 17·39	LII (Kappa)
	L (Nallakŏnda)	17 18 13·09	81 59 34·91	336 17 10·57	4·9926715,0	156 19 10·98	LI (Elangoi)
	" "	"	"	155 14 43·23	4·9039927,2	335 12 59·47	LII (Kappa)
	" "	"	"	17 46 40·40	4·9797495,9	197 45 11·67	LIII (Náwilmĕtta)
	" "	"	"	78 21 40·60	4·8745470,1	258 17 55·64	LIV (Pothkŏnda)
	LI (Elangoi)	17 3 20·33	82 6 22·56	89 18 51·64	4·8368982,3	269 15 23·98	LIII (Náwilmĕtta)
97	LII (Kappa)	17 30 14·84	81 53 48·02	24 19 48·47	4·9845407,8	204 17 45·89	LIV (Pothkŏnda)
	LIII (Náwilmĕtta)	17 3 11·84	81 54 34·49	149 42 11·05	4·9431855,5	329 39 56·30	" "
	" "	"	"	79 50 27·25	5·0132017,5	259 45 21·01	LV (Lachmipuram)
	" "	"	"	115 41 28·92	5·1711172,2	295 34 42·52	LVI (Adakŏnda)
98	LIV (Pothkŏnda)	17 15 42·85	81 46 57·70	31 18 16·32	5·0413376,4	211 15 22·83	LV (Lachmipuram)
"	" "	"	"	82 39 5·64	4·9547367,3	262 34 32·26	LVI (Adakŏnda)
	LV (Lachmipuram)	17 0 10·80	81 37 8·74	158 36 35·17	4·9470393,7	338 34 57·13	" "
	" "	"	"	94 16 43·15	4·9247136,0	274 12 30·30	LVII (Yĕdlagattu)
	" "	"	"	56 21 20·11	4·8908340,2	236 18 5·77	LVIII (Aupád)
99	LVI (Adakŏnda)	17 13 47·99	81 31 35·61	34 4 38·21	4·9636228,3	214 2 1·82	LVII (Yĕdlagattu)

NOTE.—Stations XXXIII (Nagari) and XXXV (Chĕmbedu) appertain to the Madras Longitudinal Series, and XXXIX (Dhár) and XLI (Sánjib) to the Bider Longitudinal Series of the South-East Quadrilateral.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
99	LVI (Adakŏnda)	17 13 47·99	81 31 35·61	85 58 3·40	4·9954118,0	265 53 1·91	LX (Parampúdi)
	LVII (Yĕdlagattu)	17 1 12·49	81 22 44·51	338 46 24·06	4·7237053,1	158 47 21·61	LVIII (Aupád)
	„ „	„	„	62 59 49·40	4·7164401,8	242 57 29·79	LIX (Sudkŏnda)
	„ „	„	„	145 40 44·19	4·9230497,1	325 38 20·79	LX (Parampúdi)
	LVIII (Aupád)	16 53 3·22	81 26 1·89	111 25 52·44	4·8475869,8	291 22 35·93	LIX (Sudkŏnda)
	LIX (Sudkŏnda)	16 57 17·99	81 14 46·66	179 26 10·75	4·9676236,8	359 26 7·98	LX (Parampúdi)
	„ „	„	„	127 26 33·22	4·7977135,3	307 24 2·95	LXI (Bandanchĕrla)
	„ „	„	„	53 39 50·59	5·0569190,4	233 35 16·39	LXIII (Dudugat)
100	LX (Parampúdi)	17 12 38·28	81 14 37·24	41 49 50·91	4·8653936,1	221 47 22·32	LXI (Bandanchĕrla)
„	„ „	„	„	114 12 15·14	5·0227837,1	294 7 20·53	LXII (Nágaldurgam)
101	LXI (Bandanchĕrla)	17 3 36·18	81 6 12·93	154 12 29·69	5·0360295,1	334 10 5·41	„ „
„	„ „	„	„	21 37 45·45	5·0559412,2	201 35 39·89	LXIII (Dudugat)
„	„ „	„	„	103 12 12·12	5·0201753,6	283 7 2·99	LXIV (Inupráyi)
„	„ „	„	„	56 13 55·76	5·0365942,3	236 9 23·77	LXV (Dálgattu)
	LXII (Nágaldurgam)	17 19 46·02	80 58 4·87	36 28 29·94	4·9635440,1	216 25 42·99	LXIV (Inupráyi)
	LXIII (Dudugat)	16 46 7·57	80 59 1·36	132 59 6·24	4·8218498,7	312 56 41·48	LXV (Dálgattu)
	„ „	„	„	70 36 37·25	5·0138606,4	250 31 48·97	LXVI (Yĕrragattu)
	LXIV (Inupráyi)	17 7 32·67	80 48 41·18	352 7 22·38	4·9303499,6	172 7 57·55	LXV (Dálgattu)
	„ „	„	„	44 50 42·76	4·9404739,6	224 47 37·10	LXVII (Jammalavoidurgam)
102	LXV (Dálgattu)	16 53 35·99	80 50 41·42	31 31 27·20	4·9699789,0	211 29 2·24	LXVI (Yĕrragattu)
„	„ „	„	„	107 8 46·75	4·8840009,0	287 5 7·32	LXVII (Jammalavoidurgam)
	LXVI (Yĕrragattu)	16 40 27·02	80 42 19·42	166 32 27·03	5·0211283,0	346 31 14·20	„ „
	„ „	„	„	99 41 53·83	4·8419483,6	279 38 31·39	LXVIII (Jujúrdurgam)
	„ „	„	„	19 19 2·46	4·7725633,6	199 18 4·92	LXIX (Bĕzváda)
103	LXVII (Jammalavoidurgam)	16 57 19·41	80 38 7·65	25 58 5·16	5·0024395,6	205 55 53·97	LXVIII (Jujúrdurgam)
„	„ „	„	„	70 29 35·17	5·0152741,8	250 24 42·75	LXX (Jŏnnalagadda)
104	LXVIII (Jujúrdurgam)	16 42 22·77	80 30 34·55	324 3 40·61	4·9213768,1	144 6 4·55	LXIX (Bĕzváda)
„	„ „	„	„	136 7 36·55	4·8886833,9	316 4 57·05	LXX (Jŏnnalagadda)
„	„ „	„	„	12 28 58·96	4·8513700,1	192 28 13·85	LXXI (Anantavaram)
„	„ „	„	„	78 42 54·24	4·8940845,3	258 39 7·27	LXXII (Chintalapád)
	LXIX (Bĕzváda)	16 31 12·70	80 38 57·99	88 27 10·00	4·8085355,2	268 24 2·00	LXXI (Anantavaram)
	LXX (Jŏnnalagadda)	16 51 35·76	80 21 22·19	18 1 38·57	4·8739742,9	198 0 29·88	LXXII (Chintalapád)
	LXXI (Anantavaram)	16 30 55·18	80 27 56·75	131 16 42·12	4·9129702,2	311 13 41·46	„ „
	„ „	„	„	81 20 22·71	4·8159660,3	261 17 13·78	LXXIII (Lagadapád)
	„ „	„	„	354 15 1·66	4·7959226,3	174 15 19·85	LXXIV (Gorantla)
105	LXXII (Chintalapád)	16 39 50·30	80 17 24·01	2 49 33·49	4·8056969,0	182 49 24·25	LXXIII (Lagadapád)
„	„ „	„	„	67 13 22·94	4·8177540,8	247 10 24·59	LXXV (Chikri)
106	LXXIII (Lagadapád)	16 29 17·14	80 16 51·61	306 21 7·71	4·9453856,3	126 24 33·86	LXXIV (Gorantla)
„	„ „	„	„	123 45 32·54	4·8395110,4	303 42 44·32	LXXV (Chikri)
	LXXIV (Gorantla)	16 20 38·46	80 29 1·06				
	LXXV (Chikri)	16 35 37·71	80 7 0·77				

October, 1889.

W. H. COLE,
In charge of Computing Office.

MADRAS MERIDIONAL AND COAST SERIES.

PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.

The following table gives, first, the usual data of the observed vertical angles and the heights of the signal and instrument, &c., in pairs of horizontal lines, the first line of which gives the data for the 1st or the fixed station, and the second line the data for the 2nd or the deduced station. This is followed by the arc contained between the two stations, and then by the terrestrial refraction and the height of the 2nd station above or below the 1st, as computed from the vertical angles in the usual manner. This difference of height applied to the given height above mean sea level of the fixed station, gives that of the deduced station. Usually there are two or three independent values of the height of the deduced station; the details are so arranged as to show these consecutively and their mean in the columns of "Trigonometrical Results." The mean results thus obtained are however liable to receive corrections for the errors generated in the trigonometrical operations, which are shown up by the spirit levelling operations, wherever a junction between the two has been effected. The spirit levelled determinations are always accepted as final, and the trigonometrical heights of stations lying between those fixed by the levelling operations are adjusted by simple proportion to accord with the latter. In the table the spirit levelled values are printed thus, 48·06, &c., to distinguish them from the adjusted trigonometrical values. The column in which the mean trigonometrical heights are given is barred across where necessary, as after deduction of Stn. XII from Stn. X, page 117—E., to indicate that one set of adjustments ends and another begins. The trigonometrical heights always refer to the upper mark or to the upper surface of the pillar or structure on which the theodolite stood. Descriptions follow this table, exactly indicating the surfaces on which the levelling staff stood during the determinations of the spirit levelled heights.

When the pillar of the station is perforated, the height given in the last column is that between the upper surface of pillar and the ground level mark-stone in the floor of the passage; otherwise, it is the approximate height of the structure above the ground at the base of the station.

The initial stations of this series are Kándágatla, Adáligat, Dhár and Sánjib of the Bider Longitudinal Series. The heights above Mean Sea Level are given on pages 95—D. and 96—D. of Vol. VI of the *Account of the Operations, &c.*; those of the two former have been corrected by − 6·1 and − 5·8 feet respectively to agree with the values of the Bider Base-line stations as determined by spirit-levelling operations in 1880: the heights of the two latter required no correction. The heights now accepted are as follows:—

XII (Kándágatla) 1646·9 feet; XXXIX (Dhár) 4093·0 feet;
XV (Adáligat) 971·2 „ XLI (Sánjib) 2142·0 „

Astronomical Date 1868		Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
		h m		° ′ ″				″							feet
Mar.	20	2 38	XII (Kándágatla)	D 0 29 34·6	4	2·7	5·2	1534	96	·062	−827·4	819·5			
„	30	2 37	I (Anantagiri)	E 0 7 5·1	4	2·7	5·2								
„	25	2 3	XV (Adáligat)	D 0 13 6·5	4	2·7	5·2	1162	66	·057	−152·1	819·1	819·2	819	2·8
„	30	2 3	I (Anantagiri)	D 0 4 12·7	4	2·7	5·2								

NOTE.—Stations XII (Kándágatla) and XV (Adáligat) appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

Astronomical Date 1868	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Apr. 8	2 17	II (Niálamari)	D 0 18 45·2	4	2·7	5·2	921	57	·061	− 323·3	819·1			
Mar. 30	2 14	I (Anantagiri)	E 0 5 5·8	4	2·7	5·2								
„ 20	2 46	XII (Kándágatla)	D 0 24 24·1	4	2·7	5·2	1020	61	·060	− 505·3	1141·6			
Apr. 8	2 50	II (Niálamari)	E 0 9 16·9	4	2·7	5·2								
Mar. 25	2 38	XV (Adáligat)	D 0 6 24·7	4	2·7	5·2	1422	83	·059	+ 171·9	1143·1	1142·4	1142	2·0
Apr. 8	2 43	II (Niálamari)	D 0 14 37·6	4	2·7	5·2								
Mar. 30	2 14	I (Anantagiri)	E 0 5 5·8	4	2·7	5·2	921	57	·061	+ 323·3	1142·6			
Apr. 8	2 17	II (Niálamari)	D 0 18 45·2	4	2·7	5·2								
Mar. 31	2 14	I (Anantagiri)	E 0 10 19·6	4	2·6	5·2	1288	77	·060	+ 752·3	1571·5			
Apr. 9	2 15	III (Miádarsál)	D 0 29 21·9	4	2·7	5·3								
„ 8	2 34	II (Niálamari)	D 0 3 11·4	4	2·6	5·2	1642	100	·061	+ 428·8	1571·2	1572·5	1573	1·2
„ 9	2 33	III (Miádarsál)	D 0 20 56·3	4	2·7	5·3								
„ 15	2 43	IV (Sárangapalle)	E 0 25 56·2	4	2·6	5·3	1036	61	·058	+1025·7	1574·8			
„ 9	2 42	III (Miádarsál)	D 0 41 21·3	4	2·7	5·3								
Mar. 31	2 30	I (Anantagiri)	D 0 17 28·1	4	2·7	5·2	1533	79	·051	− 268·5	550·7			
Apr. 15	2 31	IV (Sárangapalle)	D 0 5 34·1	4	2·7	5·3								
„ 8	2 8	II (Niálamari)	D 0 25 44·0	4	2·7	5·2	1217	66	·054	− 595·0	547·4	547·9	548	5·0
„ 15	2 3	IV (Sárangapalle)	E 0 7 29·5	4	2·7	5·3								
„ 9	2 42	III (Miádarsál)	D 0 41 21·3	4	2·7	5·3	1036	61	·058	−1025·7	545·7			
„ 15	2 43	IV (Sárangapalle)	E 0 25 56·2	4	2·6	5·3								
„ 9	2 24	III (Miádarsál)	D 0 33 13·3	4	2·7	5·3	734	43	·059	− 598·5	974·0			
„ 22	2 24	V (Kachalboru)	E 0 22 10·6	4	2·6	5·3								
„ 15	2 18	IV (Sárangapalle)	E 0 7 19·3	4	2·7	5·3	985	55	·056	+ 426·3	974·2	974·1	974	2·0
„ 22	2 15	V (Kachalboru)	D 0 22 5·3	4	2·7	5·3								
„ 9	2 3	III (Miádarsál)	D 1 26 47·0	4	2·8	5·3	536	31	·059	−1304·9	267·6			
„ 25	2 4	VI (Voruvakallu)	E 1 18 34·6	4	2·6	5·2								
„ 22	2 34	V (Kachalboru)	D 0 39 2·8	4	2·8	5·3	713	39	·055	− 705·8	268·3	268·0	268	1·0
„ 25	2 34	VI (Voruvakallu)	E 0 28 14·9	4	2·7	5·2								
„ 22	2 53	V (Kachalboru)	D 0 54 54·7	4	2·7	5·3	486	24	·048	− 731·1	243·0			
„ 27	3 1	VII (Dhúlipalla)	E 0 47 14·1	4	2·7	5·3								
„ 25,26	2 49	VI (Voruvakallu)	D 0 6 32·7	12	2·7	5·2	630	6	·010	− 23·5	244·5	243·8	244	5·0
„ 27	2 12	VII (Dhúlipalla)	D 0 4 0·4	4	2·8	5·3								
(1)	2 31	VIII (Mániam)	D 0 49 1·0	12	2·8	5·3	754	39	·051	− 961·1	243·8			
(2)	2 51	VII (Dhúlipalla)	E 0 37 30·9	12	2·8	5·3								
„ 15	2 54	IV (Sárangapalle)	E 0 9 18·2	4	2·7	5·3	1212	63	·052	+ 656·6	1204·5			
„ 19	2 55	VIII (Mániam)	D 0 27 31·6	4	2·7	5·3								

(1) The mean of observations taken on 8th December, 1863, and 27th April, 1868.
(2) Do. do. 10th do. 19th do.

Astronomical Date		Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet		Contained Arc	Terrestrial Refraction		Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level			Height of Pillar or Tower
1868	Mean of Times of observation				Signal	Instrument		In seconds	Decimals of Contained Arc		Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	
	h m		° ′ ″				″							feet
Apr. 22	2 44	V (Kachalboru)	E 0 8 30·3	4	2·7	5·3	599	31	·052	+ 231·2	1205·3	1204·9	1205	1·0
„ 19	2 41	VIII (Mániam)	D 0 17 43·6	4	2·7	5·3								
(1)	2 51	VII (Dhúlipalla)	E 0 37 30·9	12	2·8	5·3	754	39	·051	+ 961·1	1204·8			
(2)	2 31	VIII (Mániam)	D 0 49 1·0	12	2·8	5·3								
1863 Dec. 8	2 55	VII (Dhúlipalla)	E 0 36 55·9	8	2·8	5·4	1026	66	·065	+1338·7	1582·5			
„ 14,15	2 55	IX (Kotapa)	D 0 51 59·6	8	2·9	5·4						1582·4	1583	0·6
„ 10	2 9	VIII (Mániam)	E 0 6 19·9	8	2·8	5·4	960	63	·066	+ 377·3	1582·2			
„ 15	2 6	IX (Kotapa)	D 0 20 24·6	8	2·9	5·4								
1862 Apr. 8	1 28	VII (Dhúlipalla)	E 0 44 50·0	4	2·8	5·4	938	55	·058	+1431·5	1675·3			
„ 3,4	1 29	X (Ádamsáb)	D 0 58 49·8	8	2·9	5·3						1675·1	1675	1·0
1863 Dec. 14,15	2 30	IX (Kotapa)	D 0 3 32·1	8	2·9	5·4	939	62	·066	+ 92·6	1675·0			
„ 4,5	2 30	X (Ádamsáb)	D 0 10 13·3	8	2·8	5·4								
„ 10	3 1	VIII (Mániam)	D 0 10 28·7	8	2·9	5·4	1166	69	·060	− 63·3	1141·6			
1862 Mar. 20	2 25	XI (Yĕrrakŏnda)	D 0 6 47·0	4	2·8	5·4						1141·6	1142	1·0
1863 Dec. 15	1 46	IX (Kotapa)	D 0 21 20·2	8	2·9	5·4	1169	75	·064	− 440·8	1141·6			
1862 Mar. 19,20	1 49	XI (Yĕrrakŏnda)	E 0 4 12·4	8	2·8	5·4								
1863 Dec. 14,15	3 11	IX (Kotapa)	D 1 4 47·9	8	2·9	5·4	895	54	·060	−1534·4	48·0			
1864 Jan. 2	3 14	XII (Pálapáru)	E 0 51 29·8	8	2·8	5·4						47·9	48·06	2·0
1863 Dec. 4,5	2 45	X (Ádamsáb)	D 1 22 28·2	8	2·9	5·4	720	43	·060	−1627·3	47·8			
1864 Jan. 2	2 51	XII (Pálapáru)	E 1 11 41·1	8	2·8	5·4								
1863 Dec. 14,15	3 23	IX (Kotapa)	D 0 44 50·7	8	2·8	5·4	804	53	·066	− 918·5	664·0			
„ 30	3 23	XIII (Babbĕpalle)	E 0 33 0·6	8	2·8	5·4								
1864 Jan. 2	2 31	XII (Pálapáru)	E 0 28 8·0	8	2·9	5·4	633	34	·053	+ 614·6	662·7	663·5	664	1·0
1863 Dec. 30	2 30	XIII (Babbĕpalle)	D 0 37 49·7	8	2·9	5·4								
1862 Mar. 24,25	2 2	XIV (Dánapa)	D 0 22 19·4	8	2·9	5·4	680	42	·061	− 345·9	663·7			
1863 Dec. 30	2 4	XIII (Babbĕpalle)	E 0 12 7·6	8	2·8	5·4								
„ 14,16	2 29	IX (Kotapa)	D 0 28 56·3	8	2·9	5·4	864	57	·066	− 573·3	1009·2			
„ 27	2 29	XIV (Dánapa)	E 0 16 14·0	8	2·9	5·4								
1862 Mar. 19,20	2 14	XI (Yĕrrakŏnda)	D 0 11 48·8	8	2·8	5·4	989	62	·063	− 131·7	1010·0	1009·5	1010	1·0
„ 24,25	2 16	XIV (Dánapa)	D 0 2 46·5	8	2·8	5·4								
1863 Dec. 30	2 4	XIII (Babbĕpalle)	E 0 12 7·6	8	2·8	5·4	680	42	·061	+ 345·9	1009·3			
1862 Mar. 24,25	2 2	XIV (Dánapa)	D 0 22 19·4	8	2·9	5·4								
1863 Dec. 30	3 44	XIII (Babbĕpalle)	D 0 10 12·6	8	2·9	5·4	887	58	·065	− 96·1	567·4			
1864 Jan. 11	3 43	XV (Medaramĕtla)	D 0 2 49·8	8	2·9	5·4						567·9	568	1·0
1863 Dec. 27	1 52	XIV (Dánapa)	D 0 25 13·7	8	2·9	5·4	768	52	·067	− 441·2	568·3			
1864 Jan. 11	1 53	XV (Medaramĕtla)	E 0 13 55·8	8	2·9	5·4								

(1) The mean of observations taken on 8th December, 1863, and 27th April, 1868.
(2) Do. do. 10th do. 19th do.

Astronomical Date 1863-64		Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
		h m		° ′ ″				″							feet
Dec.	30	3 1	XIII (Babbĕpalle)	D 0 29 22·7	8	2·9	5·4	994	53	·054	− 638·8	24·7	25·0	25	2·0
Jan.	5	3 2	XVI (Faranguldinne)	E 0 14 25·4	8	2·9	5·4								
„	11	3 17	XV (Medaramĕtla)	D 0 30 18·7	8	14·2	5·4	731	31	·043	− 542·5	25·4			
„	5,6	3 15	XVI (Faranguldinne)	E 0 19 44·8	8	8·9	5·4								
Dec.	27	2 11	XIV (Dánapa)	D 0 27 53·0	8	2·9	5·4	826	54	·066	− 530·9	478·6	478·2	479	1·0
Jan.	15	2 15	XVII (Pĕddakaltippa)	E 0 15 43·4	12	2·8	5·4								
„	11	2 27	XV (Medaramĕtla)	D 0 10 32·8	8	2·9	5·4	1044	69	·066	− 90·0	477·9			
„	14	2 28	XVII (Pĕddakaltippa)	D 0 4 42·2	8	2·8	5·4								
„	11	2 11	XV (Medaramĕtla)	E 1 4 9·3	8	2·8	5·4	743	47	·063	+ 1525·0	2092·9	2092·5	2093	1·0
„	19	2 10	XIX (Chemakurti)	D 1 15 11·8	8	2·8	5·4								
„	15	2 48	XVII (Pĕddakaltippa)	E 0 59 55·7	8	2·8	5·4	832	54	·065	+ 1614·0	2092·2			
„	19	2 49	XIX (Chemakurti)	D 1 12 11·2	8	2·9	5·4								
„	11	2 50	XV (Medaramĕtla)	D 0 19 7·0	8	2·9	5·4	845	54	·063	− 319·0	248·9	249·2	249·74	2·0
„	29,31	2 51	XVIII (Ongole)	E 0 6 36·7	12	2·8	5·4								
„	8	19 57	XVI (Faranguldinne)	E 0 1 49·5	8	10·2	5·4	887	41	·047	+ 217·7	242·7*			
„	8	19 57	XVIII (Ongole)	D 0 14 52·1	8	9·8	5·2								
„	19	2 49	XIX (Chemakurti)	D 1 19 7·4	8	2·9	5·4	860	53	·062	− 1843·0	249·5			
„	29,31	2 48	XVIII (Ongole)	E 1 6 22·7	12	2·8	5·4								
„	31	2 26	XVIII (Ongole)	D 0 9 29·6	8	2·8	5·4	909	20	·022	− 57·9	191·8	188·2	188	1·0
Feb.	2,4	2 27	XX (Netivaripálĕm)	D 0 5 10·1	12	2·9	5·4								
Jan.	19	3 21	XIX (Chemakurti)	D 1 21 0·7	8	2·8	5·4	873	53	·061	− 1908·4	184·5			
Feb.	2,4	3 18	XX (Netivaripálĕm)	E 1 8 2·8	12	2·8	5·4								
Jan.	29	3 19	XVIII (Ongole)	D 0 12 6·1	8	†3·1	5·4	963	44	·046	− 127·3	122·4	121·8	121	9·0
Mar.	2,3	3 19	XXI (Puripád)	D 0 2 53·1	8	2·9	5·4								
Feb.	2,4	3 34	XX (Netivaripálĕm)	D 0 10 2·6	16	†3·1	5·4	764	− 20	·026	− 66·9	121·3			
Mar.	2,3	3 34	XXI (Puripád)	D 0 3 50·0	8	2·9	5·4								
Jan.	19	2 25	XIX (Chemakurti)	D 0 3 39·7	8	2·9	5·4	937	64	·068	+ 87·7	2180·6	2182·0	2181	1·0
„	24	2 25	XXII (Nishánkŏnda)	D 0 10 0·5	8	2·8	5·4								
Feb.	2	2 43	XX (Netivaripálĕm)	E 1 4 34·2	8	2·8	5·4	945	54	·058	+ 1995·2	2183·4			
Jan.	24	2 43	XXII (Nishánkŏnda)	D 1 18 41·5	8	2·9	5·4								
Feb.	3,4	2 20	XX (Netivaripálĕm)	E 0 21 54·8	16	2·8	5·4	1201	69	·057	+ 1091·7	1279·9	1280·4	1279	1·0
„	8,9	2 20	XXIII (Pichĕrla)	D 0 39 46·6	8	2·9	5·4								
Jan.	24	3 0	XXII (Nishánkŏnda)	D 0 34 59·8	8	2·8	5·4	1160	73	·063	− 901·0	1281·0			
Feb.	8,9	3 0	XXIII (Pichĕrla)	E 0 17 57·7	8	2·8	5·4								
„	2,4	3 0	XX (Netivaripálĕm)	E 0 2 58·1	16	2·8	5·4	1113	47	·043	+ 376·9	565·1			
Mar.	6	2 59	XXIV (Kuchĕrla)	D 0 20 5·7	8	2·9	5·4								

* Rejected.

† These heights are to be combined with negative signs because the pillar at XXI (Puripád) had a subsequent permanent addition made to it of 6 feet.

Astronomical Date 1864		Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
		h m		° ′ ″				″							feet
Mar.	2,3	2 45	XXI (Puripád)	E 0 4 52·1	8	2·7	5·4	1130	60	·052	+ 445·2	567·0	568·0	566	2·0
„	6	2 44	XXIV (Kuchĕrla)	D 0 21 51·7	8	2·8	5·4								
Feb.	8,9	2 30	XXIII (Pichĕrla)	D 0 39 17·1	8	2·8	5·4	709	39	·054	− 708·3	572·1			
Mar.	6,7	2 30	XXIV (Kuchĕrla)	E 0 28 30·4	8	2·8	5·4								
„	2,3	3 0	XXI (Puripád)	D 0 4 10·0	8	2·9	5·4	846	− 4	·005	+ 76·0	197·8			
„	10	3 1	XXV (Darutippa)	D 0 10 17·1	8	2·8	5·4						197·0	195	12·6
„	6	3 12	XXIV (Kuchĕrla)	D 0 21 14·3	8	2·9	5·4	855	44	·051	− 371·9	196·1			
„	10	3 13	XXV (Darutippa)	E 0 8 19·7	8	4·7	5·4								
„	6	3 30	XXIV (Kuchĕrla)	D 0 21 40·2	8	2·8	5·4	793	40	·051	− 364·1	203·9			
„	16,17	3 29	XXVI (Kesavaram)	E 0 9 34·5	12	2·8	5·4								
„	10	2 57	XXV (Darutippa)	D 0 4 33·1	12	2·8	5·4	497	−40	·080	+ 6·2	203·2	205·0	203	9·5
„	16,17	2 51	XXVI (Kesavaram)	D 0 5 23·3	16	2·9	5·4								
„	21	2 34	XXVII (Chákalakŏnda)	D 0 20 58·7	8	2·8	5·4	1065	42	·039	− 399·7	208·0			
„	16,17	2 45	XXVI (Kesavaram)	E 0 4 26·8	12	2·9	5·4								
Feb.	8,9	3 13	XXIII (Pichĕrla)	D 0 31 48·6	8	2·9	5·4	914	56	·061	− 671·0	609·4			
Mar.	20	3 12	XXVII (Chákalakŏnda)	E 0 18 15·5	8	2·8	5·4								
„	6	2 14	XXIV (Kuchĕrla)	D 0 4 24·6	8	2·9	5·4	800	45	·056	+ 37·9	605·9	606·2	604	2·0
„	20,21	2 14	XXVII (Chákalakŏnda)	D 0 7 37·9	8	2·8	5·4								
„	16,17	2 45	XXVI (Kesavaram)	E 0 4 26·8	12	2·9	5·4	1065	42	·039	+ 399·7	603·3			
„	21	2 34	XXVII (Chákalakŏnda)	D 0 20 58·7	8	2·8	5·4								
„	17	2 18	XXVI (Kesavaram)	E 0 3 21·1	8	2·9	5·4	1025	42	·041	+ 340·3	545·3			
„	30	2 17	XXVIII (Rájalli)	D 0 19 12·9	8	2·8	5·4						545·7	543	2·0
„	20	3 36	XXVII (Chákalakŏnda)	D 0 9 6·0	8	2·9	5·4	918	52	·057	− 60·1	546·1			
„	30	3 35	XXVIII (Rájalli)	D 0 4 38·5	8	2·9	5·4								
„	16	3 17	XXVI (Kesavaram)	D 0 5 41·6	8	2·9	5·4	867	33	·038	+ 27·5	232·5			
Apr.	5	3 20	XXIX (Nishánbodu)	D 0 7 51·6	8	2·8	5·4						231·1	228	*
Mar.	30,31	2 51	XXVIII (Rájalli)	D 0 18 4·6	8	2·9	5·4	1111	54	·048	− 316·0	229·7			
Apr.	5	2 49	XXIX (Nishánbodu)	E 0 1 11·5	8	2·9	5·4								
Mar.	21	2 54	XXVII (Chákalakŏnda)	E 0 24 20·9	8	2·8	5·4	1235	75	·061	+1216·1	1822·3			
„	24,25	2 53	XXX (Yĕrrakŏnda)	D 0 42 33·5	8	2·9	5·4						1822·1	1819	2·0
„	31	3 11	XXVIII (Rájalli)	E 0 25 41·6	8	3·0	5·4	1240	74	·060	+1276·1	1821·8			
„	25	3 10	XXX (Yĕrrakŏnda)	D 0 44 1·8	8	2·8	5·4								
Apr.	1	3 15	XXVIII (Rájalli)	D 0 10 35·7	8	2·8	5·4	1042	57	·055	− 85·4	460·3			
„	7	3 16	XXXI (Kistama)	D 0 5 0·7	8	2·9	5·4								
„	5	3 5	XXIX (Nishánbodu)	D 0 0 38·6	8	2·8	5·4	1070	58	·054	+ 232·4	463·5	461·4	458	2·6
„	8	3 3	XXXI (Kistama)	D 0 15 25·4	8	2·9	5·4								

* Not forthcoming.

Astronomical Date 1864	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Apr. 10	2 50	XXXII (Pallakŏnda)	D 0 31 25·5	8	2·8	5·4	1020	53	·052	− 714·2	460·5			
„ 8	2 49	XXXI (Kistama)	E 0 16 1·2	8	2·9	5·4								
Mar. 30,31	2 34	XXVIII (Rájalli)	E 0 8 47·8	8	2·9	5·4	1209	72	·060	+ 629·5	1175·2			
Apr. 10	2 35	XXXII (Pallakŏnda)	D 0 26 40·5	8	2·9	5·4								
Mar. 25	3 9	XXX (Yĕrrakŏnda)	D 0 26 25·4	8	2·8	5·4	1323	80	·060	− 648·0	1174·1	1175·1	1171	2·0
Apr. 10	3 9	XXXII (Pallakŏnda)	E 0 6 54·4	8	3·0	5·4								
„ 8	2 49	XXXI (Kistama)	E 0 16 1·2	8	2·9	5·4	1020	53	·052	+ 714·2	1176·1			
„ 10	2 50	XXXII (Pallakŏnda)	D 0 31 25·5	8	2·8	5·4								
Dec. 22	2 32	XXXI (Kistama)	D 0 3 16·9	8	2·6	5·3	788	51	·065	+ 59·0	520·4			
1865 Jan. 9	2 32	XXXIII (Vutukúr)	D 0 8 22·8	8	2·7	5·3								
1864 Dec. 30,31	3 41	XXXII (Pallakŏnda)	D 0 29 8·1	12	2·6	5·3	1029	67	·065	− 654·1	521·0	520·7	517	3·0
1865 Jan. 9,10	3 41	XXXIII (Vutukúr)	E 0 14 3·0	16	2·7	5·3								
1864 Dec. 22	2 57	XXXI (Kistama)	D 0 19 3·5	8	2·8	5·3	835	49	·059	− 315·0	146·4			
1865 Jan. 13	3 6	XXXIV (Bandalduru)	E 0 6 33·6	8	2·7	5·3						146·0	141·46	2·0
„ 9	3 29	XXXIII (Vutukúr)	D 0 21 29·2	8	2·8	5·3	831	50	·061	− 375·1	145·6			
„ 12	3 28	XXXIV (Bandalduru)	E 0 9 7·0	8	2·9	5·3								
1864 Dec. 30,31	3 31	XXXII (Pallakŏnda)	E 0 33 35·5	12	2·7	5·3	840	58	·069	+ 979·1	2154·2			
1865 Jan. 4	3 36	XXXV (Pálchĕrla)	D 0 45 52·9	8	2·7	5·3						2153·0	2149	3·0
„ 9,10	2 56	XXXIII (Vutukúr)	E 0 57 34·4	8	2·7	5·3	865	60	·069	+1631·1	2151·8			
„ 4	2 57	XXXV (Pálchĕrla)	D 1 10 13·1	8	2·7	5·3								
„ 9	2 16	XXXIII (Vutukúr)	D 0 15 16·8	8	2·7	5·3	842	52	·061	− 222·7	293·9			
Feb. 2,3	2 24	XXXVI (Kayyúr)	E 0 2 45·9	12	3·0	5·3								
Jan. 4	3 13	XXXV (Pálchĕrla)	D 1 18 18·4	8	2·7	5·3	876	61	·070	−1855·0	293·5	293·5	293	2·7
Feb. 3	3 10	XXXVI (Kayyúr)	E 1 5 31·9	8	2·6	5·3								
Jan. 28,29	2 33	XXXVII (Gurramkŏnda)	D 0 6 42·4	8	2·7	5·3	617	34	·056	− 36·2	293·0			
Feb. 2	2 31	XXXVI (Kayyúr)	D 0 2 44·1	8	2·6	5·3								
Jan. 9	3 48	XXXIII (Vutukúr)	D 0 13 39·9	8	2·7	5·3	935	59	·063	− 185·8	330·8			
„ 28,29	3 47	XXXVII (Gurramkŏnda)	D 0 0 7·4	12	2·9	5·3						330·2	329·16	7·5
„ 13	3 33	XXXIV (Bandalduru)	D 0 2 27·7	8	2·7	5·3	1107	63	·057	+ 188·0	329·5			
„ 28	3 34	XXXVII (Gurramkŏnda)	D 0 14 1·7	8	2·9	5·3								
„ 13	3 47	XXXIV (Bandalduru)	D 0 3 6·5	8	2·6	5·3	1062	63	·059	+ 149·3	290·8			
„ 17	3 47	XXXVIII (Gudali)	D 0 12 40·8	8	2·9	5·3						291·3	291	6·0
„ 28	2 49	XXXVII (Gurramkŏnda)	D 0 6 49·5	8	2·7	5·3	645	39	·061	− 37·4	291·8			
„ 17	2 50	XXXVIII (Gudali)	D 0 2 53·7	8	2·7	5·3								
„ 28	3 7	XXXVII (Gurramkŏnda)	D 0 14 34·6	8	2·7	5·3	921	38	·041	− 201·3	127·9			
Feb. 16,17	3 6	XXXIX (Ánĕpúdi)	E 0 0 17·2	16	2·7	5·3								

Astronomical Date 1865		Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
		h m		° ′ ″				″							feet
Jan.	17	3 15	XXXVIII (Gudali)	D 0 13 24·2	8	2·6	5·3	771	32	·042	− 167·3	124·0	127·3	128	14·0
Feb.	16	3 16	XXXIX (Ánĕpúdi)	E 0 1 24·0	8	2·7	5·3								
,,	5,6	3 32	XL (Pillimedu)	D 0 20 2·0	12	2·7	5·3	989	44	·044	− 362·7	129·9			
,,	16,17	3 31	XXXIX (Ánĕpúdi)	E 0 4 50·1	16	2·6	5·3								
,,	3	2 53	XXXVI (Kayyúr)	E 0 6 53·2	8	2·6	5·3	593	30	·050	+ 199·7	492·9			
,,	5,6	2 52	XL (Pillimedu)	D 0 16 4·6	12	2·7	5·3								
Jan.	28	2 13	XXXVII (Gurramkŏnda)	E 0 2 38·8	8	2·6	5·3	702	44	·063	+ 163·1	492·3	491·3	492	1·5
Feb.	6,7	2 13	XL (Pillimedu)	D 0 13 8·8	12	2·6	5·3								
,,	16,17	3 31	XXXIX (Ánĕpúdi)	E 0 4 50·1	16	2·6	5·3	989	44	·044	+ 362·7	488·7			
,,	5,6	3 32	XL (Pillimedu)	D 0 20 2·0	12	2·7	5·3								
,,	16,17	3 48	XXXIX (Ánĕpúdi)	E 1 19 7·1	12	2·9	5·3	954	65	·068	+2413·4	2540·7			
Mar.	11,15	3 46	XLI (Kambákamdurgam)	D 1 33 2·0	16	2·7	5·3								
Feb.	6,7	3 16	XL (Pillimedu)	E 0 53 0·2	12	2·9	5·3	1136	72	·063	+2047·8	2539·1	2539·0	2540	1·5
Mar.	11,13	3 16	XLI (Kambákamdurgam)	D 1 9 42·0	8	2·6	5·3								
May	6	3 30	XLIV (Rĕttambedu)	E 1 2 18·0	12	2·6	5·3	1187	81	·068	+2482·4	2537·2			
Mar.	11	3 29	XLI (Kambákamdurgam)	D 1 19 37·1	8	0·2	5·3								
Feb.	5	3 9	XL (Pillimedu)	E 1 16 13·4	8	2·6	5·3	723	50	·069	+1736·1	2227·4			
,,	10	3 8	XLIII (Yerpet)	D 1 26 51·7	8	2·6	5·3						2226·9	2229	1·5
Mar.	11,13	2 52	XLI (Kambákamdurgam)	D 0 17 41·1	12	2·7	5·3	1154	72	·063	− 312·7	2226·3			
Feb.	10	2 53	XLIII (Yerpet)	E 0 0 42·1	8	2·9	5·3								
Mar.	11,12	2 21	XLI (Kambákamdurgam)	D 0 0 39·6	12	2·7	5·3	1168	70	·060	+ 274·5	2813·5			
,,	26,27	2 43	XXXIII (Nagari)	D 0 16 37·6	12	2·6	5·3						2813·2	2814	1·5
Feb.	10	3 26	XLIII (Yerpet)	E 0 7 29·4	8	2·7	5·3	1216	77	·063	+ 585·9	2812·8			
Mar.	26,27	3 25	XXXIII (Nagari)	D 0 25 21·3	12	2·7	5·3								
,,	14	3 5	XLI (Kambákamdurgam)	D 1 14 27·6	8	*48·1	5·3	1214	75	·062	−2284·7	254·3			
May	13,17	2 45	XXXV (Chĕmbedu)	E 0 55 34·5	12	2·6	*10·0								
,,	6	4 23	XLIV (Rĕttambedu)	D 0 1 21·7	8	*13·0	5·3	928	−11	·012	+ 197·3	252·1	253·2	257	70·3
,,	11	4 23	XXXV (Chĕmbedu)	D 0 14 21·6	16	11·4	*10·0								
Mar.	26	3 8	XXXIII (Nagari)	D 1 13 5·7	8	*43·8	5·3	1412	89	·063	−2566·8	† 246·4			
May	11,13	3 15	XXXV (Chĕmbedu)	E 0 51 43·1	8	4·6	*10·0								
Mar.	11	3 29	XLI (Kambákamdurgam)	D 1 19 37·1	8	0·2	5·3	1187	81	·068	−2482·4	56·6	56·6	54·77	28·4
May	6	3 30	XLIV (Rĕttambedu)	E 1 2 18·0	12	2·6	5·3								
Feb.	16,17	3 40	XXXIX (Ánĕpúdi)	D 0 11 22·3	12	4·7	5·3	907	11	‡ ·012	− 106·0	† 22·3			
			XLII (Jonangipálĕm)												
Mar.	11,13,15	3 11	XLI (Kambákamdurgam)	D 1 20 28·2	12	13·8	5·3	1177	88	·075	−2512·7	27·7	26·4	26	14·0
,,	6	3 11	XLII (Jonangipálĕm)	E 1 3 57·5	8	2·8	5·3								

NOTE.—Stations XXXIII (Nagari) and XXXV (Chĕmbedu) appertain to the Madras Longitudinal Series.
* These heights are to be combined with negative signs because the tower at XXXV (Chĕmbedu) had a subsequent permanent addition made to it of 15·4 feet. † Rejected. ‡ Assumed.

Astronomical Date 1865	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
May 6	3 51	XLIV (Rĕttambedu)	D 0 7 54·9	8	11·5	5·3	755	−33	·044	− 29·8	25·0			
Mar. 6	3 54	XLII (Jonangipálĕm)	D 0 5 27·2	8	6·4	5·3								
1860 Dec.18,21,24,25	2 27	XLI (Sánjib)	D 0 42 56·1	16	2·8	5·3	995	66	·066	−1044·1	1097·9	1097·9	1098·52	1·0
1861 Jan. 21,22	2 25	XLVI (Kappakŏnda)	E 0 28 22·4	8	2·8	5·3								
„ 2,3	2 22	XXXIX (Dhár)	D 0 59 46·2	8	2·8	5·3	913	58	·063	−1423·8	2669·2			
„ 15,16,17	2 22	XLV (Gundálamma)	E 0 46 17·4	12	2·8	5·3								
1860 Dec. 18,21,22,24,25	2 43	XLI (Sánjib)	E 0 4 59·0	20	2·8	5·3	1259	82	·065	+ 527·0	2669·0	2668·6	2668	2·0
1861 Jan. 12,14,15,16,17	2 45	XLV (Gundálamma)	D 0 23 22·5	20	3·0	5·3								
„ 21,22	3 28	XLVI (Kappakŏnda)	E 0 55 36·4	8	2·8	5·3	861	53	·062	+1569·0	2667·5			
„ 12,14,15,17	3 31	XLV (Gundálamma)	D 1 8 22·2	16	2·8	5·3								
„ 2,3	2 46	XXXIX (Dhár)	D 0 20 33·5	8	2·9	5·3	777	40	·052	− 335·8	3757·2			
„ 8	2 43	XLVII (Pagulráyi)	E 0 8 43·9	4	2·8	5·3								
„ 12,16	2 38	XLV (Gundálamma)	E 0 32 19·9	8	2·9	5·3	945	59	·062	+1090·2	3758·8	3758·0	3757	2·0
„ 7,8	2 33	XLVII (Pagulráyi)	D 0 46 17·2	8	2·8	5·3								
„ 14,15,17	3 19	XLV (Gundálamma)	D 0 50 11·3	12	2·9	5·3	776	45	·059	−1013·4	1655·2			
„ 28,29	3 20	XLVIII (Nágal)	E 0 38 32·9	8	2·8	5·3								
„ 21,22	2 42	XLVI (Kappakŏnda)	E 0 10 41·4	8	2·9	5·3	1024	60	·058	+ 553·5	1652·0	1654·0	1653	2·0
„ 28,29	2 40	XLVIII (Nágal)	D 0 25 55·7	8	2·9	5·3								
Feb. 2,3,14	2 13	XLIX (Kalimámidi)	D 0 54 21·4	12	2·8	5·3	823	50	·061	−1164·6	1654·9			
Jan. 28,29	2 15	XLVIII (Nágal)	E 0 42 6·4	8	2·8	5·3								
„ 12,14,15,17	3 6	XLV (Gundálamma)	E 0 1 23·3	16	2·8	5·3	739	44	·059	+ 151·3	2819·9			
Feb. 2,3	3 4	XLIX (Kalimámidi)	D 0 12 28·4	8	2·8	5·3								
Jan. 7,8	3 13	XLVII (Pagulráyi)	D 0 43 29·8	8	2·8	5·3	860	54	·063	− 938·9	2819·1	2819·1	2818	1·5
Feb. 2,3	3 11	XLIX (Kalimámidi)	E 0 30 46·6	8	2·9	5·3								
Jan. 28,29	2 15	XLVIII (Nágal)	E 0 42 6·4	8	2·8	5·3	823	50	·061	+1164·6	2818·2			
Feb. 2,3,14	2 13	XLIX (Kalimámidi)	D 0 54 21·4	12	2·8	5·3								
Jan. 28,29	2 54	XLVIII (Nágal)	D 0 22 26·8	8	2·8	5·3	805	47	·059	− 390·3	1263·7			
Feb. 18,21	2 54	L (Nallakŏnda)	E 0 10 24·0	8	2·8	5·3								
„ 2,3,14	2 42	XLIX (Kalimámidi)	D 0 54 57·0	12	2·8	5·3	1136	70	·061	−1554·5	1264·6	1264·2	1263	2·0
„ 19,23	2 48	L (Nallakŏnda)	E 0 38 11·8	8	2·8	5·3								
Jan. 28,29	2 28	XLVIII (Nágal)	D 0 47 14·3	8	2·8	5·3	1157	66	·057	−1311·5	342·5			
Mar. 5,7	2 28	LI (Elangoi)	E 0 30 0·5	8	2·9	5·3								
Feb.18,19,21	2 17	L (Nallakŏnda)	D 0 39 34·7	12	2·9	5·3	974	52	·053	− 922·3	341·9	342·2	340	4·0
Mar. 5,6	2 16	LI (Elangoi)	E 0 24 54·5	8	2·8	5·3								
Feb. 14	2 29	XLIX (Kalimámidi)	D 0 7 11·1	4	4·3	5·3	930	59	·064	− 10·6	2808·5	2809·1	2807	0·0
„ 9,10	2 28	LII (Kappa)	D 0 6 28·1	8	2·8	5·3								

NOTE.—Stations XXXIX (Dhár) and XLI (Sánjib) appertain to the Bider Longitudinal Series of the South-East Quadrilateral.

Astronomical Date 1861	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Feb. 19,21,22	2 47	L (Nallakŏnda)	E 1 0 25·5	12	4·2	5·3	794	49	·062	+1545·6	2809·8			
„ 9,10	2 45	LII (Kappa)	D 1 12 10·0	8	2·8	5·3								
„ 19,22,23	3 11	L (Nallakŏnda)	D 0 38 38·0	12	2·9	5·3	946	54	·057	− 876·5	387·7			
Mar. 9,10,11,14	3 14	LIII (Náwilmĕtta)	E 0 24 29·9	16	2·8	5·3								
„ 5,6,7	2 41	LI (Elangoi)	D 0 3 3·5	12	2·9	5·3	677	20	·030	+ 47·3	389·5	388·2	386	4·0
„ 10,11,13	2 42	LIII (Náwilmĕtta)	D 0 7 47·8	12	2·9	5·3								
Feb.28,Mar.1	2 22	LIV (Pothkŏnda)	D 0 50 42·8	8	2·8	5·3	869	52	·060	−1129·2	387·4			
Mar.10,11,14	2 23	LIII (Náwilmĕtta)	E 0 37 46·2	12	2·8	5·3								
Feb.18,21,22	2 1	L (Nallakŏnda)	E 0 6 4·1	12	2·8	5·3	738	47	·063	+ 251·9	1516·1			
Mar. 1	1 59	LIV (Pothkŏnda)	D 0 17 2·7	4	2·8	5·3								
Feb. 9,10	3 1	LII (Kappa)	D 0 53 8·2	8	2·9	5·3	956	56	·059	−1292·0	1517·1	1517·0	1515	2·5
„ 28,Mar.1	2 59	LIV (Pothkŏnda)	E 0 38 57·2	8	4·3	5·3								
Mar.10,11,14	2 23	LIII (Náwilmĕtta)	E 0 37 46·2	12	2·8	5·3	869	52	·060	+1129·2	1517·8			
Feb.28,Mar.1	2 22	LIV (Pothkŏnda)	D 0 50 42·8	8	2·8	5·3								
Mar. 9,10,12,14	2 46	LIII (Náwilmĕtta)	D 0 9 40·3	16	2·8	5·3	1016	40	·040	− 53·8	334·4			
May6,7,10,11	2 49	LV (Lachmipuram)	D 0 6 5·1	14	2·9	5·3								
Feb. 28	3 14	LIV (Pothkŏnda)	D 0 45 15·3	4	2·9	5·3	1089	61	·056	−1187·9	329·1	330·8	328	4·5
May 6,7,11	3 15	LV (Lachmipuram)	E 0 28 59·8	12	2·8	5·3								
June 2,3	2 11	LVI (Adakŏnda)	D 0 46 55·0	8	2·8	5·3	877	51	·058	−1039·2	329·0			
May 7,9,10	2 18	LV (Lachmipuram)	E 0 33 47·7	10	2·8	5·3								
Mar. 9,11,13	3 10	LIII (Nawilmĕtta)	E 0 11 57·4	12	2·8	5·3	1463	89	·061	+ 980·1	1368·3			
June 1,2	3 3	LVI (Adakŏnda)	D 0 33 29·0	8	2·8	5·3								
Feb. 27	2 43	LIV (Pothkŏnda)	D 0 12 20·2	4	2·8	5·3	888	51	·057	− 149·0	1368·0	1369·1	1367	2·5
June 2,3	2 41	LVI (Adakŏnda)	D 0 0 58·0	8	2·9	5·3								
May 7,9,10	2 18	LV (Lachmipuram)	E 0 33 47·7	10	2·8	5·3	877	51	·058	+1039·2	1371·0			
June 2,3	2 11	LVI (Adakŏnda)	D 0 46 55·0	8	2·8	5·3								
May 6,9,10	3 5	LV (Lachmipuram)	E 0 3 20·6	12	2·9	5·3	829	33	·040	+ 239·8	570·6			
„ 21	3 1	LVII (Yĕdlagattu)	D 0 16 15·8	4	2·8	5·3						569·8	567	3·0
June 2,3	2 8	LVI (Adakŏnda)	D 0 36 42·0	8	2·9	5·3	910	53	·058	− 800·2	568·9			
May 22,23	2 13	LVII (Yĕdlagattu)	E 0 23 7·2	8	2·8	5·3								
„ 6,9,11	2 36	LV (Lachmipuram)	D 0 12 27·2	14	2·9	5·3	768	5	·007	− 136·5	194·3			
„ 14,15	2 39	LVIII (Aupád)	D 0 0 15·7	8	2·8	5·3						194·6	191·45	7·0
„ 21,22	2 56	LVII (Yĕdlagattu)	D 0 28 50·4	8	2·8	5·3	524	2	·003	− 374·8	195·0			
„ 14,15,16	2 56	LVIII (Aupád)	E 0 19 50·7	12	2·9	5·3								
„ 21,22	3 13	LVII (Yĕdlagattu)	D 0 6 57·9	8	2·8	5·3	514	26	·051	− 44·8	522·2			
„ 18,19	3 18	LIX (Sudkŏnda)	D 0 1 2·5	8	2·9	5·3								

Astronomical Date 1861-62	Astronomical Date: Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
May 15,16	2 25	LVIII (Aupád)	E 0 10 20·3	8	5·8	5·3	694	7	·010	+ 327·3	518·8	521·2	521	1·5
„ 18	2 35	LIX (Sudkŏnda)	D 0 21 38·0	4	5·6	5·3								
„ 25,26,28	2 36	LX (Parampúdi)	D 0 13 2·2	12	2·8	5·3	920	46	·050	− 163·0	522·5			
„ 19	2 36	LIX (Sudkŏnda)	D 0 0 57·6	6	2·9	5·3								
June 2	2 32	LVI (Adakŏnda)	D 0 30 58·5	4	2·9	5·3	975	56	·057	− 682·1	684·6			
May 28	2 24	LX (Parampúdi)	E 0 16 25·2	4	2·8	5·3								
„ 21	2 25	LVII (Yĕdlagattu)	D 0 1 26·7	4	2·9	5·3	829	40	·048	+ 119·4	686·4	684·8	685	2·5
„ 25,26,28	2 23	LX (Parampúdi)	D 0 11 14·5	12	2·9	5·3								
„ 19	2 36	LIX (Sudkŏnda)	D 0 0 57·6	6	2·9	5·3	920	46	·050	+ 163·0	683·5			
„ 25,26,28	2 36	LX (Parampúdi)	D 0 13 2·2	12	2·8	5·3								
Dec. 4,6	1 57	LIX (Sudkŏnda)	E 0 28 1·2	8	2·8	5·5	620	34	·055	+ 598·1	1119·3			
„ 9,10	1 57	LXI (Bandanchĕrla)	D 0 37 29·5	8	2·8	5·3						1118·3	1118	2·0
„ 19,20,21,22	1 33	LX (Parampúdi)	E 0 15 7·2	16	5·6	5·3	725	53	·073	+ 432·4	1117·2			
„ 8,9,10	1 34	LXI (Bandanchĕrla)	D 0 25 32·4	12	2·9	5·3								
„ 19,20,21,22	2 20	LX (Parampúdi)	E 0 15 28·4	16	2·8	5·3	1040	69	·066	+ 707·4	1392·2			
„ 15,16	2 21	LXII (Nágaldurgam)	D 0 30 40·3	8	2·9	5·3						1391·9	1392	2·0
„ 9,10	1 55	LXI (Bandanchĕrla)	E 0 0 45·9	8	2·8	5·3	1076	70	·065	+ 273·3	1391·6			
„ 16	1 57	LXII (Nágaldurgam)	D 0 16 26·5	4	5·6	5·3								
„ 4,6	2 1	LIX (Sudkŏnda)	D 0 9 26·4	8	2·8	5·5	1126	67	·060	− 36·5	484·7			
Jan. 1,2	2 6	LXIII (Dudugat)	D 0 7 14·2	8	2·8	5·3						484·0	484	1·5
Dec. 8,9,10	2 47	LXI (Bandanchĕrla)	D 0 27 29·1	12	2·8	5·3	1127	71	·063	− 635·0	483·3			
Jan. 1,2	2 45	LXIII (Dudugat)	E 0 10 59·0	8	5·6	5·3								
Dec. 8,9,10	2 35	LXI (Bandanchĕrla)	D 0 20 21·7	12	2·8	5·3	1033	63	·061	− 387·7	730·6			
„ 28,29	2 36	LXIV (Inuprâyi)	E 0 5 10·3	8	5·6	5·4						731·4	731	2·0
„ 15,16	2 4	LXII (Nágaldurgam)	D 0 31 20·5	8	2·8	5·3	910	60	·066	− 659·6	732·3			
„ 28,29	2 4	LXIV (Inuprâyi)	E 0 17 58·7	8	2·8	5·4								
„ 8,9,10	2 24	LXI (Bandanchĕrla)	E 0 1 13·8	12	2·8	5·3	1074	66	·062	+ 289·9	1408·2			
Jan. 8,10,11	2 23	LXV (Dálgattu)	D 0 17 0·0	12	5·6	5·4								
„ 1,2	2 5	LXIII (Dudugat)	E 0 43 0·6	8	2·8	5·3	656	41	·063	+ 925·0	1409·0	1408·7	1408	1·8
„ 7,8,10,11	2 5	LXV (Dálgattu)	D 0 52 50·0	16	2·8	5·4								
Dec. 28,29	2 35	LXIV (Inuprâyi)	E 0 21 6·8	8	2·8	5·4	845	54	·065	+ 677·6	1409·0			
Jan. 7,10,11	2 35	LXV (Dálgattu)	D 0 33 34·5	12	2·9	5·4								
„ 1,2	2 22	LXIII (Dudugat)	E 0 18 36·2	8	2·8	5·3	1018	62	·061	+ 785·2	1269·2			
„ 17,18	2 22	LXVI (Yĕrragattu)	D 0 33 41·0	8	2·8	5·4								
„ 7,10,11	2 48	LXV (Dálgattu)	D 0 12 1·6	12	2·9	5·4	924	58	·063	− 141·1	1267·6	1268·4	1268	1·5
„ 17,18	2 44	LXVI (Yĕrragattu)	D 0 1 37·8	8	2·8	5·4								

Astronomical Date 1861-62	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Jan. 22,23	2 20	LXVII (Jammalavoidurgam)	D 0 26 46·0	8	2·8	5·4	1041	66	·064	− 583·9	1268·4			
„ 16,17,18	2 20	LXVI (Yĕrragattu)	E 0 11 28·3	12	2·8	5·4								
Dec. 28,29	2 13	LXIV (Inupráyi)	E 0 37 47·0	8	2·9	5·4	862	52	·061	+1120·9	1852·3			
Jan. 22,23	2 12	LXVII (Jammalavoidurgam)	D 0 50 35·9	8	2·8	5·4								
„ 7,8,10,11	1 43	LXV (Dálgattu)	E 0 14 16·4	16	2·9	5·4	755	46	·061	+ 443·5	1852·2	1852·3	1852	1·6
„ 22,23	1 43	LXVII (Jammalavoidurgam)	D 0 25 33·2	8	2·9	5·4								
„ 16,17,18	2 20	LXVI (Yĕrragattu)	E 0 11 28·3	12	2·8	5·4	1041	66	·064	+ 583·9	1852·3			
„ 22,23	2 20	LXVII (Jammalavoidurgam)	D 0 26 46·0	8	2·8	5·4								
„ 16,17,18	1 34	LXVI (Yĕrragattu)	E 0 20 28·3	12	2·8	5·4	685	41	·060	+ 518·0	1786·4			
Feb. 1,2	1 34	LXVIII (Jujúrdurgam)	D 0 30 46·2	8	2·8	5·4						1786·6	1786	1·2
Jan. 22,23	1 42	LXVII (Jammalavoidurgam)	D 0 9 35·9	8	2·8	5·4	996	62	·062	− 65·5	1786·8			
Feb. 1,2	1 44	LXVIII (Jujúrdurgam)	D 0 5 7·3	8	2·9	5·4								
Jan. 16,17	2 13	LXVI (Yĕrragattu)	D 0 37 31·3	10	2·8	5·4	587	34	·057	− 569·4	699·0			
Feb. 6,7	2 14	LXIX (Bĕzváda)	E 0 28 33·8	8	2·8	5·3						699·0	698	0·5
„ 1,2	2 27	LXVIII (Jujúrdurgam)	D 0 50 58·2	8	2·9	5·4	826	49	·059	−1087·6	699·0			
„ 6,7	2 27	LXIX (Bĕzváda)	E 0 38 38·3	8	2·8	5·3								
Jan. 22,23	2 25	LXVII (Jammalavoidurgam)	D 0 50 23·4	8	2·9	5·4	1022	67	·066	−1293·2	559·1			
„ 27,28	2 25	LXX (Jŏnnalagadda)	E 0 35 26·3	8	2·8	5·4						559·4	559	1·5
Feb. 1,2	2 5	LXVIII (Jujúrdurgam)	D 1 0 6·0	8	2·8	5·4	765	53	·069	−1226·9	559·7			
Jan. 27,28	2 5	LXX (Jŏnnalagadda)	E 0 48 52·8	8	2·8	5·4								
Feb. 1,2	1 55	LXVIII (Jujúrdurgam)	D 0 50 41·8	8	2·8	5·4	704	45	·064	− 939·3	847·3			
„ 16,17	1 56	LXXI (Anantavaram)	E 0 40 13·5	8	2·8	5·3								
„ 6,7	1 37	LXIX (Bĕzváda)	E 0 3 8·2	8	2·9	5·3	634	42	·066	+ 147·1	846·1	847·4	847	1·5
„ 17	1 28	LXXI (Anantavaram)	D 0 12 35·0	8	2·8	5·3								
„ 10,11	2 3	LXXII (Chintalapád)	E 0 21 33·1	8	2·8	5·4	809	46	·056	+ 657·9	848·8			
„ 15,16,17	2 2	LXXI (Anantavaram)	D 0 33 43·0	12	2·9	5·3								
„ 1,2	2 14	LXVIII (Jujúrdurgam)	D 1 15 44·5	8	2·9	5·4	772	51	·066	−1596·9	189·7			
„ 10,11,12	2 13	LXXII (Chintalapád)	E 1 4 20·9	12	2·8	5·4								
Jan. 27,28	1 46	LXX (Jŏnnalagadda)	D 0 22 36·0	8	2·9	5·4	741	34	·046	− 367·4	192·0	190·2	190	2·3
Feb. 10,11,12	1 46	LXXII (Chintalapád)	E 0 11 9·8	12	2·9	5·4								
„ 15,16,17	2 2	LXXI (Anantavaram)	D 0 33 43·0	12	2·9	5·3	809	46	·056	− 657·9	188·8			
„ 10,11	2 3	LXXII (Chintalapád)	E 0 21 33·1	8	2·8	5·4								
„ 15,16,17	2 19	LXXI (Anantavaram)	D 0 37 55·4	12	2·9	5·3	645	37	·057	− 629·0	218·4			
„ 25,26,27	2 19	LXXIII (Lagadapád)	E 0 28 8·3	12	2·8	5·3						221·0	220	4·0
„ 10,11,12	2 36	LXXII (Chintalapád)	D 0 3 34·7	12	2·8	5·4	634	3	·004	+ 33·3	223·5			
„ 24,25,26,27,28	2 39	LXXIII (Lagadapád)	D 0 7 9·7	20	2·9	5·3								

Astronomical Date 1862	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Feb. 15,16	2 14	LXXI (Anantavaram)	D 0 37 11·5	8	2·8	5·3	620	38	·061	− 591·4	256·0			
„ 22	2 13	LXXIV (Gorantla)	E 0 27 51·2	4	2·8	5·3						254·1	253	1·5
„ 24,25,26,28, Mar. 1	1 30	LXXIII (Lagadapád)	D 0 5 57·7	20	2·8	5·3	871	10	·012	+ 31·3	252·3			
„ 20,21,22	1 27	LXXIV (Gorantla)	D 0 8 24·2	16	2·9	5·3								
Apr. 16,17	1 30	LXXII (Chintalapád)	E 0 26 46·4	12	2·9	5·4	648	35	·054	+ 606·6	796·8			
„ 11	1 28	LXXV (Chikri)	D 0 36 40·9	4	2·9	5·4						796·7	796	1·0
„ 12,13,14	1 38	LXXIII (Lagadapád)	E 0 23 23·3	12	2·9	5·3	682	33	·049	+ 575·7	796·7			
„ 10,11	1 36	LXXV (Chikri)	D 0 33 53·7	8	2·8	5·4								
„ 12,13,14	2 31	LXXIII (Lagadapád)	D 0 4 4·1	20	2·8	5·3	551	−49	·090	+ 24·3	245·3			
„ 7,8	2 26	VII (Dhúlipalla)	D 0 7 3·9	8	2·8	5·4								
„ 10,11	2 19	LXXV (Chikri)	D 0 36 45·5	8	2·8	5·4	583	29	·050	− 551·7	245·0	244·9	244	5·0
„ 7,8	2 25	VII (Dhúlipalla)	E 0 27 42·7	8	2·9	5·4								
„ 3,4	1 29	X (Ádamsáb)	D 0 58 49·8	8	2·9	5·3	938	55	·058	−1431·5	244·3			
„ 8	1 28	VII (Dhúlipalla)	E 0 44 50·0	4	2·8	5·4								
Feb. 24,25,26, Mar. 1	2 25	LXXIII (Lagadapád)	E 0 51 14·4	16	2·8	5·3	861	51	·059	+1457·3	1678·3			
Apr. 3,4	2 22	X (Ádamsáb)	D 1 4 5·7	8	2·8	5·3								
Feb. 20,21,22	1 40	LXXIV (Gorantla)	E 1 12 39·8	12	2·8	5·3	623	40	·065	+1419·2	1673·3	1676·1	1675	1·0
Apr. 3,4	1 41	X (Ádamsáb)	D 1 21 58·4	8	2·9	5·3								
„ 8	1 28	VII (Dhúlipalla)	E 0 44 50·0	4	2·8	5·4	938	55	·058	+1431·5	1676·6			
„ 3,4	1 29	X (Ádamsáb)	D 0 58 49·8	8	2·9	5·3								

Description of Spirit-levelled Points.

When determining the Spirit-levelled heights, given on pages 117—E. to 123—E., the levelling staff stood on the surfaces hereafter described.

XII (Pálapáru) XVIII (Ongole) XXXIV (Bandalduru)	On the upper mark-stone.
XXXVII (Gurramkŏnda)	On a stone at the foot of the station platform, height = 321·15 feet. To this value, 8·01 feet (the height of the upper mark-stone above this stone) being added, the height of the upper mark-stone was found to be 329·16 feet.
XLIV (Rĕttambedu)	On a peg at the foot of the station tower, height = 27·85 feet. To this value, 26·92 feet (the height of the upper mark-stone above this peg) being added, the height of the upper mark-stone was found to be 54·77 feet.
XLVI (Kappakŏnda)	On a stone at the foot of the station platform, height = 1094·21 feet. To this value, 4·31 feet (the height of the upper mark-stone above this stone) being added, the height of the upper mark-stone was found to be 1098·52 feet.
LVIII (Aupád)	On a peg at the foot of the station platform, height = 185·54 feet. To this value, 5·91 feet (the height of the upper mark-stone above this peg) being added, the height of the upper mark-stone was found to be 191·45 feet.

For further particulars of these stations, see pages 7—E. to 14—E.

November, 1889.

W. H. COLE,
In charge of Computing Office.

MADRAS MERIDIONAL AND COAST SERIES.

PRINCIPAL TRIANGULATION. AZIMUTHAL OBSERVATIONS.

At VII (Dhúlipalla)

Lat. N. 16° 25′ 56″·75; Long. E. 80° 7′ 56″·77 = 5ʰ 20ᵐ 31ˢ·8; Height above Mean Sea Level, 244 feet.
April and May 1868; observed by Mr. G. Shelverton with Troughton and Simms' 36-inch Theodolite.

Stars observed	ε Ursæ Minoris (East) and	B. A. C. 2326 Camelopardi (West).
Mean Right Ascension 1868·0	16^h 59^m 36^s	7^h 3^m 7^s
Mean North Polar Distance 1868·0	7° 45′ 0″·58	7° 20′ 39″·48
Local Mean Times of Elongation, April 27	Eastern 8^h 45^m	Western 10^h 30^m

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Apr. 27	E.	0 2	+ 10 47 21·72	28 42	− 3 44·22	+ 10 43 37·50	+ 10 44 38·50	14 43	− 0 59·17	+ 10 43 39·33
		&	46 25·40	24 49	2 47·82	37·58	44 17·62	11 47	0 37·97	39·65
		180 1	43 39·78	2 46	0 2·10	37·68	43 58·34	8 18	0 18·86	39·48
			43 39·88	0 43	0 0·14	39·74	44 13·16	11 4	0 33·56	39·60
„ 27	W.	0 2	+ 26 25 41·88	23 12	+ 2 20·21	+ 26 28 2·09	+ 26 27 31·48	11 11	+ 0 32·55	+ 26 28 4·03
		&	26 12·28	20 30	1 49·45	1·73	27 47·96	7 42	0 15·43	3·39
		180 2	28 3·24	1 4	0 0·29	3·53	27 27·96	11 37	0 34·94	2·90
			27 59·42	3 56	0 4·01	3·43	27 8·90	14 24	0 53·66	2·56
„ 28	E.	79 12	+ 10 45 5·16	17 37	− 1 24·69	+ 10 43 40·47	+ 10 43 49·48	6 8	− 0 10·29	+ 10 43 39·19
		&	44 37·08	14 21	0 56·24	40·84	43 43·16	3 28	0 3·29	39·87
		259 11	43 44·60	4 27	0 5·42	39·18	44 41·48	15 3	1 2·14	39·34
			43 56·54	7 17	0 14·53	42·01	45 12·88	18 27	1 33·44	39·44
„ 28	W.	79 12	+ 26 27 25·26	12 3	+ 0 37·74	+ 26 28 3·00	+ 26 28 1·98	0 38	+ 0 0·10	+ 26 28 2·08
		&	27 43·64	8 50	0 20·27	3·91	28 1·14	2 59	0 2·32	3·46
		259 11	27 37·06	10 25	0 28·14	5·20	26 20·42	19 58	1 43·14	3·56
			27 22·50	12 50	0 42·69	5·19	25 55·54	22 15	2 8·01	3·55
„ 29	E.	158 24	+ 10 44 22·30	12 36	− 0 43·38	+ 10 43 38·92	+ 10 43 38·42	1 52	− 0 0·96	+ 10 43 37·46
		&	44 5·84	9 41	0 25·64	40·20	43 39·16	0 36	0 0·10	39·06
		338 23	44 2·68	9 7	0 22·77	39·91	45 24·38	19 45	1 47·07	37·31
			44 17·24	11 43	0 37·64	39·60	46 4·58	23 8	2 26·96	37·62

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Apr. 29	W.	158 24	+ 26 25 7·38	25 56	+ 2 55·10	+ 26 28 2·48	+ 26 27 15·66	13 38	+ 0 48·30	+ 26 28 3·96
		&	25 42·58	23 7	2 19·08	1·66	27 35·12	10 48	0 30·30	5·42
		338 24	28 1·42	2 27	0 1·55	2·97	27 41·70	9 24	0 22·93	4·63
			28 3·32	0 24	0 0·04	3·36	27 24·92	12 39	0 41·49	6·41
„ 30	E.	237 36	+ 10 44 22·58	12 38	− 0 43·57	+ 10 43 39·01	+ 10 43 41·14	2 21	− 0 1·52	+ 10 43 39·62
		&	43 59·92	8 31	0 19·81	40·11	43 45·86	4 27	0 5·43	40·43
		57 36	44 16·98	11 34	0 36·72	40·26	46 11·50	23 35	2 32·82	38·68
			44 31·58	13 53	0 52·91	38·67	46 38·30	25 32	2 59·18	39·12
„ 30	W.	237 37	+ 26 25 18·54	25 12	+ 2 45·41	+ 26 28 3·95	+ 26 27 4·24	15 7	+ 0 59·46	+ 26 28 3·70
		&	25 50·66	22 18	2 9·49	0·15	27 22·94	12 27	0 40·32	3·26
		57 36	27 55·12	5 2	0 6·58	1·70	27 53·38	5 52	0 8·93	2·31
			28 0·14	2 21	0 1·44	1·58	27 44·68	8 40	0 19·47	4·15
May 1	E.	316 49	+ 10 44 34·18	14 13	− 0 55·23	+ 10 43 38·95	+ 10 43 41·82	3 18	− 0 2·99	+ 10 43 38·83
		&	44 11·06	10 50	0 32·10	38·96	43 39·04	0 15	0 0·02	39·02
		136 49	43 57·30	7 57	0 17·30	40·00	45 37·50	20 51	1 59·31	38·19
			44 36·42	14 13	0 55·41	41·01	46 12·44	23 41	2 34·00	38·44
„ 1	W.	316 49	+ 26 24 14·00	29 35	+ 3 48·15	+ 26 28 2·15	+ 26 26 41·28	17 35	+ 1 20·53	+ 26 28 1·81
		&	25 0·36	26 22	3 1·19	1·55	27 3·54	14 59	0 58·46	2·00
		136 49	27 52·50	7 10	0 13·37	5·87	27 55·92	4 56	0 6·30	2·22
			27 59·94	3 41	0 3·54	3·48	27 47·46	7 16	0 13·67	1·13

Abstract of Astronomical Azimuth observed at VII (Dhúlipalla) 1868.

1. By Eastern Elongation of ε Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	0°	180°	79°	259°	158°	338°	238°	58°	317°	137°
Date	April 27		April 28		April 29		April 30		May 1	
	″	″	″	″	″	″	″	″	″	″
Observed difference	37·50	39·33	40·47	39·19	38·92	37·46	39·01	39·62	38·95	38·83
of Circle-Readings,	37·58	39·65	40·84	39·87	40·20	39·06	40·11	40·43	38·96	39·02
Ref. M. — Star	37·68	39·48	39·18	39·34	39·91	37·31	40·26	38·68	40·00	38·19
reduced to Elongation	39·74	39·60	42·01	39·44	39·60	37·62	38·67	39·12	41·01	38·44
Means	38·13	39·51	40·63	39·46	39·66	37·86	39·51	39·46	39·73	38·62
	° ′ ″		″		″		″		″	
Means of both faces	+ 10 43 38·82		40·05		38·76		39·48		39·18	
Level Corrections	− 0·04		+ 0·15		+ 0·33		− 0·08		+ 0·05	
Corrected Means	+ 10 43 38·78		40·20		39·09		39·40		39·23	
Az. of Star fr. S., by W.	188 5 1·44		1·17		0·90		0·63		0·34	
Az. of Ref. M. „	198 48 40·22		41·37		39·99		40·03		39·57	

Abstract of Astronomical Azimuth observed at VII (Dhúlipalla) 1868—(*Continued*).

2. By Western Elongation of B. A. C. 2326 Camelopardi.

Face	L	R	L	R	L	R	L	R	L	R
Zero	0°	180°	79°	259°	158°	338°	238°	58°	317°	137°
Date	April 27		April 28		April 29		April 30		May 1	
	"	"	"	"	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	2·09 1·73 3·53 3·43	4·03 3·39 2·90 2·56	3·00 3·91 5·20 5·19	2·08 3·46 3·56 3·55	2·48 1·66 2·97 3·36	3·96 5·42 4·63 6·41	3·95 0·15 1·70 1·58	3·70 3·26 2·31 4·15	2·15 1·55 5·87 3·48	1·81 2·00 2·22 1·13
Means	2·70	3·22	4·32	3·16	2·62	5·11	1·85	3·35	3·26	1·79

	° ′ "	"	"	"	"
Means of both faces	+ 26 28 2·96	3·74	3·86	2·60	2·53
Level Corrections	− 0·10	+ 0·02	+ 0·11	− 0·10	− 0·14
Corrected Means	+ 26 28 2·86	3·76	3·97	2·50	2·39
Az. of Star fr. S., by W.	172 20 36·44	36·30	36·16	36·01	35·86
Az. of Ref. M. „	198 48 39·30	40·06	40·13	38·51	38·25

		°	′	"
Astronomical Azimuth of Referring Mark ...	by Eastern Elongation	198	48	40·24
	by Western „		„	39·25
	Mean		„	39·75
Angle Referring Mark and V (Kachalboru) *see page* 23—E. *ante*		− 72	55	2·43
Astronomical Azimuth of Kachalboru by observation		125	53	37·32
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 110—E. *ante*		125	53	42·15
Astronomical—Geodetical Azimuth at VII (Dhúlipalla)		−		4·83

At XIV (Dánapa)

Lat. N. 15° 56′ 0″·14; Long. E. 79° 58′ 34″·57 = $5^h\ 19^m\ 54^s{\cdot}3$; Height above Mean Sea Level, 1010 feet.
December 1863; observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No. 1.

Star observed	δ Ursæ Minoris (East) and (West).
Mean Right Ascension 1863·0	$18^h\ 16^m\ 32^s$
Mean North Polar Distance 1863·0	3° 23′ 48″·55
Local Mean Times of Elongation, December 22	Eastern $18^h\ 15^m$; Western 6 10

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 22	E.	338 25	+ 25 29 17·68	29 9	− 1 42·21	+ 25 27 35·47	+ 25 31 3·66	41 19	− 3 24·88	+ 25 27 38·78
		&	28 57·78	26 6	1 21·98	35·80	30 31·82	38 30	2 58·00	33·82
		158 24	27 42·62	7 32	0 6·85	35·77	28 14·58	18 7	0 39·55	35·03
			27 37·26	4 41	0 2·65	34·61	28 2·46	15 27	0 28·77	33·69
„ 23	W.	57 37	+ 32 31 10·10	2 35	+ 0 0·81	+ 32 31 10·91	+ 32 30 22·54	20 14	+ 0 49·49	+ 32 31 12·03
		&	31 10·86	0 18	0 0·01	10·87	30 35·04	17 26	0 36·74	11·78
		237 37	29 8·74	31 49	2 1·66	10·40	30 49·80	14 27	0 25·15	14·95
			28 49·82	34 10	2 20·25	10·07	30 34·88	17 21	0 36·25	11·13
„ 23	E.	57 37	+ 25 28 14·66	18 10	− 0 39·75	+ 25 27 34·91	+ 25 29 25·10	30 16	− 1 50·14	+ 25 27 34·96
		&	28 3·02	15 11	0 27·78	35·24	29 5·80	27 18	1 29·65	36·15
		237 37	27 39·86	6 20	0 4·85	35·01	27 39·08	5 32	0 3·69	35·39
			27 45·10	9 51	0 11·73	33·37	27 37·08	2 48	0 0·95	36·13
„ 24	W.	136 49	+ 32 31 11·90	4 5	+ 0 2·02	+ 32 31 13·92	+ 32 30 46·18	15 2	+ 0 27·28	+ 32 31 13·46
		&	31 6·70	7 9	0 6·18	12·88	30 58·24	10 37	0 13·60	11·84
		316 48	27 25·00	43 42	3 49·15	14·15	30 6·32	23 31	1 6·62	12·94
			27 2·44	46 5	4 14·68	17·12	29 43·98	26 48	1 26·48	10·46
„ 24	E.	136 49	+ 25 27 57·36	13 7	− 0 20·75	+ 25 27 36·61	+ 25 28 49·42	24 54	− 1 14·65	+ 25 27 34·77
		&	27 46·84	9 52	0 11·75	35·09	28 30·52	21 54	0 57·77	32·75
		316 48	28 4·18	15 22	0 28·52	35·66	27 35·38	0 42	0 0·06	35·32
			28 11·04	16 33	0 33·08	37·96	27 45·40	8 51	0 9·46	35·94
„ 25	W.	180 1	+ 32 31 10·40	4 54	+ 0 2·91	+ 32 31 13·31	+ 32 30 23·42	20 12	+ 0 49·32	+ 32 31 12·74
		&	31 10·94	2 19	0 0·65	11·59	30 36·22	17 11	0 35·69	11·91
		0 0	28 31·94	36 38	2 41·19	13·13	30 31·16	18 14	0 40·05	11·21
			27 54·74	40 18	3 14·94	9·68	30 18·28	21 5	0 53·52	11·80

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 25	E.	180 1	+ 25 28 11·54	17 39	− 0 37·53	+ 25 27 34·01	+ 25 29 27·78	30 41	− 1 53·20	+ 25 27 34·58
		&	28 1·32	15 9	0 27·65	33·67	29 6·20	27 41	1 32·19	34·01
		0 0	27 35·44	3 24	0 1·40	34·04	27 39·86	7 17	0 6·39	33·47
			27 38·32	6 15	0 4·72	33·60	27 35·58	4 37	0 2·57	33·01
„ 26	W.	259 13	+ 32 31 16·60	0 44	+ 0 0·07	+ 32 31 16·67	+ 32 30 56·68	12 39	+ 0 19·33	+ 32 31 16·01
		&	31 13·26	3 34	0 1·54	14·80	31 3·18	9 38	0 11·21	14·39
		79 12	29 13·78	31 43	2 0·96	14·74	30 41·56	16 31	0 32·87	14·43
			28 50·40	34 32	2 23·33	13·73	30 31·04	18 57	0 43·26	14·30
„ 26	E.	259 13	+ 25 28 13·14	17 46	− 0 38·04	+ 25 27 35·10	+ 25 29 24·70	30 3	− 1 48·63	+ 25 27 36·07
		&	28 1·52	15 1	0 27·19	34·33	29 1·10	26 38	1 25·37	35·73
		79 12	27 38·46	5 48	0 4·06	34·40	27 40·92	6 4	0 4·44	36·48
			27 44·08	8 28	0 8·66	35·42	27 35·16	3 14	0 1·26	33·90
„ 27	W.	338 25	+ 32 31 12·34	5 8	+ 0 3·18	+ 32 31 15·52	+ 32 31 4·64	6 26	+ 0 5·00	+ 32 31 9·64
		&	31 6·86	7 1	0 5·94	12·80	31 10·34	3 55	0 1·85	12·19
		158 24	30 17·34	21 36	0 56·19	13·53	30 49·54	13 23	0 21·60	11·14
			30 6·58	23 31	1 6·60	13·18	30 42·90	14 54	0 26·76	9·66

Abstract of Astronomical Azimuth observed at XIV (Dánapa) 1863.

1. By Eastern Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	December 25		December 26		December 22		December 23		December 24	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	34·01	34·58	35·10	36·07	35·47	38·78	34·91	34·96	36·61	34·77
	33·67	34·01	34·33	35·73	35·80	33·82	35·24	36·15	35·09	32·75
	34·04	33·47	34·40	36·48	35·77	35·03	35·01	35·39	35·66	35·32
	33·60	33·01	35·42	33·90	34·61	33·69	33·37	36·13	37·96	35·94
Means	33·83	33·77	34·81	35·55	35·41	35·33	34·63	35·66	36·33	34·69
	° ′ ″		″		″		″		″	
Means of both faces	+ 25 27 33·80		35·18		35·37		35·15		35·51	
Az. of Star fr. S., by W.	183 31 49·78		50·09		48·74		49·11		49·46	
Az. of Ref. M. „	208 59 23·58		25·27		24·11		24·26		24·97	

Abstract of Astronomical Azimuth observed at XIV (Dánapa) 1863—(*Continued*).

2. By Western Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	December 25		December 26		December 27		December 23		December 24	
	"	"	"	"	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	13·31	12·74	16·67	16·01	15·52	9·64	10·91	12·03	13·92	13·46
	11·59	11·91	14·80	14·39	12·80	12·19	10·87	11·78	12·88	11·84
	13·13	11·21	14·74	14·43	13·53	11·14	10·40	14·95	14·15	12·94
	9·68	11·80	13·73	14·30	13·18	9·66	10·07	11·13	17·12	10·46
Means	11·93	11·92	14·98	14·78	13·76	10·66	10·56	12·47	14·52	12·18
	° ′ "		"		"		"		"	
Means of both faces	+ 32 31 11·93		14·88		12·21		11·51		13·35	
Az. of Star fr. S., by W.	176 28 10·39		10·08		9·76		11·10		10·71	
Az. of Ref. M. „	208 59 22·32		24·96		21·97		22·61		24·06	

		°	′	"
Astronomical Azimuth of Referring Mark ...	by Eastern Elongation	208	59	24·44
	by Western „		„	23·18
	Mean		„	23·81
Angle Referring Mark and XIII (Babbĕpalle) *see page* 28—E. *ante*		+ 56	48	11·93
Astronomical Azimuth of Babbĕpalle by observation		265	47	35·74
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 111—E. *ante*		265	47	41·78
Astronomical — Geodetical Azimuth at XIV (Dánapa)		—		6·04

At XXXI (Kistama)

Lat. N. 14° 27′ 14″·56; Long. E. 79° 47′ 45″·69 = 5h 19m 11s·0; Height above Mean Sea Level, 458 feet.
December 1864; observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No. 1.

Stars observed	δ Ursæ Minoris (West) and	Cephei 51 (Hev.) (East).
Mean Right Ascension 1864·0	18h 16m 13s	6h 35m 39s
Mean North Polar Distance 1864·0	3° 23′ 47″·10	2° 45′ 18″·86
Local Mean Times of Elongation, Dec. 21	Western 6h 11m	Eastern 6h 38m

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT				FACE RIGHT			
			Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	Interval in Time from Elongation	Reduction in Arc to Time of Elongation	Reduced Observation Ref. Mark – Star at Elongation	Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	Interval in Time from Elongation	Reduction in Arc to Time of Elongation	Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 21	W.	259 12	− 30 41 0·36	9 29	+ 0 10·77	− 30 40 49·59	− 30 41 50·48	22 39	+ 1 1·50	− 30 40 48·98
		&	40 53·72	0 38	0 0·05	53·67	41 34·72	19 52	0 47·32	47·40
		79 13	41 50·22	22 36	1 1·07	49·15	40 52·00	6 28	0 5·02	46·98
			42 45·42	30 44	1 52·82	52·60	41 11·86	14 5	0 23·75	48·11
„ 21	E.	259 12	− 36 60 16·70	32 57	− 1 45·51	− 37 1 62·21	− 36 61 27·00	18 25	− 0 33·03	− 37 1 60·03
		&	60 35·20	30 34	1 30·84	66·04	61 39·42	15 55	0 24·68	64·10
		79 13	62 2·88	2 27	0 0·59	63·47	61 49·34	11 45	0 13·47	62·81
			62 6·60	0 33	0 0·03	66·63	61 40·02	14 42	0 21·07	61·09
„ 22	W.	338 25	− 30 40 53·34	0 23	+ 0 0·02	− 30 40 53·32	− 30 40 59·54	10 48	+ 0 14·01	− 30 40 45·53
		&	41 1·62	8 0	0 7·65	53·97	40 47·48	6 3	0 4·40	43·08
		158 25	42 26·92	28 3	1 33·94	52·98	41 15·28	14 6	0 23·77	51·51
			43 27·38	35 54	2 33·70	53·68	41 37·30	20 52	0 52·02	45·28
„ 22	E.	338 25	− 36 61 6·92	24 16	− 0 57·29	− 37 1 64·21	− 36 61 46·20	11 4	− 0 11·93	− 37 1 58·13
		&	61 17·86	21 56	0 46·81	64·67	61 49·22	8 54	0 7·72	56·94
		158 25	62 0·18	3 49	0 1·42	61·60	61 32·46	15 33	0 23·59	56·05
			62 7·20	5 54	0 3·40	70·60	61 28·02	18 31	0 33·45	61·47
„ 23	W.	57 37	− 30 41 12·52	12 54	+ 0 19·94	− 30 40 52·58	− 30 40 50·16	4 23	+ 0 2·30	− 30 40 47·86
		&	41 43·60	20 26	0 49·95	53·65	40 47·98	3 33	0 1·51	46·47
		237 37	44 40·50	43 54	3 49·63	50·87	42 19·16	27 37	1 31·15	48·01
			46 18·40	52 31	5 28·01	50·39	43 20·98	35 58	2 34·39	46·59
„ 23	E.	57 37	− 36 61 50·08	11 45	− 0 13·47	− 37 1 63·55	− 36 60 37·78	28 42	− 1 20·12	− 37 1 57·90
		&	61 54·94	9 19	0 8·47	63·41	60 50·72	26 32	1 8·50	59·22
		237 37	61 27·58	18 56	0 34·94	62·52	61 57·32	3 3	0 0·90	58·22
			61 13·66	22 26	0 49·06	62·72	61 52·86	5 54	0 3·39	56·25

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 24	W.	136 49	– 30 40 55·76	8 55	+ 0 9·53	– 30 40 46·23	– 30 41 16·48	14 44	+ 0 26·02	– 30 40 50·46
		&	41 20·32	16 21	0 32·00	48·32	40 48·30	0 38	0 0·05	48·25
		316 49	45 25·48	48 6	4 35·40	50·08	42 33·52	29 19	1 42·68	50·84
			47 18·02	57 8	6 27·78	50·24	43 45·02	38 4	2 52·86	52·16
„ 24	E.	136 49	– 36 61 37·46	15 45	– 0 24·15	– 37 1 61·61	– 36 59 43·04	37 59	– 2 20·04	– 37 1 63·08
		&	61 46·56	13 19	0 17·26	63·82	60 10·52	32 3	1 39·78	50·30
		316 49	61 10·36	23 22	0 53·28	63·64	62 1·78	5 39	0 3·12	64·90
			60 56·10	26 12	1 6·97	63·07	61 57·64	8 15	0 6·64	64·28
„ 26	W.	180 1	– 30 41 8·08	12 57	+ 0 20·08	– 30 40 48·00	– 30 40 48·28	3 46	+ 0 1·70	– 30 40 46·58
		&	41 34·46	19 43	0 46·50	47·96	40 49·18	5 3	0 3·06	46·12
		0 1	44 30·12	43 7	3 41·52	48·60	42 18·68	27 4	1 27·54	51·14
			46 4·78	51 31	5 15·68	49·10	43 17·42	35 26	2 29·83	47·59
„ 26	E.	180 1	– 36 61 48·88	11 52	– 0 13·73	– 37 1 62·61	– 36 60 45·98	27 50	– 1 15·36	– 37 1 61·34
		&	61 53·30	9 42	0 9·18	62·48	60 57·04	25 15	1 2·05	59·09
		0 1	61 31·36	18 23	0 32·94	64·30	62 2·52	2 50	0 0·78	63·30
			61 18·86	21 13	0 43·88	62·74	61 59·90	5 30	0 2·94	62·84

Abstract of Astronomical Azimuth observed at XXXI (Kistama) 1864.

1. By Eastern Elongation of Cephei 51 (Hev.).

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	December 26		December 21		December 22		December 23		December 24	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	62·61	61·34	62·21	60·03	64·21	58·13	63·55	57·90	61·61	63·08
	62·48	59·09	66·04	64·10	64·67	56·94	63·41	59·22	63·82	50·30
	64·30	63·30	63·47	62·81	61·60	56·05	62·52	58·22	63·64	64·90
	62·74	62·84	66·63	61·09	70·60	61·47	62·72	56·25	63·07	64·28
Means	63·03	61·64	64·59	62·01	65·27	58·15	63·05	57·90	63·04	60·64
	° ′ ″		″		″		″		″	
Means of both faces	– 37 1 62·34		63·30		61·71		60·48		61·84	
Level Corrections	+ 0·83		+ 0·32		+ 0·72		+ 0·08		+ 0·06	
Corrected Means	– 37 1 61·51		62·98		60·99		60·40		61·78	
Az. of Star fr. S., by W.	182 50 57·09		58·70		58·38		58·06		57·73	
Az. of Ref. M. „	145 48 55·58		55·72		57·39		57·66		55·95	

Abstract of Astronomical Azimuth observed at XXXI (Kistama) 1864—(*Continued*).

2. By Western Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	December 26		December 21		December 22		December 23		December 24	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	48·00 47·96 48·60 49·10	46·58 46·12 51·14 47·59	49·59 53·67 49·15 52·60	48·98 47·40 46·98 48·11	53·32 53·97 52·98 53·68	45·53 43·08 51·51 45·28	52·58 53·65 50·87 50·39	47·86 46·47 48·01 46·59	46·23 48·32 50·08 50·24	50·46 48·25 50·84 52·16
Means	48·42	47·86	51·25	47·87	53·49	46·35	51·87	47·23	48·72	50·43
	° ′ ″		″		″		″		″	
Means of both faces	− 30 40 48·14		49·56		49·92		49·55		49·58	
Level Corrections	+ 0·84		+ 0·15		+ 1·27		+ 0·47		+ 0·80	
Corrected Means	− 30 40 47·30		49·41		48·65		49·08		48·78	
Az. of Star fr. S., by W.	176 29 42·40		43·95		43·64		43·33		43·02	
Az. of Ref. M. „	145 48 55·10		54·54		54·99		54·25		54·24	

		°	′	″
Astronomical Azimuth of Referring Mark ...	by Eastern Elongation	145	48	56·46
	by Western „	„		54·62
	Mean	„		55·54
Angle Referring Mark and XXXII (Pallakŏnda) *see page* 42—E. *ante*		− 65	47	1·76
Astronomical Azimuth of Pallakŏnda by observation		80	1	53·78
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 112—E. *ante*		80	1	58·28
Astronomical — Geodetical Azimuth at XXXI (Kistama)		−		4·50

At LX (Parampúdi)

Lat. N. 17° 12′ 38″·28; Long. E. 81° 14′ 37″·24 = 5ʰ 24ᵐ 58ˢ·5; Height above Mean Sea Level, 685 feet.
December 1861; observed by Captain J. P. Basevi, R.E., with Troughton and Simms' 24-inch Theodolite No. 1.

Star observed	δ Ursæ Minoris (West and East).
Mean Right Ascension 1861·0	18ʰ 17ᵐ 11ˢ
Mean North Polar Distance 1861·0	3° 23′ 51″·55
Local Mean Times of Elongation, December 19	Western 6ʰ 20ᵐ; Eastern 18 26

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 19	W.	180 0	− 6 13 14·60	12 22	+ 0 18·61	− 6 12 55·99	− 6 15 51·50	37 50	+ 2 54·18	− 6 12 57·32
		&	13 9·38	10 11	0 12·62	56·76	13 39·34	19 7	0 44·48	54·86
		0 0	13 8·22	9 22	0 10·66	57·56	12 57·36	2 55	0 1·04	56·32
			13 15·86	12 42	0 19·59	56·27	12 55·04	0 50	0 0·08	54·96
„ 19	E.	180 0	− 13 18 6·16	27 28	− 1 31·38	− 13 19 37·54	− 13 16 38·52	38 45	− 3 1·54	− 13 19 40·06
		&	18 21·36	25 26	1 18·37	39·73	16 57·06	36 35	2 41·87	38·93
		0 0	19 34·46	5 14	0 3·32	37·78	19 11·48	14 41	0 26·16	37·64
			19 37·04	2 33	0 0·79	37·83	19 19·20	12 20	0 18·45	37·65
„ 20	W.	259 13	− 6 14 14·52	25 18	+ 1 17·87	− 6 12 56·65	− 6 15 27·44	35 25	+ 2 32·59	− 6 12 54·85
		&	13 59·84	22 53	1 3·69	56·15	15 4·32	32 25	2 7·84	56·48
		79 13	12 56·26	1 0	0 0·12	56·14	13 14·90	12 45	0 19·76	55·14
			12 56·34	1 44	0 0·36	55·98	13 8·22	10 19	0 12·93	55·29
„ 20	E.	259 13	− 13 17 17·18	34 6	− 2 20·81	− 13 19 37·99	− 13 15 32·14	45 24	− 4 9·00	− 13 19 41·14
		&	17 39·58	31 30	2 0·22	39·80	15 55·36	43 4	3 44·18	39·54
		79 13	19 30·22	8 19	0 8·42	38·64	18 43·44	21 45	0 57·41	40·85
			19 35·62	5 8	0 3·21	38·83	18 59·64	18 32	0 41·71	41·35
„ 21	W.	338 25	− 6 13 36·36	18 30	+ 0 41·63	− 6 12 54·73	− 6 14 26·70	27 16	+ 1 30·45	− 6 12 56·25
		&	13 29·16	16 43	0 33·99	55·17	14 12·54	25 1	1 16·13	56·41
		158 24	12 56·04	2 11	0 0·58	55·46	13 6·68	9 42	0 11·43	55·25
			12 59·16	4 41	0 2·68	56·48	13 0·68	6 43	0 5·48	55·20
„ 22	W.	57 37	− 6 13 42·68	19 51	+ 0 48·00	− 6 12 54·68	− 6 14 58·98	31 44	+ 2 2·62	− 6 12 56·36
		&	13 32·02	17 49	0 38·67	53·35	14 39·80	29 15	1 44·20	55·60
		237 37	12 54·28	1 20	0 0·21	54·07	13 6·88	10 5	0 12·39	54·49
			12 56·76	3 46	0 1·72	55·04	13 1·80	7 11	0 6·29	55·51

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Dec. 22	E.	57 37	− 13 18 52·74	19 39	− 0 46·86	− 13 19 39·60	− 13 17 48·52	30 18	− 1 51·21	− 13 19 39·73
		&	19 5·02	17 24	0 36·75	41·77	18 5·94	28 18	1 37·05	42·99
		237 37	19 42·28	1 51	0 0·42	42·70	19 31·52	8 57	0 9·74	41·26
			19 38·76	4 17	0 2·23	40·99	19 34·72	6 49	0 5·65	40·37
„ 23	W.	136 49	− 6 13 40·88	19 41	+ 0 47·18	− 6 12 53·70	− 6 14 50·26	30 27	+ 1 52·89	− 6 12 57·37
		&	13 30·46	17 35	0 37·65	52·81	14 28·46	27 36	1 32·74	55·72
		316 49	12 56·50	4 19	0 2·27	54·23	13 7·36	9 37	0 11·26	56·10
			12 59·08	6 41	0 5·43	53·65	12 59·94	6 45	0 5·55	54·39
„ 23	E.	136 49	− 13 18 14·42	26 22	− 1 24·27	− 13 19 38·69	− 13 16 37·70	38 57	− 3 3·47	− 13 19 41·17
		&	18 25·74	24 28	1 12·59	38·33	17 0·94	36 12	2 38·57	39·51
		316 49	19 34·78	5 32	0 3·72	38·50	19 12·46	15 41	0 29·86	42·32
			19 37·26	3 37	0 1·59	38·85	19 18·16	13 42	0 22·79	40·95
„ 24	E.	338 25	− 13 18 24·36	25 4	− 1 16·18	− 13 19 40·54	− 13 16 28·20	39 57	− 3 13·00	− 13 19 41·20
		&	18 37·26	23 0	1 4·16	41·42	16 54·74	37 10	2 47·13	41·87
		158 25	19 38·52	4 43	0 2·71	41·23	19 33·56	8 21	0 8·47	42·03
			19 34·76	7 33	0 6·94	41·70	19 37·86	5 52	0 4·18	42·04

Abstract of Astronomical Azimuth observed at LX (Parampúdi) 1861.

1. By Eastern Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	December 19		December 20		December 24		December 22		December 23	
	″	″	″	″	″	″	″	″	″	″
Observed difference	37·54	40·06	37·99	41·14	40·54	41·20	39·60	39·73	38·69	41·17
of Circle-Readings,	39·73	38·93	39·80	39·54	41·42	41·87	41·77	42·99	38·33	39·51
Ref. M. — Star	37·78	37·64	38·64	40·85	41·23	42·03	42·70	41·26	38·50	42·32
reduced to Elongation	37·83	37·65	38·83	41·35	41·70	42·04	40·99	40·37	38·85	40·95
Means	38·22	38·57	38·82	40·72	41·22	41·79	41·27	41·09	38·59	40·99
	° ′ ″		″		″		″		″	
Means of both faces	− 13 19 38·40		39·77		41·50		41·18		39·79	
Az. of Star fr. S., by W.	183 33 21·72		22·09		23·39		22·76		23·08	
Az. of Ref. M. „	170 13 43·32		42·32		41·89		41·58		43·29	

Abstract of Astronomical Azimuth observed at LX (Parampúdi) 1861—(*Continued*).

2. By Western Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	December 19		December 20		December 21		December 22		December 23	
	"	"	"	"	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	55·99	57·32	56·65	54·85	54·73	56·25	54·68	56·36	53·70	57·37
	56·76	54·86	56·15	56·48	55·17	56·41	53·35	55·60	52·81	55·72
	57·56	56·32	56·14	55·14	55·46	55·25	54·07	54·49	54·23	56·10
	56·27	54·96	55·98	55·29	56·48	55·20	55·04	55·51	53·65	54·39
Means	56·65	55·87	56·23	55·44	55·46	55·78	54·29	55·49	53·60	55·90
	° ′ "		"		"		"		"	
Means of both faces	— 6 12 56·26		55·83		55·62		54·89		54·75	
Az. of Star fr. S., by W.	176 26 38·45		38·12		37·73		37·40		37·09	
Az. of Ref. M. „	170 13 42·19		42·29		42·11		42·51		42·34	

		°	′	"
Astronomical Azimuth of Referring Mark ...	by Eastern Elongation	170	13	42·48
	by Western „		„	42·29
	Mean		„	42·39
Angle Referring Mark and LXII (Nágaldurgam) *see page* 66—E. *ante*	... ...	— 56	1	33·48
Astronomical Azimuth of Nágaldurgam by observation	... ...	114	12	8·91
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 114—E. *ante*	... ...	114	12	15·14
Astronomical—Geodetical Azimuth at LX (Parampúdi)	... ...	—		6·23

November, 1889.

W. H. COLE,
In charge of Computing Office.

PLATE 1.

PRINCIPAL TRIANGULATION—MADRAS MERIDIONAL AND COAST SERIES.

Fig. No. 39.

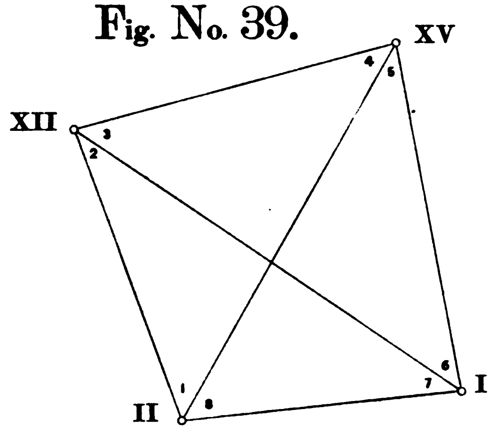


Fig. No. 40.

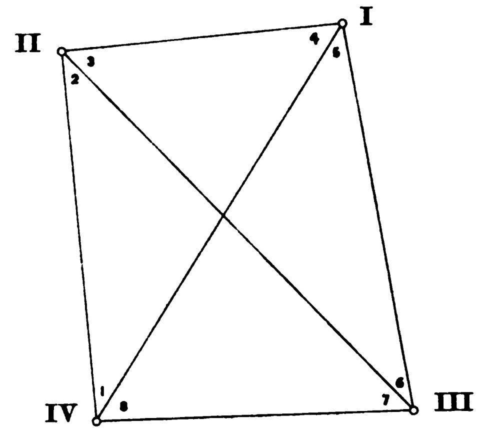


Fig. No. 41.

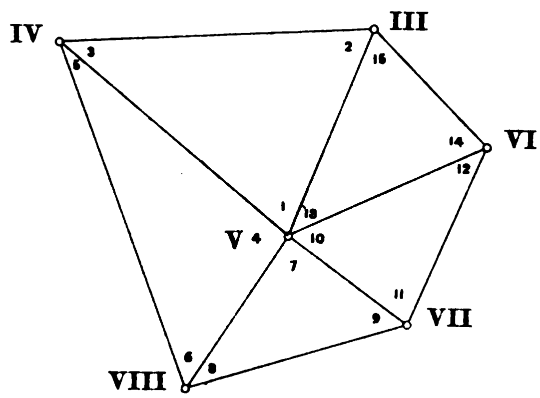


Fig. No. 42.

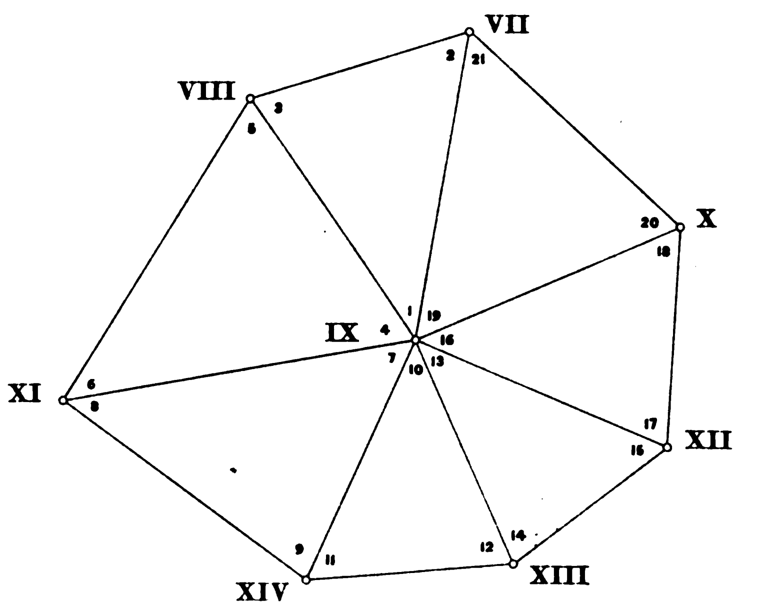
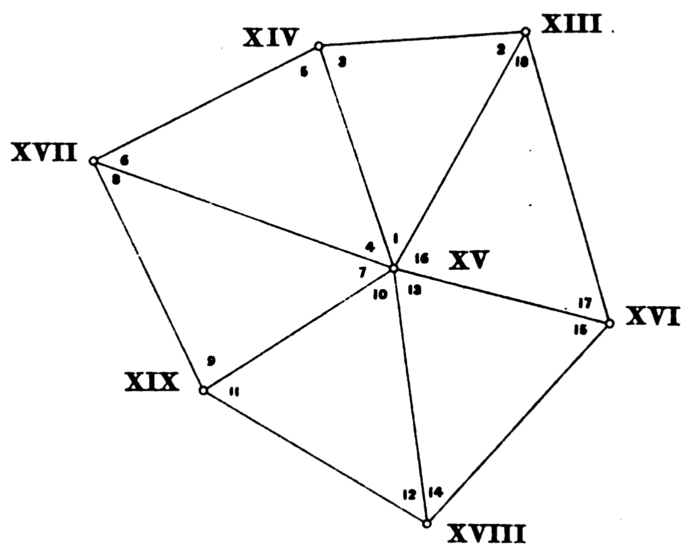


Fig. No. 43.



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, September 1887.

PRINCIPAL TRIANGULATION—MADRAS MERIDIONAL AND COAST SERIES.

Fig. No. 44

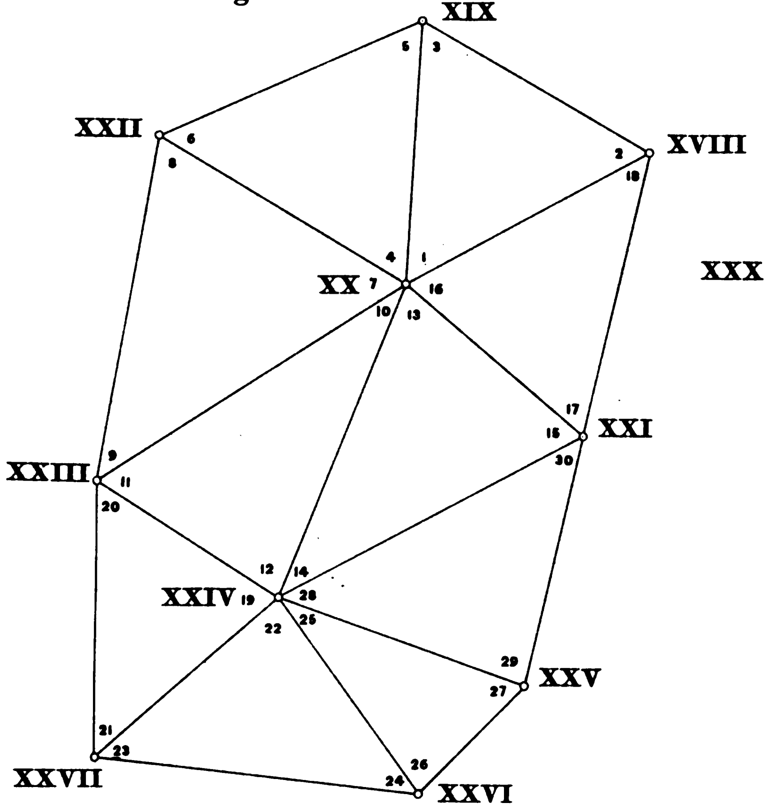


Fig. No. 45

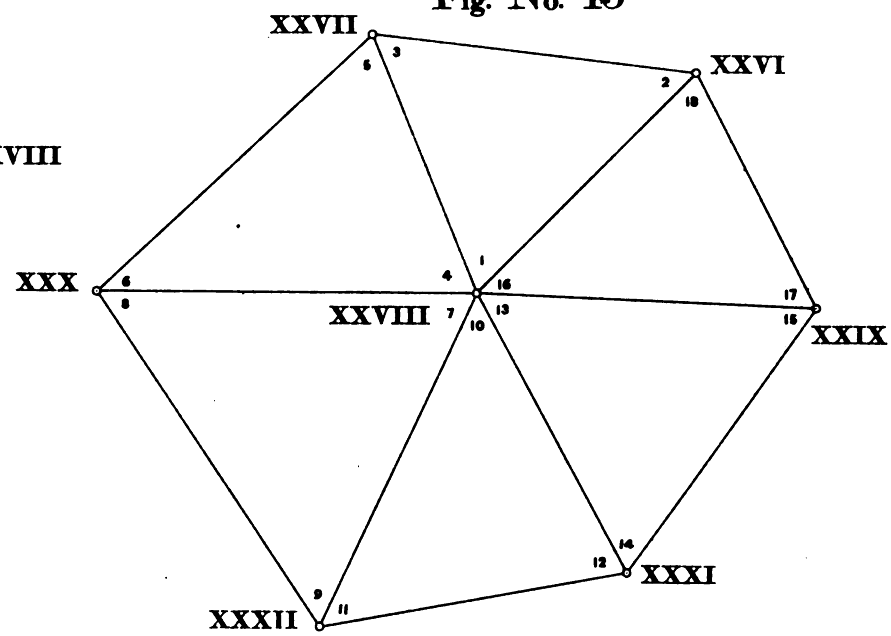


Fig. No. 46

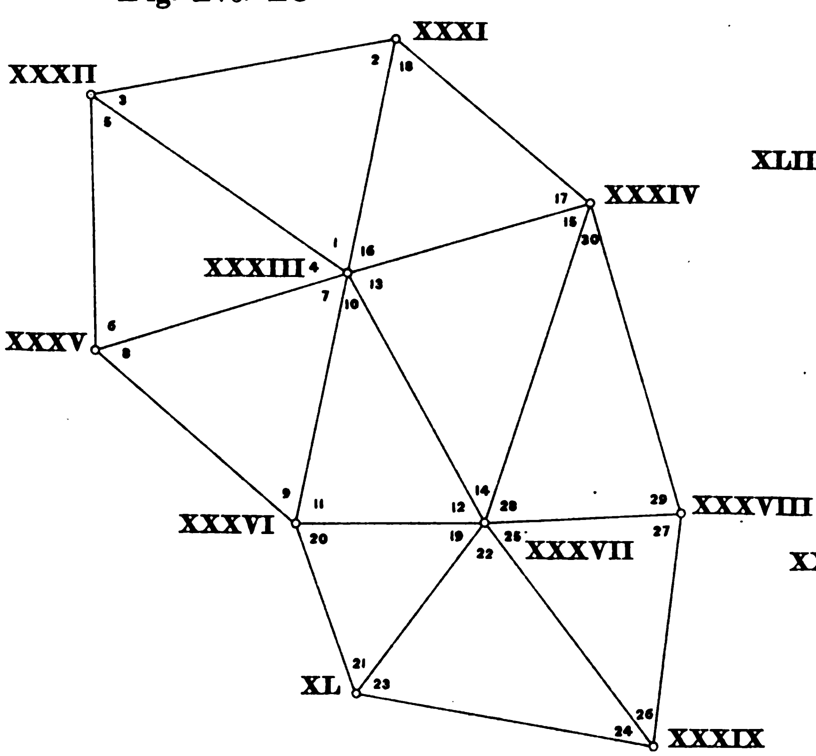
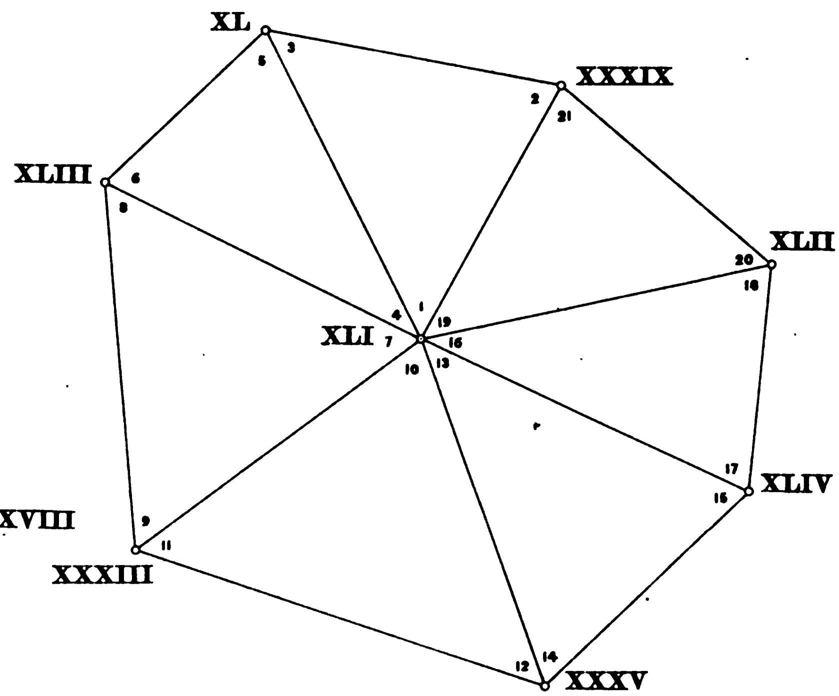


Fig. No. 47

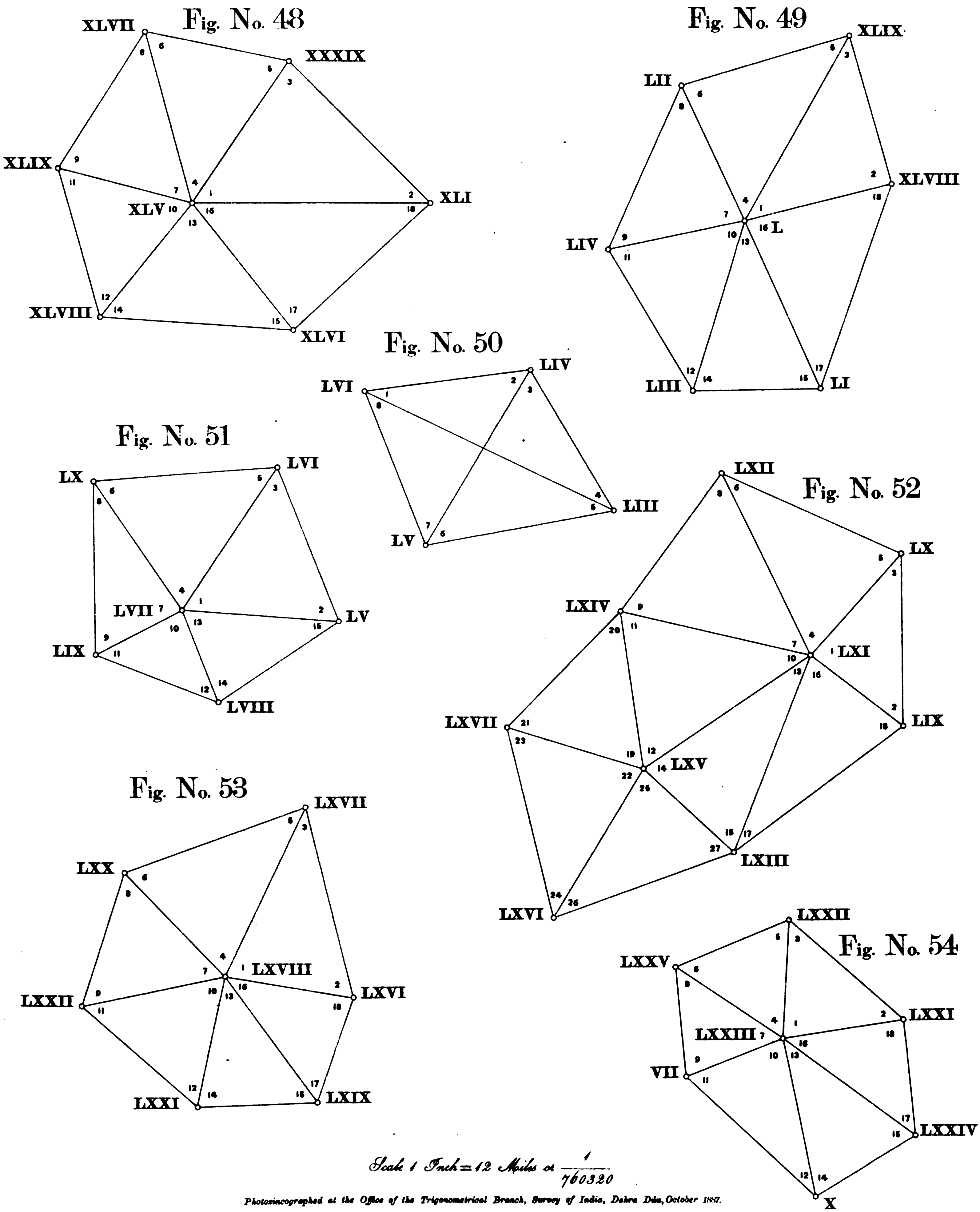


Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dun, September 1887.

Nibba Ram, Photo. C. O. Ollenbach, Exam.

PRINCIPAL TRIANGULATION—MADRAS MERIDIONAL AND COAST SERIES.



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, October 1887.

C. G. Ollenbach, Zinco.

SOUTH-EAST COAST AND CEYLON BRANCH SERIES.

SOUTH-EAST COAST AND CEYLON BRANCH SERIES.

INTRODUCTION.

The South-East Coast Series of triangulation runs southwards from Madras along the coast to Ramnad (Rámnáthapuram), and thence along the parallel of 9° 30′, till it meets the Great Arc. The portion between Madras and Ramnad was formerly known as the Madras Coast Series, and the remaining portion between Ramnad and the Great Arc as the Ramnad Longitudinal Series, but when the reduction of the Southern Trigon was commenced, it was decided to combine the two into one, and designate it the South-East Coast Series. The triangulation connecting the Indian peninsula with the island of Ceylon emanates from a side of one of the polygons of the series under review, and its details are therefore included with those of the main series; it is known as the Ceylon Branch Series, and does not enter into the simultaneous reduction of the Trigon.

Triangulation had been commenced in the southern portions of the peninsula by Colonel Lambton, at the beginning of the present century, and had been carried down the coast from Madras to Negapatam (Nágapatnam); but it here consisted simply of a narrow chain, following the coast-line, and avoiding the interior, which is flat and covered with trees, and which was found to be altogether too difficult to be touched during those early days of the trigonometrical survey, when as yet no method of taking the operations through tracts of forest had been devised. From Madras to Tranquebar (Tarangambádi) this chain consisted of a principal series, which Colonel Lambton had carried out for the purpose of measuring an arc of meridian and thus determining a value for the radius of the earth. Contemporaneously with this series the sea-port towns of Pondicherry (Puducheri), Cuddalore (Gúdalúr), and Porto Novo (Farangipetai) had been fixed by secondary triangulation, and a minor series had been carried south from Tranquebar to Negapatam, which was also connected by further secondary work on the parallel of 10° 50′ with Tanjore (Tanjávúr). The triangulation on this parallel was produced west to Trichinopoly (Tiruchinnapalli), where it joined the general net-work, which was spread over the interior of the country and from which the Coromandel Coast Series had originally emanated in the neighbourhood of Madras. A complete circuit was thus formed and a base-line of verification measured at Tanjore in 1808, but no triangulation was commenced on the coast-line south of Negapatam, till

Lieut.-Colonel Walker became Superintendent of the Great Trigonometrical Survey. Unfortunately the greater part of Colonel Lambton's operations on the Coromandel Coast are valueless, owing to the stations not having been preserved. A few out of the vast number, he observed at, have been identified and are now incorporated as secondary points with the modern triangulation. In 1873 Lieut.-Colonel Walker decided to commence a principal series at Cape Comorin, which was to follow the line of the coast to Madras, and from which a branch series to Ceylon was to emanate, and he issued orders for the execution of the work to Major Branfill who was about to complete the southern section of the Great Arc. This officer after closing the Great Arc triangulation on the Cape Comorin base-line in February 1874 took advantage of the remaining clear weather by reconnoitring the Straits of Manar with a view to ascertaining the practicability of a trigonometrical connection with Ceylon. The straits were first examined at Adam's Bridge, where they are narrowest; but the islets composing the bridge were found to be sand-hillocks, which for the most part were covered by the sea at high-water, and were only accessible at low-water during fine weather; they were thus most unpromising positions for the construction of suitable stations, and it was soon found necessary to abandon all idea of crossing them. Higher up, on the line between Rámesvaram and Jaffna, are several islands, composed of coral and sand-stone; these were next visited, and found suitable for the erection of stations. The nearest to the Indian coast was Kachi Tívu, a small island not more than a mile in diameter, but standing well out of the water, and visible from the island of Rámesvaram on one side and from that of Neduvan Tívu on the other. Here Major Branfill decided to construct two stations at a distance of about a mile apart, and to fix their positions by observations at them, and at the Rámesvaram stations: finding that no difficulty would be experienced in connecting them with the island of Neduvan Tívu, he returned to the mainland and took up the work of the southern portion of the South-East Coast Series on the parallel of 9° 30′. In December 1873, Mr. Belcham had been sent to reconnoitre the country, and to commence laying out the approximate series. He found the line would have to run through an unbroken plain of black soil, generally under cultivation, with high standing crops, and plentifully wooded with groves of mango, tamarind and palm trees, the view being everywhere obstructed by long lines of high banks of tanks and irrigation channels, and after a very careful and detailed examination he reported the country unsuitable for the great triangulation. It was evident that every ray must be tediously traced and cleared in the regular manner, and that high towers would be required even for comparatively small triangles. It was impossible to lay out and prepare any stations of the new series in time for observation before the end of the field season; Major Branfill therefore abandoned the intention and sent the large theodolite into store; he then proceeded to lay out the series himself, directing the assistants to build the new stations, as soon as selected. After a careful examination of the country, he found that, following the most favorable line, namely that bordering the sea on the parallel of 9° 15′, where advantage of the coast-line sand-hills could be taken, he could not reach Ramnad, distant only 64 miles, by less than 16

Season 1873-74.

PERSONNEL.

Major B. R. Branfill,	Dy. Supt.,	2nd	Grade.
Mr. G. Belcham,	Asst. Surveyor,	1st	„
„ C. D. Potter,	„ „	1st	„
„ J. Bond,	„ „	3rd	„
„ E. W. Lasseron	„ „	3rd	„

triangles, forming a single series. By the addition of three stations, he was enabled to convert this into a double series, and thus concluded the approximate work. The party returned to recess at Bangalore (Bĕngalúr) on 26th May.

Season 1874-75.

PERSONNEL.

Major B. R. Branfill, Dy. Supt., 2nd Grade.
Mr. G. Belcham, Surveyor, 4th Grade.
„ C. D. Potter, Asst. Surveyor, 1st Grade.
„ E. W. Lasseron, „ „ 2nd „

In the next field season Major Branfill's party was deputed to commence the southern portion of the South-East Coast Series, which had been approximately laid out the previous season. The party took the field at Bangalore on the 9th of November, reached Trichinopoly on the 6th of December, Madura (Madurai) on the 12th, and the scene of operations on the 20th. A week was occupied in building the stations and clearing the rays, and it was not till the 29th of December, that observations were commenced. The first stations visited were those of Kulayanallúr and Koilpati, forming a side on the east flank of the Great Arc, and by the 20th of January final observations at the six stations forming the first two quadrilaterals were completed. Mr. Belcham, who had been hitherto engaged in continuing the approximate series, was then recalled to the main party to take up the observations, whilst Major Branfill himself proceeded to carry on the approximate work. Mr. Potter and Mr. Lasseron were occupied in building stations and clearing rays.

The stations of the north flank and centre of the series were hollow masonry pillars fifteen to twenty feet in height, banked up with earth and gravel as high as practicable to prevent vibration, with a timber scaffolding to support the observatory tent and run up to a much greater height for the signal. The south flank lay along the series of sand-hillocks and ridges, that skirt the coast, enveloped for the most part in dense palm forest. The shifting hillocks of drift-sand were not suitable for permanent principal stations; but by means of temporary stations composed of wooden piles, all the permanent buildings on the coast, which could be observed, were fixed, and the series rendered double throughout. Large mark-stones were buried deep in the sand, which will be recoverable for many years to come, as a pile of coral stones was placed over each to mark the site more permanently in case the sand shifted.

It was found by experience that a considerable reduction of expense might be effected by the adoption of only low masonry pillars and platforms, no larger than absolutely necessary for the sake of permanence, in place of the usual high towers. The South-East Coast Series was commenced by building scaffoldings, ten of which with a mean height of 21 feet cost Rs. 1,750; in addition to this the cost of the observatory platform was Rs. 40 at each pillar, so that the average expenditure amounted to a total of Rs. 215 per station, exclusive of supervision: a different plan however was adopted after the series had been extended for 30 miles, and log or pile stations were constructed for the sand-hills, and low masonry piers for the ordinary soil, with lofty scaffolds for the signals. The average cost of eleven observatory signal scaffolds with a mean height of 27 feet was found to be only Rs. 30, and that of low masonry platform stations about Rs. 20, making a total of Rs. 50, and shewing a saving of Rs. 165 per station. The station, that was found best adapted for this series and most economical, consisted of a masonry pillar, 3½ feet in diameter—in which were placed two mark-stones—surrounded by an annular wall from 13 to 18 inches thick: outside the annular wall three pillars of masonry were built for the support of a portable wooden stand, strongly braced, and 17 feet high, to carry the instrument: at the level of the top of this stand, the first platform was built, 10 feet by $8\frac{1}{2}$ feet, the platform was supported at its four corners by scaffolding poles, 40 feet high, on the top of which a second platform was constructed to carry the signal lamp. One disadvantage of these lofty scaffolds was the difficulty of plumbing the signal apparatus in a high wind; this was obviated by using heavier plummets supported by fine brass wire, and by protecting the plumb-line by a long strip of cloth or matting spread on the windward side. The stations at which the braced tripod stand was used have been designated "trestle stations."

By the end of the first week in March the approximate series on the south flank and centre was complete as far as Ramnad. The south coast from the land's end (Tonithurai = "boat ferry") opposite Pámban, for 50 miles to the westward, was fringed with a belt of dense palmyra forest, intermixed with groves of cocoa-nut trees, through which it was very difficult indeed to carry on the series, but there was no alternative feasible. To traverse or "trace" each ray through the forest was possible, but to "clear" it quite impracticable; to overlook it was the only thing to be done, although the palms grew to a height of 60 feet and the ground was generally quite flat. At a distance of a mile or so inland from the sea-shore there was a ridge or series of hillocks, rising from 10 to 50 feet above their base, formed probably by the constant action of the sea breezes blowing the dry surface sand of the beach inland, and depositing it in the palm forest, where it is sheltered from farther action of the wind. The most promising of these sand-hillocks having been selected for stations and high flags having been erected on them, the line between them had to be traversed, and the height of the intervening hillocks and palm trees carefully noted. This, it was found, could only be done by climbing the highest palms and examining the height of the forest in the direction of the ray. About midway the most prominent palm in or near the line was sought for and marked with a flag, whence the flags of the two station sites at the ends of the line could be seen; a sextant was then used to measure the angle contained by the rays to the station flags, which, with the traversed distances, gave the approximate position of the true ray, and by examining the top of the forest, it could be then judged, whether the ray was likely to prove practicable or not, and where most clearing was necessary. The direction of the ray having been found apparently feasible, a trial line had to be carried from one or both ends over the palm-tops, the leaves of which had to be cut off, so as to make a clear gap of 10 or 12 feet in the forest. If the trial line proved all right, it had to be widened by cutting down some scores of trees, the price of which (from one to four shillings each) was settled and paid to the owners. As the sand-hillocks did not attain the height of the palms by 15 or 20 feet, the eye and signals had still to be raised, and for this purpose Major Branfill prepared the portable braced stand of wood, which has been already described. The long scaffolding poles which were required to support the upper platform, so as to give the additional height to the signals, that was necessary, were easily obtainable, and the stalks of the palmyra leaves furnished the rope, by which the scaffold was put together and made fast.

In one instance Major Branfill met with a great disappointment and the loss of several days. The lofty gopuram, or entrance tower, of the Tirupullani temple, a sacred Vishnu fane, offered a tempting site for a station, 80 feet above the ground, by which five rays to adjacent stations over the palm forest were well commanded. He visited the place and was allowed to mount and observe with a small theodolite from the summit of the tower without demur, and was informed, that he might use it as a station, if he engaged to do no damage, that he would not make good. When however he came subsequently to prepare the station, and had taken the necessary measurements for the platform, &c., the brahmans attached to the temple, and the inhabitants of the village, that profit by the temple funds, turned out to the number of some hundreds, and surrounded his tents in a state of much excitement, protesting against his again entering the tower, unless he was prepared to pay many thousands of rupees for its purification, whilst some of them demanded money for the pollution that had already occurred through his presence. Major Branfill, describing this incident, writes:—" I tried for " sometime to conciliate them but without effect; they refused me further access, locked the " door, and kept a watch to prevent by force any attempt on my part to effect an entrance, " which of course I did not make, though it was with much reluctance that I felt obliged to " abandon so advantageous a site. I afterwards learnt, that on the day of my first visit a " subscription was made and a sum of one or two rupees collected to enable the priests to " perform certain purification ceremonies on account of my visit. On hearing this I sent " word to the temple manager, that I was ready to pay a rent equal to the amount of any " such expiatory sacrifices, as they deemed absolutely necessary, for as long as we occupied " the tower, but they refused. They added, that they had already caused the unhallowed " Government telegraph wire to be removed from passing too near their holy building to a " distance of some hundreds of yards, and that they could not let me use their tower at any " price. No anger or ill-will was displayed on either side, but I was not prepared for such " persistent obstructiveness, considering I had already established a station on the unfinished " gopuram at Uttarakoshamangai, a celebrated Shiva temple only a few miles distant, with- " out any difficulty. The gopuram, or entrance tower, of any Indian temple, is perhaps of " less use, from a religious point of view, than the ordinary tower of an old English church; " and in this instance, as is common in Hindu temples, the tower, being only the resort of " monkeys and bats, and seldom or never cleaned, was in a most filthy state, and so disgust- " ingly loathsome as to be almost unendurable to any one passing through it. That my " presence should be thought a greater pollution to the temple than that of these unclean " beasts and birds reveals a state of mind, that is somewhat remarkable. I lost no time in " searching for another point, but the delay caused by the abandonment of this cost me about " a week in the busiest time of the season".

Major Branfill's next occupation was to extend the series to Rámesvaram with a view to the Ceylon connection. After a careful examination of the country to the south-east of Ramnad, he found that the increasing density of the palm forest and the rapid narrowing of the land would make it necessary to utilize the islets of the coral reef, which lie parallel to the shore of the main-land at the distance of 4 or 5 miles. He accordingly threw out a quadrilateral to the southward based on the south-easternmost side of the triangulation, which lay convenient for the purpose, and found no great difficulty in extending the series by a succession of quadrilaterals as far as the land's end.

The islands were scarcely above the sea at high-water of spring tides, and were composed of coral and sand; they were devoid of fresh water or any thing to live upon, but were covered with grass, bushes and trees, the last being planted by the fishermen who resort there from the main-land: several of them were densely covered with high tangled shrubs, that caused much trouble in clearing the rays. Labor, material, food and water had to be transported thither by boat, and as constant communication by open boats or canoes had to be maintained, there were only about three months, February, March, and April, between the monsoons, during which this work could be carried on. High scaffolds were required at all of the island stations, and in building these only one accident occurred throughout. This was a matter of congratulation, as all the party were inexperienced in the kind of work, and their materials and implements were of the most unwieldy and roughest description. An ordinary palmyra freshly cut down weighs about $1\frac{1}{4}$ tons, and each half tree, over 40 feet in length, probably $\frac{1}{3}$ a ton, to raise which there was only a working party of from 12 to 20 common coolies, and 3 or 4 klassies. A few stout bamboos for sheers, props, &c., a set of tackle and plenty of cocoa-nut fibre rope were all the implements available, but they proved sufficient for the purpose. The one accident, alluded to, occurred by a faulty beam, injured in the felling of the tree, having been inadvertently used on the top of the scaffolding to support the signal platform: whilst it was being removed, it gave way, and two klassies were precipitated to the ground from a height of 30 feet, but neither was seriously hurt.

Major Branfill completed these stations and cleared all the rays by the middle of April, when he found it necessary to desist, as it was useless to prepare the remaining stations in advance, some of which, being situated on hillocks of drift-sand, were necessarily temporary stations. He then visited the islands of Kachi and Neduvan (or Delft) and ascertained that there would be no great difficulty in any of the remaining rays.

Mr. Belcham meanwhile had been pushing on the final observations with vigour and success and except for one or two days, when he overtook the building parties, had experienced no interruption. He closed work on the 1st of May, as the entire party was much exhausted, and a large portion of it sick.

The district passed over is as flat as possible, with a slight slope downwards towards the sea of a few feet per mile. Inland the surface of the country is generally deep black soil which is immediately succeeded near the coast by deep sand. The black soil is extremely rotten, and becomes impassable in wet weather: it is covered with dense woods, and intersected by a net-work of bunds, dykes, supply-channels, and tanks; crops of corn growing to a height of ten feet are to be seen in all directions, and every tank bed is overgrown with a dense thicket of thorns of a kind of hard and matted "bábul" (*Mimosa Arabica*), that is exceedingly tedious to clear. Except for the occasional sand-hillocks, the vicinity of the coast offers no advantage over the inland tract, being overgrown with palm forest, thorn jungle, and cocoa-nut groves.

Compared with former work, when hill stations were available, the signals were diffused and the observations wild. Excepting the first few, nearly all the rays were unavoidably low, grazing within ten or fifteen feet of the ground, and a few much closer still. Eleven of the rays were more or less clear over the land, giving a mean factor of positive refraction = + ·023 of the contained arc. Thirty-six rays grazed the surface more or less badly, giving a mean factor of negative refraction = — ·111; the largest of these was — ·289, and there were several others about one-fourth of the contained arc. Of sixteen rays over the sea, some clear and some grazing, only one gave negative refraction, — ·037, the rest were all positive, and generally lay between + ·020 and + ·040, the mean being ·032 of the contained arc, or about half that of an ordinary series of hill stations.

Season 1875-76.

PERSONNEL.

Major B. R. Branfill, Dy. Supt., 2nd Grade.
Mr. G. Belcham, Surveyor, 4th Grade.
„ C. D. Potter, Asst. Surveyor, 1st Grade.
„ E. W. Laseron, „ „ 2nd „
„ A. Bryson, „ „ 3rd „

Work was resumed in the next field season. The main body of the party to the number of 70, under the Tindal and Daffadár, left recess quarters at Bangalore, and marched by the usual route for Madura on the 13th of October 1875, but on entering Salem (Selam) on the 22nd, were put in quarantine by the District Collector in consequence of cholera of a virulent type having broken out amongst them, three cases proving fatal. On hearing this, Major Branfill at once proceeded to join the party by train with medical aid, and found the men in a state of panic and deserting rapidly. All those newly engaged refused to go on, demanding their discharge or to be taken back to their homes and families at Bangalore at once. Cholera being very prevalent in the Dindigul (Tindukal) and Madura districts ahead, and worse in rear on the route by which they had come, it became absolutely necessary to take them by railway to Mysore territory, as they positively refused to remain where they were; no fresh cases occurring after this, the party obtained a clean bill of health, and was marched into Bangalore under Mr. Bryson on the 2nd of November. On the 15th November, the entire party, recruited in numbers and re-established in *morale*, again left Bangalore for the field, proceeding by rail as far as Madura, and commenced operations on the approximate series at Ramnad on the 1st of December, having left the 24-inch theodolite in deposit at Madura until actually required for the final observations. The remaining portion of the island series for the Ceylon connection could not be begun till the end of January, when the violent wind of the north-east monsoon moderates. Before this open boats, the only craft that funds admitted of, were not able to ply between the islands of Palk's Straits to the east of the Pámban Channel and Adam's Bridge, and keep the signal and observing parties furnished with water and supplies. The following arrangements and disposition of the party for the prosecution of the work were therefore made:—The country to be traversed being low, flat, and much wooded, like that of the last season, and very few stations and no rays being ready for observations, the entire party was placed upon the approximate series, and divided into five equal working detachments. Mr. Belcham kept to the east flank stations and rays, Mr. Potter to those of the west flank, while Major Branfill, Mr. Laseron, and Mr. Bryson prepared the centre of the Series.

From the unusually heavy rains of the autumn the country was at first barely passable, causing great hindrance. On the east flank and centre however work proceeded fairly well; but on the west Messrs. Potter and Laseron were greatly delayed on their first rays, although they were between stations which they had themselves selected and built at the close of the last season. By the end of January, after two months incessant hard work, only two hexagons were completed, and on the 9th of February Major Branfill commenced the final observations. He next proceeded to the centre station of Manĕgandi, and observed the usual azimuth of verification, in which he found no inconvenience, want of stability, nor any unusual tendency to dislevelment in the theodolite from the use of a tripod stand, 17½ feet high. Mr. Belcham was then called in to take up the final observing on the Ceylon Branch Series, leaving Messrs. Potter and Laseron to continue the approximate series on the south-east coast in advance for the next season, whilst Major Branfill proceeded to Rámesvaram island to complete the approximate work for the Ceylon connection, which he found no difficulty in doing during the month of March. The two stations on the small island of Kachi Tívu served as a base to determine the positions of the two next stations which were erected at the extremities of Neduvan Tívu, an island seven miles long belonging to Ceylon. The Ceylon Government constructed towers of a sufficient height to overlook the dense growth of palm trees with which the island was covered, and to command the requisite view all round and serve as stations of triangulation. The positions of these towers, as well as the stations on the island of Kachi Tívu, were fixed from the side of India by Mr. Belcham with one of the first-class theodolites of this Survey: the acuteness of several of the angles involved in the triangulation, necessitated the employment of the best instruments which could be provided for the measures of the angles: in this respect the instrumental equipment of the Indian Survey was much superior to that of Ceylon. Colonel Fyers, R.E., the Surveyor General of Ceylon, evinced great interest in the operations, and heartily co-operated with the Superintendent of the Great Trigonometrical Survey of India, Lieut.-Colonel Walker, R.E., in the matter. Mr. Belcham was considerably delayed by contrary winds and foul weather, but succeeded in completing the observations of the final angles by the 25th of April: at one station he obtained the first night's observations, but could get no more for some days, until he had raised the instrument on piles about 8 feet higher, because the setting in of an unusually high southerly wind caused the waves of the intervening sea to obstruct the view. The station on the sand hill near Rámesvaram, which was observed in the previous season, could not be found, having been buried deep in the shifting sand, and it was necessary to establish a new one. This station caused much anxiety, and a great deal of time was spent in watching it during the observations lest it should be blown away or buried again. It consisted of a long 10-foot pile of hard wood driven into the sand at the top of the highest hillock, where there remained just below the surface some of the moisture of the preceding autumn's rains: but as fast as the sun evaporated the moisture the wind, which was uncommonly high for the season, blew away the surface sand daily to the depth of 4 or 5 inches or more; and it was only by continually replacing it, and by freely watering and beating it to a smooth and compact mass, that the pile and mark were preserved.

After seeing the completion of the island series Major Branfill, having obtained furlough to England, proceeded to Bangalore to make over charge of the party to Captain W. M. Campbell, R.E. The work performed during the season consisted of two hexagons on the South-East Coast Series, and of a hexagon and quadrilateral on the Ceylon Branch, forming in all a chain of triangles 80 miles in length, and including observations at 21 principal stations. An azimuth of verification was also observed at Manĕgandi station.

During the following recess Captain Campbell took steps for obtaining greater elevation at the stations in order to gain clearer rays. Hitherto the height of the telescope of the theodolite had been about 30 feet from the ground, and that of the signal platform 40 feet, and it seemed better to raise the latter, if possible, than to alter the tripod stand. Accordingly a trial signal platform was erected to a height of 58 feet without serious trouble. Mr. Belcham watched the behaviour of this platform by observing the lamp on the top through a theodolite at a convenient distance, and found that under a strong breeze blowing in gusts the extreme deflection was not above an inch, the platform recovering itself when the wind dropped. This shewed that such a platform might well be trusted for rays averaging 10 miles in length, on which one inch subtends an angle of about 0·33 of a second.

One point in the reduction of this work called for special notice, *viz.*:—the remarkable and rapidly increasing difference between the sea level and that deduced from the trigonometrical heights of the triangulation running along the coast with one flank on islands and latterly entirely on islands, for the purpose of the Ceylon connection. By spirit levelling connecting the tide-gauge at Tuticorin (Tútugudi) with the Cape Comorin base the error of the trigonometrical heights there was —7 feet. In the season 1874-75 when the series first struck the coast 110 miles from the base-line, the error was found to be — 10·7 feet, increasing to — 12·4 feet in a farther distance of 30 miles. In the season 1875-76, this error of —12·4 feet, after two figures extending 40 miles over sea and islands, had increased to —14·7 feet. The progression is by no means regular, as there were cases of —18·7 feet and —17·2 feet between the initial and closing errors of —12·4 feet and —14·7 feet respectively. These facts tend to show, that the refraction affecting grazing rays over the sea is so irregular as to make vertical angles untrustworthy.

Season 1876-77.

PERSONNEL.

Captain T. T. Carter, R.E., Dy. Supt., 3rd Grade.
Mr. G. Belcham, Surveyor, 4th Grade.
„ C. D. Potter, Asst. Surveyor, 1st Grade.
„ A. H. Bryson, „ „ 3rd „

The charge of the South-East Coast Party was taken over by Captain Carter on his return from furlough, on November 20th 1876, from Captain Campbell, R.E., who had held it as a temporary measure during the preceding recess. As soon as all arrangements were made the party left Bangalore and arrived at Tanjore on December 1st. Work was commenced on the Ŏkkúr polygon: the angles at the two stations of continuation had been already observed during the preceding season, but the scaffoldings which formed the platforms for the observer and signallers at the three next stations required considerable repairs before they could be used: the platforms for the remaining three stations of the figure had to be constructed, and the rays finally opened out. With reference to the Merpanaikád or second hexagon selected in advance, there was still some uncertainty as to whether the two last stations would be visible from the central station, and Mr. Belcham was directed to proceed there and at once satisfy himself that mutual visibility could be obtained and if not to select other sites. Mr. Belcham set to work with his usual zeal and luckily it was found that there was no obstacle to obtaining rays between these stations.

Owing to the famine prevailing in Southern India there was a difficulty in procuring provisions; rice was selling at five seers for a rupee, the people had migrated in large numbers to Ceylon, and those that were left seemed little inclined to part with their grain; moreover there was a threatening of a water famine, the tanks by the middle of December being nearly dried up. However, by suitable arrangements, the difficulty of feeding the camp was got over; and when on the 23rd of December heavy rain fell continuing for three days all fear of a water famine was over.

Observations were begun at Sembalavayal Station on the 27th of December, and completed on the 30th. By the end of January the final angles at six more stations had been observed, Captain Carter and Mr. Belcham working together. On arriving at Merpanaikád Station, the latter was deputed to continue the approximate work on which he was employed till the close of the field season. His progress was greatly retarded by the unfavourable nature of the ground and the heavy cutting that had to be got through, and from the 5th of February to the 14th of April he only succeeded in completing the selection and building of three stations and the clearing of the rays between them: the aspect of the country consisted of paddy fields hedged round with *bábul* trees very difficult to get through, and the ground was much cut up with watercourses.

As the triangulation was approaching that of Colonel Lambton's executed in the year 1800, Captain Carter endeavoured to find out if any marks were to be seen on the different pagodas shewn on the old chart, which were evidently used by the Colonel as stations of observations. The pagodas of Manárgudi, Álangudi, Kumbakonam, and Tanjore were examined for this purpose, as well as the *gopuram* or "gateway" leading into the enclosure in which the pagoda stands; the general description given of these stations in the old records, is "on the pagoda," though in all probability the instrument was placed on some part of the *gopuram* which is usually a far loftier structure than the pagoda or temple. In no instance was a mark found. An endeavour was also made to discover the terminal points of the Vellum base-line in case it was thought desirable to connect it with the new triangulation, but without success: as far as the work had been carried this season the only station of Colonel Lambton's triangulation, the exact position of which could be identified, was that at "Boodilloor," the mark-stone of which was protected and kept in repair by the Civil authorities.

Troughton and Simms' 24-inch Theodolite No. 2 was the instrument used during the season; it gave good results, though there was a tendency for the readings to diminish on the return to the same point, and this whether the telescope was moved from right to left or left to right; it was particularly perceptible when the azimuth at Pátharankota Station was being observed, where the referring mark was constantly intersected. Captain Carter attributed this to the expansion and contraction of the 17½ feet tripod stand which had in this Series taken the place of the ordinary masonry pillar. In the beginning of the season the stand was protected from the prevailing wind from the north-east; the extremes of temperature were not so great, and it was not till March that this peculiarity became apparent. By protecting the stand on all four sides, though there was still a tendency for the readings to diminish, the decrements were much less. The most curious feature in the case was that the levels attached to the body of the instrument, (and one of them was a particularly sensitive one) remained very constant. The triangular errors were large, but this could be accounted for by the rays being grazing and often passing over tanks and rice-swamps; the signals were steady, and only on one occasion had work to be stopped on account of unsteadiness, and then it was due to the lamp-man neglecting to isolate his lamp from the part of the platform on which he sat.

During this field season Captain Carter extended the principal triangulation from the south, to the edge of the great plain of Tanjore, which is commonly known as the Cauvery (Káveri) delta, and selected the stations for another hexagonal figure in advance; he was relieved on the 1st of June by Lieut.-Colonel Branfill.

Season 1877-78.

PERSONNEL.

Lt.-Colonel B. R. Branfill, Dy. Supt., 2nd Grade.
Mr. G. Belcham, Surveyor, 4th Grade.
„ C. D. Potter, Asst. Surveyor, 1st Grade.
„ A. H. Bryson, „ „ 3rd „

Work was resumed in the following November, and for the first month the whole strength of the party was brought to bear on the operations for the selection of additional stations in advance. Heavy rain fell at this time and the country became a vast paddy (rice) swamp, which, though bright and green, and a glorious sight for the eyes of persons just arrived from the dried-up and famine-stricken province of Mysore, was deplorable from a Surveyor's point of view; the ground was saturated with water, and thus to quit the high roads without sinking deep in mud was practically impossible; every square yard moreover excepting only the surfaces occupied by the villages, towns and roads, was under rice cultivation.

The triangulation was carried over the Cauvery delta and into the valley of the Coleroon (Kolladam) river; but this was done with great difficulty, and only after much careful examination of the ground, with a view to finding the lines which presented fewest obstacles and greatest advantages; for the country was much wooded and intersected by numerous water-channels. Colonel Branfill writes :—" But for the existence at Kumbakonam of a lofty tower, "appertaining to the Provincial College, which afforded a sufficient height (72 feet) to overlook "most of the cocoa-nut and other trees—of which there are dense groves in and around the "tower, and which are so valuable as to make their removal prohibitory, even were their pro-"prietors at all willing to allow them to be cut down at any valuation—the passage of the delta "might not have been effected". Further on at Tirupanandál, a "mandap" or detached open temple was met with, the flat roof of which was also found to be a suitable site for a principal station. In all other cases stations had to be specially constructed on the general level of the ground; and the selection of suitable sites, with the minimum of trees and other obstacles on the lines between them, was a most difficult and trying operation.

The out-turn of work by the close of the field season, whether measured by the area covered or the length of line spanned by the final triangulation, was in consequence small. The number of principal angles measured with Troughton and Simms' 24-inch theodolite was 38, fixing ten new principal stations, arranged so as to form two hexagonal figures, which covered an area of 408 square miles.

The operations of this season were mainly confined to the tract of country, known as the Cauvery delta, which consists of an even plain of alluvial deposit, containing a comparatively large proportion of sand, and having a good slope of 3 or 4 feet per mile. According to the levels of the South India Railway the bed of the Cauvery from Karúr to within 30 miles of the coast has a pretty even fall of near 4 feet a mile; in the next 10 miles the gradient decreases to about 3 feet a mile, and in the vicinity of the coast it does not exceed 2 feet a mile. Continuing this examination of the declivity by means of the Government Marine charts, the fall out at sea increases in the first 14 miles to 5 or 6 feet per mile, to 8 or 9 feet per mile for the next 9 miles, to 24 feet for the next 6, and to 38 feet for the last 10 examined up to 37 miles from the coast. This rapid deepening of the sea is a noticeable fact, but it seems only natural, if the present coast-line is of purely fluviatile formation. The character of the alluvium alters and generally deteriorates in fertility as the distance from the head sluices of the Cauvery channels increases. It varies from a rich red or black loam to a pale sandy clay, the sand increasing and the clay diminishing from west to east, and but for the annual fertilizing floods would be anything but rich and productive. Without artificial manure the land usually bears but one crop yearly.

The sea-board flats are well raised above sea-level, and further protected from high tides and storm-waves by a high sand-ridge along the coast. Cyclones have been frequent, but have never made any great devastating inroad. The formation of this coast-ridge appears to be explained by the strong sea breezes which prevail in the hot and dry season, and, blowing strongest at the hottest part of the day, when the sand of the sea-beach is driest and most easily raised, continually drift it up inland to accumulate under the shelter of the coast vegetation. It is thus formed into a ridge, or line of hillocks, parallel to the shore-line at the inner and upper edge of the beach, frequently standing at a steep slope on both seaward and landward sides. The sand-drift does not appear to extend far inland, being kept down by the fringe of palms and other vegetation that usually grows near the coast. This advanced vegetation equally protects the sand-ridge from being blown out to sea in the violent winds of the south-west monsoon.

As to whether the coast-line of the Cauvery delta is altering, it may be well to consider the elements of change at work. The first to be noticed are the silt-bearing floods of the autumnal rains, which are doubtless yearly raising the level of the land generally and tending to make it encroach on the sea, extending the coast-line eastwards and shoaling the sea-bed, a slow but unceasing process, which may wax and wane and seem even sometimes to contradict the effects which must inevitably occur sooner or later. The process of new land-formation may be much slower now than it was before the great irrigation works were begun, but so long as fresh silt is brought down by the annual floods, it cannot cease altogether. The heavier sand is dropped first as the current slackens, while the lighter is carried on till the river current is lost in the quiet depths of the open sea.

The next element of change is the wind, which acts both directly and indirectly, and in various ways. First there is the north-east monsoon, acting indirectly by means of the southward, 'long-shore current which carries the silt-bearing floods more or less down the coast and causes them to deposit their heaviest burden to the south of the river outlets, thus commencing the sand-banks, which help to shift the river mouth northwards. This wind cannot act directly on the shore sand to the north of the river mouths, because the sand is then moist by the recent autumnal rains, the heaviest rain of the year. But the southward set of the rollers and beat of the surf must tend to drift the shore-sand, loosened by its violence, southward across the river mouths, which it shoals, helping to form the bar of sand-banks and islands usually found in such situations.

In January and February the north-east monsoon gradually changes into land- and sea-breezes, which increase as the spring advances with clear weather and a hotter sun. The sand of the sea-shore rapidly dries and is drifted by the sea-breezes to the top of its slope, as long as there is loose sand to drift and nothing to shelter it. The sea-breezes veer gradually to the south-east and southward until in May they become strong 'long-shore winds from the south, directly transporting northward much of the blown sand collected along the coast-ridge, in clouds which settle in the hollows and tend to fill up and choke the southern edges of the river out-falls and so to shift them northwards.

With the change of wind from the north-east in January to the south-east and south in April and May, the 'long-shore current changes from south to north, latterly running rapidly northwards and bringing in the heavy sea-rollers obliquely to the coast from the south-east, to dash in lines of roaring surf on the shore, washing the sand of the beach northwards at every stroke. This double action drives the river mouths northwards.

Whether this is the right explanation or not, the fact remains that the mouths of the rivers of the Coromandel Coast are continually shifting northwards. This is best seen in the Mahánadi and Cauvery, but is also noticeable in the Pĕnner, Nagari, Kŏrtalayár, Kuam, Pálár and Baigai. It is not so prominent in the Godávari, Bellar and Tamrapani, the first of which has one outlet apparently to the south of its delta, and the Kistna (Krishna) seems to contradict this tendency; but these apparent exceptions probably admit of some explanation. On the west coast the *débouchement* of the Nĕtrávati exhibits a similar tendency to shift to the north; this is probably due to the set of the current, and the violent beat of the breakers during the south-west monsoon which has nothing to counterbalance it. The same tendency of the river mouths to shift northwards may be observed in Ceylon.

After shifting to the north for an indefinite period, during which it seems probable that the bed of the river must be silting up, especially near the outfall where the current is less, some unusually high flood may be expected to top the bank and thus form a new outlet to the south. This may possibly occur near the head of the delta, and the new channel may take its course along the southern edge or border and recommence the process of shifting its mouth northward again. This may be the explanation of the Kistna apparently flowing along the southern border of its delta; it also points to a possibility of the Cauvery doing the same thing some day.

When a river has opened a new mouth and abandoned the whole or a portion of its course, especially that which ran parallel to the coast, it seems only likely that a lagoon or back-water will be formed, which will sooner or later silt up and eventually be entirely reclaimed from the sea.

Having thus considered the causes of the northward shifting of the river mouths on the Coromandel Coast, to which the Cauvery has been subject continually during the formation of its delta to the east of Trichinopoly, the probable history of its more recent inland course offers itself for consideration.

Dr. Burnell of the Madras Civil Service states, he has met with no mention of the Coleroon, which is now the principal bed of the lower Cauvery, by the early geographers, and thinks that the channel which passes by Kumbakonam and Máyavaram and enters the sea at Káveripatnam having retained the name of Cauvery throughout its course, was the main channel of the river till the 10th or 12th century.

From Ptolemy's map of the coast of India it would appear that 2,000 years ago there was a spit of land jutting out into the sea at the Cauvery mouth near "Chabin's Emporium" (Káveripatnam), of which there is now no trace, either above or below the sea-level contour line. Such a spit or shoal would, however, naturally disappear, if the river mouth shifted, or if any thing stopped the deposition of silt which formed it; and this must have happened, when the great irrigation works at the head of the delta were constructed.

At present the Káveripatnam mouth of the Cauvery is nearly silted up, and the principal outlet of the surplus flood-water is now by the mouth of the Coleroon, where according to recent maps, a new deltaic projection and shoal are forming. The great irrigation works are supposed to have been constructed in the 10th and 12th centuries, but local traditions represent them as early as the year 200 A.D. In any case the delta has been under irrigation from time immemorial. The story of the Cauvery main channel would seem to be somewhat thus:—After some long period of silting up from the deposit left by the annual floods, the river in some unusual inundation must have overflowed its banks, and found a new and easier course.

Season 1878-79.

PERSONNEL.

Lt.-Colonel B. R. Branfill, Dy. Supt., 2nd Grade.
Mr. G. Belcham, Surveyor, 4th Grade.
" C. D. Potter, Asst. Surveyor 1st Grade.
" A. H. Bryson, " " 3rd "

The survey operations in this district were resumed in November, 1878, at the Coleroon river, a few miles north of Kumbakonam in Tanjore, where the work of the preceding season had been concluded. Passing through the north-east corner of the Trichinopoly district, the principal series traversed South Arcot, running parallel to the coast-line at a distance of 15 to 35 miles inland through a country hitherto devoid of trigonometrically fixed points. During the field season the direct distance spanned by the principal series was 77 miles, and the area covered by triangulation was 1,887 square miles. 17 principal stations were fixed, and 1,900 square miles in advance were reconnoitred for the triangulation remaining to complete the series. Two azimuths of verification were observed.

The country actually operated over lay in the alluvial flats of the Coleroon, Bellar and South Pĕnner rivers, and the upland plateaux between them. One of these plateaux presented an undulatory surface covered with low bush and devoid of any prominent elevations; it was very difficult to traverse and necessitated a long and careful examination before a system of mutually visible points could be discovered suitable for stations of the great triangulation.

Season 1879-80.

PERSONNEL.

Lt.-Colonel B. R. Branfill, Dy. Supt., 2nd Grade.
Mr. C. D. Potter, Assistant Surveyor 1st "
" A. H. Bryson, " " 3rd "

In the following season, 1879-80, the South-East Coast Series was completed. The closing operations lay in the plain of the Carnatic (Karnatik), which, being studded with hillocks and mounds of rock, was eminently favourable for the triangulation. Lieut.-Colonel Branfill commenced the final observations with the 24-inch theodolite at Kaniyanúr on the 5th of December, and continued without interruption, except the long round-about marches obliged by want of roads and two or three bouts of rainy weather, until the work was finished at St. Thomas's Mount, the fifteenth station visited, on the 26th of February. In the interval he had fixed 13 new principal stations, and closed upon two other previously fixed stations, Mávandúr and Malaipedu, which appertain now to the Madras Longitudinal Series. Two sets of observations for azimuth were taken at Injambákam and St. Thomas's Mount Stations.

The greater part of the districts of the south-east coast of India was taken charge of by the British Government in 1836, and since then the land has undergone but few changes owing to the great regulating works that have been constructed for keeping the floods under control. Near the coast and more especially at Point Calimere (Kalimiyar Munai), there are extensive salt-swamps with patches of jungle and desert. The Kudikarai salt-marsh covers nearly 100 square miles, being about 20 miles long east and west and 5 miles wide north and south. It is used as a vast salt-pan under Government supervision. The two highest spring tides of May and June (called by the natives 'Chittrai Parvam' 'full-moon of May' and 'Visakha Bellam' 'June flood') overflow the sea-wall and fill the swamp with brine, which is, in favourable seasons, soon crystallized under the evaporation from the sun and the dry west winds. The south-east and southerly breezes that prevail in May probably combine to make the spring tides of this season unusually high.

A considerable degree of sanctity is locally attributed to Vedáranyam (veda-forest) and to Kudikarai (promontory-shore) from a tradition that here, as subsequently at the Rámesvaram promontory, the mythic hero Ráma tried to make a causeway to Ceylon. There is now daily postal communication by open boat between India and Ceylon at this place.

An impression exists that Palk's Bay is silting up, but this process must be exceedingly slow, as no large rivers now discharge any great proportion of their silt into this receptacle. The Vegavati outlet scarcely ever discharges, and as more irrigation works are introduced, the proportion diminishes. Still this is to a great extent an inland sea surrounded by a sandy shore from which the land-breezes and strong southerly and westerly winds must bear some drift to deposit. Moreover the northward beat of the surf along the north-east coast of Ceylon from April to September, and the southward beat along the east coast of Tanjore from November to January, must tend more or less to shoal the entrance to Palk's Bay from the Bay of Bengal.

This sea was known to the old Geographers as *Sinus Argaricus*, or, according to Colonel Yule's map of ancient India, as *Sinus Argalicus*. The early Arabian voyagers called it '*ma abar*' *i.e.*, the ford, ferry, or passage, and thence the country beyond, now known as Malabar, received its name.

It is an interesting question, whether the line of sand-banks and islets forming Adam's Bridge, between Rámesvaram and Manár, is undergoing any permanent change. There exist traditions, that at one time it was possible to walk across at low-water dry-shod, but this does not seem to have occurred within modern historic times. On the other hand it appears that there was a considerable trade carried on between Arabia and China through these straits, and one can hardly suppose that it could have been done in such small vessels as can have alone passed through the passages in Adam's Bridge previous to the excavation of the Pámban channel by the British Government, unless there were passages that have silted up since. In a Portuguese manuscript of 1685, by a Captain Ribeiro, which Colonel Branfill believes to be reliable, it is stated that there was then "no passage, except two narrow "canals, one by Ramanacor and the other by Manaor", and that "a small 'sumaca' only can "pass by either at high-water."

At the present time there is a single channel at Manár answering this description, and none elsewhere, except the new passage at Pámban, which has been cut artificially through the rocky reef at a place where, in quite recent times, the old stone causeway had been breached by storm-waves, which also destroyed the adjacent town on the spit of land west of Pámban between Toniturai and Bettilai Mandapam. The surf beats heavily along Adam's Bridge during both monsoons, and a strong current sets constantly the same way as the wind; at other times the current varies with the tide, and one would suppose that no sand-banks could withstand the violence of the wash over them at every change of tide. Still the islets and sand-banks do remain as a whole, albeit probably in a state of frequent change individually. The growth of coral is active here, and new islets are said to be forming where there were none, and old ones increasing.

Tanjore appears to have been occupied from very early times by Tamil people, over whom the Cholan or Soran dynasty held sway for many centuries prior to the 16th, and whose country was known as the "Choramandalam" (Coromandel). The Cholan capital was at different times at Conjeeveram (Kánchívaram), Uraiyúr near Trichinopoly, Tanjore and Kumbakonam. The Telugu Nayaks succeeded the Cholan kingdom and ruled in Tanjore for more than a century up to 1675, when the Mahratta princes superseded them, and reigned there until they were themselves superseded by the British Government.

Secondary Triangulation.

South of the parallel 10° 30′ but few secondary points or land-marks could be fixed owing to the flat and wooded state of the country; in a few cases ray-traces had to be carried between contiguous principal stations, and whilst these were being executed, observations were taken to all visible points in the vicinity that might be useful hereafter for topographical purposes.

In the field season of 1876-77 a considerable number of masonry buildings, chiefly temples, were fixed by a theodolite and chain traverse to serve as points from which the position of the principal stations could be recovered in case the pillar and mark-stones above ground should at any time have been removed; these points being known would also be useful in any future survey of the country, as they were buildings likely to endure for a considerable time.

In 1877-78 the plain of Tanjore was reached, which was known to have been triangulated by Colonel Lambton in the year 1800. The country was not so thickly wooded and therefore more suitable for secondary work, than it had been to the south, and several points were fixed, including the great pagoda at the town of Tanjore. Unfortunately, though this very place had formed one of Lambton's principal stations, and a base-line had been measured in its vicinity, the original mark could not be found, and Tanjore was thus useless as a connection between the ancient and modern survey.

In the two following years a great deal of secondary work was carried out, the country becoming more open after the Coleroon river had been crossed. The original design of making the series follow the trend of the coast being abandoned, the principal work was carried between the old Coromandel Coast Triangulation and the more general net-work to the westward (shewn on Colonel Lambton's chart), and thus several points of this old triangulation were able to be connected on either side by secondary work. Moreover a tract of country previously devoid of fixed points was now well covered and a great gap was filled up, which had baffled the efforts of the earlier Surveyors.

The coast-town of Porto Novo on the eastern flank, and the two hill stations of Tiyága Drug and Tiruvannámalai on the western, were observed and fixed from principal stations; but the positions of the light-houses of Pondicherry and Negapatam were too far away from the main series to be thus determined, and secondary chains had to be carried westward for the purpose. The work was entrusted to Mr. Potter who first occupied himself with the Pondicherry connection. This he found a matter of no difficulty necessitating only the introduction of three secondary points. He then moved on without delay to the larger and more important work of laying out the minor series to Negapatam. Kumbakonam–Álangudi was chosen as the side of origin, and a chain of eight single triangles was required to complete the connection. This series passed over a thickly-wooded country and could not have been executed at a moderate cost, had it not been that there were lofty temples—commonly called gopurams—in some of the intermediate villages, from the summits of which mutual observations could be taken. These temples are tall, ricketty brick structures, consisting of an oblong basement, usually of stone, pierced for the gateway, surmounted by a pyramidal spire of many storeys tapering up to a narrow ridge and profusely covered with stucco ornaments. They are seldom or never used except by bats and vermin, and the many floors and stages within them have been allowed to fall in, so that access to the summit is dangerous, and when attained, is quite unsuited to observe from with a theodolite. Mr. Potter overcame these difficulties by means of temporary staging, long ladders, and a portable striding platform, which he devised and carried with him, and with which he was able to set up the 8-inch theodolite on seven gopurams and thus complete the series.

By means of this minor triangulation three points were fixed in Negapatam, and four others on the coast to the north, including the spire of the Roman Catholic Church at Kárikal. By observations from three stations on the north of the series the position of the Máyavaram gopuram was also determined.

S. G. BURRARD.

July, 1885.

Addendum to Introduction.

On the completion of the Simultaneous Reduction of the Southern Trigon it was found that the errors which had actually been dispersed over the South-East Coast Series, between the origin Mávandúr–Avirimodu and the terminus Koilpati–Kulayanallúr, were as follows:—

		"
In	Latitude of Koilpati	+ 0·174
„	Longitude „	− 0·472
„	Azimuth of latter side	+ 8·882
„	Side { Logarithm of latter side	+ 0·000,0042,3
	giving a ratio of about 0·62 of an inch per mile.	

The trigonometrical heights above sea level are checked at sixteen stations by Spirit-levelling operations, the average correction applied to each section being 1·4 feet.

The Ceylon Branch Series forms a pendant to the South–East Coast Series and therefore did not enter the general reduction. The corrections which it has received in latitude, longitude, azimuth and side are only such as are due to the change produced by the reduction in the side of origin, *viz.*, Kánjarangudi–Yervádi. The trigonometrical heights above sea level are checked at three stations by Spirit-levelling operations, and at four stations by noting the level of the sea at certain times for at least two days at each station while the trigonometrical operations were in progress, the average correction applied to each section being 1·3 feet.

December, 1887. W. H. C.

SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. ALPHABETICAL LIST OF STATIONS.

Álangudi	XXVI.
Annapúnáyakanpati	LXVIII.
Arapoth	LXII.
Arasapat	XXVIII.
Avirimodu (of the Madras Longitudinal Series).	XXXIX.
Ayyampet	XVI.
Chĕndamangalam	VIII.
Gingee	V.
Kachipĕrumál	XX.
Kadaládi	LXIII.
Kàkkrákota	XXXII.
Kallakota	XXXV.
Kallapat	VI.
Kalúrunikád	XXXVI.
Kánád	XLIV.
Kánádakŏndán	XIV.
Kaniyanúr	II.
Kánjarangudi	LIX.
Kárakkurchi	XXXVII.
Kidátirukai	LXV.
Kiliyúr	IX.
Kŏdikulam	LIII.
Koilánkuppam	XII.
Koilpati (of the Great Arc Meridional Series, Section 8° to 18°).	LXXXIII.
Kuchúr	XVIII.
Kulamangalam	XL.
Kulattúr	XIX.
Kulayanallúr (of the Great Arc Meridional Series, Section 8° to 18°).	LXXXV.
Kumbakonam	XXIII.
Mallipat	VII.
Manĕgandi	XLVIII.
Manikamkota	XLVII.
Mánúr	XLI.
Mávandúr (of the Madras Longitudinal Series).	XXXIV.
Melakalúruni	LXXII.
Merpanaikád	XXXVIII.
Mínákshi	LXXIV.
Mŏtúruni	LXXI.
Mutupatnam	LII.
Mutúruni	LXX.
Mutuváncheri	XXV.
Nambudalai	XLIX.
Narasingapuram	III.
Náyanárkoil	LV.
Nayinipiriyán	XXII.
Ŏkkúr	XLIII.
Ŏpilán	LXIV.
Pallathivayal	XLII.
Parutikota	XXIX.
Pátharankota	XXXIII.
Patukota	XXXIV.
Pĕrumukkal	IV.
Pŏdaiyúr	XV.
Pŏnnúr	I.

PRINCIPAL TRIANGULATION. ALPHABETICAL LIST OF STATIONS—(*Continued*).

Pŏragudi	LIV.
Pulápati	LXVII.
Putagaram	XXIV.
Púvatúr	XXXI.
Ramnad	LVI.
Rárámutiraikota	XXX.
Rĕtavayal	XXXIX.
Salpai	XVII.
Sambuttiyendal	LVII.
Sembalavayal	XLV.
Seppalánattam	XIII.
Sirukambúr	XLVI.
Supalápuram	LXXIII.
Súrangudi	LXIX.
Tanichanthai	LXI.
Taraigudi	LXVI.
Tirupanandál Mandap	XXI.
Ulundúrpet	XI.
Úrannankudi	LI.
Uttarakoshamangai	LVIII.
Vallam	X.
Vĕnniyúr	L.
Víramangalam	XXVII.
Yervádi	LX.

CEYLON BRANCH SERIES.

Ámanakamunai	LXXXVIII.
Appa Tívu	LXXVI.
Gandhamána	LXXXIII.
Kachi Tívu, N.	LXXXVI.
Kachi Tívu, S.	LXXXVII.
Marakayárpatnam	LXXXI.
Masánam Karai	LXXXV.
Musal Tívu	LXXX.
Pĕriyapatnam	LXXVII.
Pisásu Mundal	LXXXIV.
Púmurichán	LXXXII.
Púvarasanhalli Tívu	LXXV.
Rámaswámi Madam	LXXIX.
Úrimunai	LXXXIX.
Válai Tívu	LXXVIII.

SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. NUMERICAL LIST OF STATIONS.

XXXIV (of the Madras Longitudinal Series).	Mávandúr.
XXXIX (of the Madras Longitudinal Series).	Avirimodu.
I	Pŏnnúr.
II	Kaniyanúr.
III	Narasingapuram.
IV	Pĕrumukkal.
V	Gingee.
VI	Kallapat.
VII	Mallipat.
VIII	Chĕndamangalam.
IX	Kiliyúr.
X	Vallam.
XI	Ulundúrpet.
XII	Koilánkuppam.
XIII	Seppalánattam.
XIV	Kánádakŏndán.
XV	Pŏdaiyúr.
XVI	Ayyampet.
XVII	Salpai.
XVIII	Kuchúr.
XIX	Kulattúr.
XX	Kachipĕrumál.
XXI	Tirupanandál Mandap.
XXII	Nayinipiriyán.
XXIII	Kumbakonam.
XXIV	Putagaram.
XXV	Mutuváncheri.
XXVI	Álangudi.
XXVII	Víramangalam.
XXVIII	Arasapat.
XXIX	Parutikota.
XXX	Rárámutiraikota.
XXXI	Púvatúr.
XXXII	Kakkrákota.
XXXIII	Pátharankota.
XXXIV	Patukota.
XXXV	Kallakota.
XXXVI	Kalúrunikád.
XXXVII	Kárakkurchi.
XXXVIII	Merpanaikád.
XXXIX	Rĕtavayal.
XL	Kulamangalam.
XLI	Mánúr.
XLII	Pallathivayal.
XLIII	Ŏkkúr.
XLIV	Kánád.
XLV	Sembalavayal.
XLVI	Sirukambúr.
XLVII	Manikamkota.
XLVIII	Manĕgandi.
XLIX	Nambudalai.
L	Vĕnniyúr.
LI	Úrannankudi.
LII	Mutupatnam.
LIII	Kŏdikulam.

PRINCIPAL TRIANGULATION. NUMERICAL LIST OF STATIONS—(*Continued*).

LIV	Pŏragudi.	LXVI	Taraigudi.
LV	Náyanárkoil.	LXVII	Pulápati.
LVI	Ramnad.	LXVIII	Annapúnáyakanpati.
LVII	Sambuttiyendal.	LXIX	Súrangudi.
LVIII	Uttarakoshamangai.	LXX	Mutúruni.
LIX	Kánjarangudi.	LXXI	Mŏtúruni.
LX	Yervádi.	LXXII	Melakalúruni.
LXI	Tanichanthai.	LXXIII	Supalápuram.
LXII	Arapoth.	LXXIV	Mínákshi.
LXIII	Kadaládi.	LXXXIII (of the Great Arc Meridional Series, Section 8° to 18°).	Koilpati.
LXIV	Ŏpilán.	LXXXV (of the Great Arc Meridional Series, Section 8° to 18°).	Kulayanallúr.
LXV	Kidátirukai.		

CEYLON BRANCH SERIES.

LXXV	Púvarasanhalli Tívu.	LXXXIII	Gandhamána.
LXXVI	Appa Tívu.	LXXXIV	Pisásu Mundal.
LXXVII	Pĕriyapatnam.	LXXXV	Masánam Karai.
LXXVIII	Válai Tívu.	LXXXVI	Kachi Tívu, N.
LXXIX	Rámaswámi Madam.	LXXXVII	Kachi Tívu, S.
LXXX	Musal Tívu.	LXXXVIII	Ámanakamunai.
LXXXI	Marakayárpatnam.	LXXXIX	Úrimunai.
LXXXII	Púmurichán.		

SOUTH-EAST COAST SERIES.

DESCRIPTION OF PRINCIPAL STATIONS.

The Principal Stations of the South-East Coast and Ceylon Branch Series are in part situated on hills, high mounds, sand hillocks or sand ridges, and in part in low ground of black cotton soil, in sandy flats, along the coast and on islands; a few are placed on lofty buildings.

The first are of two kinds, those on hills and high mounds consist of solid, circular isolated pillars of masonry, $3\frac{1}{2}$ feet in diameter, surrounded by annular walls of masonry 13 to 18 inches thick, and a platform of earth and stones for the accommodation of the observatory tent. In the centre of the upper surface of the pillar a mark (circle and dot) engraved on stone, is imbedded in the normal of one or two other similar marks previously inserted within the pillar. Those on sand hillocks or sand ridges, where no solid foundation for a pillar could be found, are usually defined by a wooden pile driven deep into the sand, carrying a mark engraved on its summit, whilst the theodolite stand and the observatory tent were supported on other piles similarly driven.

The stations other than hill stations are of various forms. Those named trestle stations from the fact of the theodolite having been supported on a trestle, either $17\frac{1}{2}$ or 24 feet high, during the observations are sometimes small isolated pillars of the same construction as those at hill stations, sometimes they consist of solid or perforated pillars from 7 to 16 feet high built in rectangular blocks surmounting one another, each succeeding block being contracted so as to leave a plinth at its base, the uppermost block being in some cases circular and $3\frac{1}{2}$ feet in diameter: these pillars rest on solid blocks of concrete or masonry forming a firm foundation. When the pillars are perforated two mark-stones are imbedded, the upper in the surface of the foundation about a foot above the ground level to which access is obtained by an aperture on the east side. When the pillars are solid they contain two or more marks one at the surface and the others vertically below. The stations XXXI, XXXII, LIV and LV are of exceptional construction and are fully described.

At stations where a trestle was not used perforated pillars were sometimes built to a height of from 11 to 26 feet for the theodolite to rest on and around them a timber scaffolding was erected for the observatory tent, these are called tower stations.

Stations situated on high buildings need no general description, as they are fully described in all cases.

At all stations where a mark-stone was inserted in the upper surface of the pillar, a small protecting pillar in the form of a frustum of a pyramid, 28 inches square at base, 20 inches at top and $3\frac{1}{2}$ feet high, was built over it having another mark-stone in its surface in the normal of the mark below; at some stations the protecting pillar was built before the observations were taken, *i.e.*, both the theodolite and signal were referred to the mark at the top of the protecting pillar.

On the completion of the observations most of the low pillar stations were covered over with high pyramidal mounds of earth about 16 yards square at base.

The following descriptions have been compiled from those given by the Officers who executed the Series, supplemented in a few instances as regards adjacent villages from the Madras Revenue Survey Maps (scale 1 inch = 1 mile) of the country traversed, and corrected, so far as the local sub-divisions in which the several stations are situated, from the Annual Returns furnished by the district Officers to whose charge the stations are committed. Such reports are wanting for the Chingleput and South Arcot districts. The orthography is in accordance with the official list of names of places in the Madras Presidency, dated 4th November 1879, with this difference that the long *é* is shewn without an accent, in conformity with the rules for spelling names in Northern India, and the short *e* as *ĕ* and *o* is treated in the same manner. Final vowels and those in well-known terminals are unaccented. When a name has acquired a popular spelling, the correct transliteration is given in parenthesis where the name occurs for the first time.

XXXIV.—(*Of the Madras Longitudinal Series*). Mávandúr or Mámandúr Hill Station, lat. 12° 45′, long. 79° 42′—observed at in 1865 and 1880—is situated on the summit and towards the N. extremity of the southern portion of the rocky ridge, about 150 feet high, at the southern end of the artificial bund of the Dúsi Mámandúr (or Chenna Ságaram) tank, and about 7 miles S.S.W. of Conjeeveram (Kánchívaram). It is in the lands of the village of Narsamangalam, taluk Arcot (Árkádu), district North Arcot.

This station was built in 1865 presumably on or near the site of Colonel Lambton's station of "Doosh Maumdoor", but no station mark was found except a pile of stones round the base of an old staff fixed in a crevice of the rock and cut off flush with the surface. A mark was first made on the stump of the staff, and over this was built a solid circular pillar of masonry 3½ feet in diameter carrying a mark engraved on stone imbedded in its upper surface 1·5 feet above the lower mark. The pillar was surrounded by the usual annular wall and platform. When the station was visited in 1880, the circular pillar and its upper mark were found apparently just as left in 1865, and no alteration in its construction was made. The directions and distances of the following villages are:—Mámandúr N.E. by E., miles 1½; Dúsi N.N.E., miles 3; and Narsamangalam S.E., mile ½.

XXXIX.—(*Of the Madras Longitudinal Series*). Avirimodu Hill Station, lat. 12° 27′, long. 79° 57′—observed at in 1880—is situated on the western and highest point of the rocky hill which rises about 340 feet above its base, 4 miles S.S.E. of Madurántakam, and 1½ miles E. of the Chúnámpet road. The station is in the lands of the village of Avirimodu, taluk Madurántakam, district Chingleput (Chĕngalpatu).

The station consists of a platform of stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·6 feet above it on a stone imbedded in the upper surface of the pillar. The azimuths and distances of the following places are:—Avirimodu 45°, mile ½; Ĕndattúr 292°, miles 1½; Chitrávádi 164°, mile ½; Karunguli (a small temple on a hill 2 miles N. of Madurántakam) 166° 22′, miles 5·75; and Tiruvapádi (a rock temple) 85° 39′.

I. Pŏnnúr Hill Station, lat. 12° 30′, long. 79° 34′—observed at in 1879—is situated on one of the highest boulders forming the summit of a small rocky hill which rises about 250 feet above its base, immediately S. of the road to Chetpat, and about 6 miles W. by S. of the taluk town of Wandiwash (Vandavási). It is in the lands of the village of Pŏnnúr, taluk Wandiwash, district North Arcot.

The station consists of a platform of stones and earth, 15 feet by 11 feet, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 3·0 feet above it on a stone imbedded in the upper surface of the pillar. The azimuths and distances of the following places are:—Pŏnnúr 322°, miles 1½; Tirumanitángal 111°, mile 1; Vangaram 287°, miles 1¼; Áráchúr 230°, miles 1½; and Kúttampat (temple W. of the village) 38° 20′, miles 1¼.

II. Kaniyanúr Hill Station, lat. 12° 47′, long. 79° 24′—observed at in 1879—is situated on the S. end of the summit of a rocky hill rising about 150 feet above the adjacent high ground, about 8½ miles S. by E. of the old Arcot town, and 4½ miles S.E. of Timri on the high road from Arcot to Árni. It is in the lands of the village of Kaniyanúr, taluk Arcot, district North Arcot.

The station consists of a platform of stones and earth, 3 feet high, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 3·0 feet above it on a stone imbedded in the upper surface of the pillar. The directions, azimuths and distances of the following places and objects are:—Kaniyanúr 154°, mile 1; Pudúr 267°, mile ¾; Nambitángal S.S.E., mile ½; Chĕmbed (temple) 230° 16′, miles 1¾; Arcot old town (southern of two white minárs) 116° 55′, miles 8½; Arcot old town (southern of two dark minárs) 166° 48′, miles 8½; Trijunction boundary stone pillar at S.E. foot of the hill 302° 40′; and Trijunction boundary stone pillar at E.N.E. foot of the hill 240° 26′.

III. Narasingapuram Hill Station, lat. 12° 31′, long. 79° 19′—observed at in 1879—is situated on the highest part of the rugged hill locally known as Pĕriyamalai which rises some 400 feet above its base, on the high ground between the villages of Narasingapuram and Murugamangalam, nearly 11 miles S. of Árni, and 10 miles E. of Polúr. It is in the lands of the village of Narasingapuram, taluk Polúr, district North Arcot.

The station consists of a platform of stones and earth, 3 feet high, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 3·2 feet above it on a stone imbedded in the upper surface of the pillar. The lower mark a circle and dot, is engraved within a similar mark found cut on a large high boulder. Another old mark of a partly defaced circle and dot was found cut on an adjacent boulder to the N.E., distant 10·8 feet and nearly a foot lower than the new station mark. The azimuths and distances of the following places are:—Narasingapuram 100°, mile ¼; Murugamangalam 275°, mile ½; Ŏthalapádi (temple) 178° 19′, miles 3?; Polúr (N. minaret of a mosque) 86° 16′, miles 10?; and Devikapuram (spire of a conspicuous hill temple) 41° 0′, miles 2·12.

IV. Pĕrumukkal Hill Station, lat. 12° 12′, long. 79° 47′—observed at in March and December 1879—is on the roof over the east and innermost doorway (about 14 feet above the ground level) of the small cubic temple (14·3 by 14·3 by 14·0 feet) attached to the W. side of the great temple built on the last considerable mass of the isolated rocks to the S.E., which stud the great plain of the Carnatic (Karnatik) lying to the S. and S.W. of Madras. The hill consists almost entirely of solid, dark granitic rock surrounded by a profusion of great and small pieces that have separated and fallen from it; the main rock rises to a height of 350 feet above the surrounding fields, and has on it a large stone temple and stone built walls of an old fortress. The station is 29·9 feet west, and 3½ feet higher than the position evidently occupied formerly by the flag-staff on the roof of the great temple which appears to have been the site of Colonel Lambton's survey station "Permacoil" of 1803. On excavating the roof to a depth of about 3 feet, no sign of a station mark was found, a part of a cylindrical stone pillar was set up to mark as nearly as practicable the site of the old flag-staff. It is in the lands of the village of Pĕrumukkal, taluk Tindivanam, district South Arcot.

The station consists of a solid circular pillar of masonry 3½ feet in diameter and contains three mark-stones, the upper on the surface of the pillar and the second and third 2·27 and 4·05 feet respectively below the upper. The azimuths and distances of the following villages are:—Rámanáthapuram 148° 47′, mile 1; Pĕrumukkal (centre of the village temple) 169° 5′, mile 1; Nalmukkal or Naumukkal 246° 46′, miles 1·95; and Nallálam 325°, mile ½. When again visited in December 1879, it is presumed from the absence of any remarks in the original records that the station was found in good order and no alteration was made in its construction.

V. Gingee (Chĕnji) Hill Station, lat. 12° 15′, long. 79° 26′—observed at in 1879—is on the highest part of the famous rock fortress in the plains of the Carnatic, 17 miles W. of Tindivanam: the rock which forms the capitol or citadel of the fortress is a conspicuous and remarkably large single block of gneiss with precipitous sides and rounded summit, rising boldly from amidst the surrounding masses of broken rocks to a height of about 700 feet above the general level of the country. The great rock is generally called Rájagĕdi, but is locally known as Valukupárai, and completely dominates the other associated rocks of the fortress. The station is a little below the floor level in the spacious flat roofed building called Kaváttu Mandapam occupying the eastern part of the terrace or summit of the rock lying between the great vaulted Kalanjiyam (granary) and the old native flag-staff tower to the E.N.E. and near the precipice. It is in the lands of the village of Valukapárai, taluk Tindivanam, district South Arcot.

The station consists of a mark engraved on the rock a little below the floor level, 42·2 feet from the N. wall, 18·6 feet from the W. wall, 23·2 feet from the S. wall, 13·2 feet from the E. wall, and 1·1 feet from the S.E. corner of the south central pier. A low perforated masonry pillar, 3½ feet in diameter, surrounded by a platform 10 feet square, is built on the roof concentric with an old air or smoke hole which permits of plumbing over the mark in the floor: the upper surface of this pillar is 25·7 feet above the mark in the floor. The azimuth and distance of Krishnagĕdi (dome on the summit of the Kacheri) are 231° 12′, mile 0·91.

VI. Kallapat Trestle Station, lat. 11° 57′, long. 79° 36′—observed at in 1879—is situated on the extensive piece of rising ground locally named Jandamodu, 4½ miles E. by N. from Villupuram, 17 miles W. from Pondicherry (Puducheri), 500 yards S.E. by S. from the trijunction boundary stone of Kallapat, Melpádi and Kurumkota villages, and 1½ miles W. by N. of Colonel Lambton's survey station "Chengcaud" on a similar point of rising ground called Kudimodu; its site was identified by a slight mound and a few pieces of broken bricks. It is in the lands of Kallapat village, taluk Villupuram, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one at the ground level and the other 2·17 feet below it. The azimuths and distances of the following places are:—Kallapat 335°, mile 0·84; Melpádi 115°, mile 0·75; Kurumkota 178°, mile 0·51; Chĕnkád 250°, miles 1·50; Naraigúr (temple) 337° 18′, miles 1·5; and Villupuram (Railway station) 77° 39′, miles 4·43.

VII. Mallipat Hill Station, lat. 11° 58′, long. 79° 25′—observed at in 1879—is on the summit of the higher of two isolated rocks rising to a height of 50 feet above its base and locally known as Mallipat Kunnu;

the other rock called Ponnáttakbil from a small shrine on its summit, is 111 yards to the S.E. by E. The station is about 4 miles N. from the S. bank of the Pennar, and within a mile east of the old line of the road from Tiruvĕnanallúr to Gingee. It is in the lands of the village of Mallipat, taluk Villupuram, district South Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter which contains two marks, one engraved on the rock *in sitú* and the other 1·67 feet above it on a stone imbedded in the upper surface of the pillar. The azimuths and distances of the following villages are:—Mámpalapat 11°, mile ½; Káduvĕtti 59°, miles 2; Chĕnnakunnam 98°, miles 2; Mallipat 143°, miles 1·06; and Kánganúr 246°, miles 1¼.

VIII. Chĕndamangalam Trestle Station, lat. 11° 44′, long. 79° 25′—observed at in 1879—is situated on the high and somewhat isolated bluff of red soil and conglomerate forming a prominent eminence on the south bank of the Pŏnniár river, about 1 mile S.W. by S. of the high road from Madras to Trichinopoly (Tiruchinápalli) and Salem (Sĕlam), at the 115th milestone from Madras. The station is built on the highest part of the bluff and only a few yards from the declivity which is steep to the north and west but very gradual to the east and south-east. It is in the lands of Pádúr village, taluk Tirukoilúr, district South Arcot.

The station consists of an earthen platform 3 feet high, enclosing a solid circular and isolated pillar of masonry, built on a foundation of solid masonry, in which three mark-stones are imbedded, one in the surface of the pillar, the second at the ground level 3·0 feet below the upper, and the third in the foundation 2·0 feet below the second. The azimuths and distances of the following places are:—Chĕndamangalam (temple W. of the village) 203°, miles 1·18; Vandipálaiyam (chattram on the high road) 137° 39′, mile 1; Timmarĕddipálaiyam (shaft at the village temple) 276° 28′, miles 1·10; and Tirunámanallúr (centre of the gopuram or spire) 223° 20′, miles 2½.

IX. Kiliyúr Hill Station, lat. 11° 48′, long. 79° 17′—observed at in 1879—is situated on the highest and to the N. E. end of a small group of scattered rocks, which, attaining a height of 75 feet above the base or 100 feet above the more general level of the adjacent ground, lies about a mile to the S. of the village of Kiliyúr and 2 miles W.S.W. from the conspicuous rocky hill of Kunnattúr. It is in the lands of Raghunáthapuram village, taluk Tirukoilúr, district South Arcot.

The station consists of an irregular platform of stones in a retaining wall of brick, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 3·0 feet above it on a stone imbedded in the upper surface of the pillar. The azimuths and distances of the following places are:—Kiliyúr 182°, mile 1; Raghunáthapuram 155°, mile ½; Éllaigrámam 77°, miles 2; Tengunam 36°, miles 1¼; and Naivanai (temple) 11° 52′, miles 2·0.

X. Vallam Trestle Station, lat. 11° 39′, long. 79° 34′—observed at in 1879—is situated near the western end of the stony eminence named Kallumalai, one of the highest points of the elevated ground which extends inland in a W.S.W. direction from Cuddalore (Gúdalúr), between the Gadilam and Paravanár rivers, nearly 2½ miles W. of the high road from Madras to Kumbakonam, at the 119th milestone from Madras, and 8 miles S. by W. of Panruti. It is in the lands of the village of Vallam, taluk Cuddalore, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one at the ground level and the other 1·8 feet below it. The azimuths and distances of the following villages are:—Vallam 100°, miles 1·39; Nadukuppam 139°, miles 1·08; Kilĕkuppam 173°, mile 0·39; and Marangúr 296°, miles 2.

XI. Ulundúrpet Tower Station, lat. 11° 41′, long. 79° 19′—observed at in 1879—is situated on the rising ground 1 mile S.S.E. from the public offices at the head quarters of a Magistrate's sub-division at Ulundúrpet, about midway between the high roads leading from Ulundúrpet to Vriddháchalam and to Salem, each of which passes within half a mile of the station, near the 12th milestone from Vriddháchalam on the former road, and the 123rd milestone (from Madras) on the latter. It is in the lands of Kíránúr village, taluk Tirukoilúr, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 11 feet high, capped with a circular granite slab 38 inches in diameter, having an aperture in the centre and the name Náráyanaswámi engraved on it in Telugu. This pillar stands over a foundation of solid masonry in which two mark-stones are imbedded, one at the ground level and the other 2·0 feet below it. The azimuths and distances of the following places are:—Ulundúrpet (Kacheri building) 206° 22′, miles 1·17; Nĕmili (temple) 353° 6′, mile 0·91; Pillúr 32°, miles 1·71; and Kuppam 127°, miles 1·11.

XII. Koilánkuppam Trestle Station, lat. 11° 37′, long. 79° 27′—observed at in 1879—locally known as Vedakoil, is situated near the western edge of the laterite plateau which runs in a W.S.W. direction from Cuddalore, 25 miles distant; the ground is nearly flat and covered thickly with evergreen bush, and lies between Vriddháchalam and Panruti. The station is about 700 yards E.N.E. of a tank on the W. side of a hamlet called

Mudukuli or Mutukulikulam. It is in the lands of the village of Shemakota, taluk Vriddháchalam, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 7 feet square and 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one in its upper surface at the ground level and the other 2·0 feet below it. The azimuths and distances of the circumjacent places are:—Vedakoil (R.C. Chapel) 64°, mile 0·16; Koilánkuppam 281°, mile 0·97; Manakŏllai 130°, miles 1·52; Irulakurchi 146°, miles 1·85; and Pĕriyakápánkulam 317°, miles 2.

XIII. Seppalánattam Trestle Station, lat. 11° 33′, long. 79° 34′—observed at in 1879—is situated on the high ground called Kallankád between the Yendalodai and Chĕngálodai water-courses, 172 yards S. of milestone No. 24 on the road from Cuddalore to Vriddháchalam, nearly 5 miles W. of Kurinjipádi, 1¾ miles W. of the remarkable building called variously Pardesimadam, Rámalingapillaisálai, &c., and ½ mile N. of the Chĕnkulam or Chĕngáleri tank bund. It is in the lands of the village of Seppalánattam, taluk Vriddháchalam, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one on its upper surface at the ground level and the other 2·1 feet below it. The azimuths and distances of the following villages are:—Seppalánattam 40°, mile 0·58; Puliyanattam 89°, mile 0·77; Múlaikuppam 189°; miles 1·59; and Vadavallúr 269°, miles 1·64.

XIV. Kánádakŏndán Trestle Station, lat. 11° 33′, long. 79° 24′—observed at in 1879—is situated on the high waste land used as a burial ground, about 3 miles N.E. of Vriddháchalam on the Manimukta river, 100 yards E. of the little hollow called Savuriyákulam, and 550 yards N. of a large pond named Udayambarankulam. It is in the lands of the village of Kánádakŏndán, taluk Vriddháchalam, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one at about the ground level and the other 2·6 feet below it. The azimuths and distances of the following places are:—Pavalangudi (centre of the white pointed roof of the temple) 164° 2′; Kánádakŏndán 123°, mile 0·17; Kuppanattam 336°, mile 0·96; Narimadam 262°, miles 1½; and Kopurapuram (centre of the fine gopuram of a temple) 141° 27′, miles 1·19.

XV. Pŏdaiyúr Trestle Station, lat. 11° 21′, long. 79° 33′—observed at in 1879—is situated on rising ground, a dry sandy field called Mutukŏllai, which appears to have been built over in former times, 550 yards S. S. E. from the ruined temple of Valaipuri Ísvaran, and about ½ a mile E. of and nearly midway between milestones 139 and 140 on the high road from Madras to Kumbakonam. It is in the lands of the village of Pŏdaiyúr, taluk Chidambaram, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one in its upper surface at the ground level and the other 1·5 feet below it. The azimuths and distances of the following villages are:—Pŏdaiyúr 212°, mile 0·10; Cholataram 128°, mile 0·75; and Mannárgudi 338°, miles 6·2.

XVI. Ayyampet Trestle Station, lat. 11° 22′, long. 79° 27′—observed at in 1879—is situated on the high ground bordering the Vĕllár valley, on one of the small outlying clearings in the evergreen jungle called Melkáduvettukŏllai and Káchánpallam, about ¾ mile N.W. of the large Roman Catholic (Goa) Church of Ayyampet. The station is 115 yards N.W. and 130 yards N.E. by E. of two boundary pillars which are 191 yards apart. It is in the lands of the village of Ádivarágaṇallúr, taluk Chidambaram, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 11·2 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one at the ground level and the other 2 feet below it. The azimuths and distances of the following villages are:—Ayyampet 316°, mile 0·74; Áthanúr 194°, mile 1; Srímushnam 172°, miles 2½; and Pálaiyamkota 275°, miles 3½.

XVII. Salpai Trestle Station, lat. 11° 15′, long. 79° 29′—observed at in 1879—is situated in the S.E. corner of a field called Nĕllimarakŏllai, midway between the homestead of Pattavarti and the Áyanár temple of Salpai towards the Chattram, ¼ mile S.E. of the junction of the Alliyeri tank bund with that of the Salpai tank, which is a portion of the great Pŏnnerikarai, a channel bank running N. and S. between the Coleroon (Kŏlladam) and the Vĕllár rivers. It is in the lands of the village of Salpai, taluk Udayárpálaiyam, district Trichinopoly.

The station consists of a rectangular perforated pillar of masonry 7 feet square at base and 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one at about the ground level and the other 2·5 feet below it. The azimuths and distances of the following villages are:—Pattavarti

137°, mile 0·14; Salpai 179°, mile 0·66; Anjarámpálaiyam 205°, miles 1·01; Págalmodu 8°, mile 1; and Vĕtiyárpattu 86°, mile 0·93.

XVIII. Kuchúr Trestle Station, lat. 11° 13′, long. 79° 35′—observed at in 1879—is situated on a small mound on the N. edge of the rice fields called Punjaveli, ¼ mile W.S.W. of the village of Kuchúr, and 316 yards in the same direction of the new temple of Lukshminaráyana Pĕrumál between the village and the Melkulam tank. It is in the lands of the village of Kuchúr, taluk Chidambaram, district South Arcot.

The station consists of a rectangular perforated pillar of masonry 7 feet square at base and 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one in its upper surface about 4½ feet above the surrounding rice fields and the other 2·2 feet below it. The azimuths and distances of the circumjacent places are:—Kunnavásal (Ammankoil temple) 352° 22′, mile 1·0; Omámpuliyúr (temple) 297° 32′, mile 0·95; Mannárgudi (centre gopuram of the Pĕrumál temple) 183° 51′, miles 3·78; Kuchúr 231°, mile 0·34; and Áyangudi 64°, mile ½.

XIX. Kulattúr Trestle Station, lat. 11° 17′, long. 79° 23′—observed at in 1878—is situated on the N. edge of the Káchánpallam evergreen jungle and ½ mile S. from the E. end of the Villaipurandáneri tank. It is in the lands of the village of Kulattúr, taluk Udayárpálaiyam, district Trichinopoly.

The station consists of a rectangular perforated pillar of masonry 7 feet square at base and 10 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one in its upper surface 0·5 foot above the ground level and the other 2·27 feet below it. The directions, azimuths and distances of the circumjacent villages are:—Kulattúr 138°, mile 0·54; Devanúr 219°, miles 4½; and Ĕlaiyúr S.S.W., miles 5.

XX. Kachipĕrumál Trestle Station, lat. 11° 12′, long. 79° 21′—observed at in 1879—is situated in the midst of the evergreen jungle, 280 yards S.W. by W. of the nearly obliterated depression in a field called Narikulipálam, and ¾ mile N.N.W. of the village temple of Kachipĕrumál. The station is in the lands of the village of Kachipĕrumál, taluk Udayárpálaiyam, district Trichinopoly.

The station consists of a rectangular perforated pillar of masonry 7 feet square at base and 11 feet high, the upper 1 foot of which is circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one in its upper surface 0·5 foot above the ground level and the other 2·5 feet below it. The azimuths and distances of the circumjacent places are:—Kallimangalam (centre of the dome of the temple) 99° 7′; Udayárpálaiyam (centre of the tower of the zamindár's house) 42° 18′, miles 1·74; Udayárpálaiyam (centre of the chief gopuram or spire) 55° 16′, miles 1·43; Kachipĕrumál 344°, mile 0·73; Ĕlamangalam 182°, mile 0·78; and Ĕlaiyúr 175°, miles 1½.

XXI. Tirupanandál Mandap Station, lat. 11° 6′, long. 79° 30′—observed at in 1878—is on the top of the principal mandap (cupola or dome) of the large Sivan temple. This mandap is 130 yards distant on the northern side of the street running due west from the great gopuram or entrance tower of the temple and on the west side of the high road from Madras to Tanjore (Tanjávúr), exactly opposite milestone No. 158 from Madras, 10 miles N.E. by N. of Kumbakonam, and 3 miles S. of Anaikarai, the Coleroon lower anicut. The station is in the lands of the village of Tirupanandál, taluk Kumbakonam, district Tanjore.

The station is denoted by a mark-stone imbedded on the top of the cupola or dome of the building, after the removal of the finial (or kalasam), very nearly 7 feet higher than the centre of the terrace-roof which is 27·7 feet square and 25 feet above the ground level. The station mark is 21·06 feet from each of the four corners of the roof. The 24-foot trestle was employed for the theodolite. After the observations were completed the finial was restored.

XXII. Nayinipiriyán Trestle Station, lat. 11° 8′, long. 79° 23′—observed at in 1878 and 1879—is situated on a sand ridge or small mound in a field called Mŏtaikŏllai close to the open scrub jungle, about 935 yards N.E. of the village temple, nearly 7 miles W. of Anakarai, the Coleroon lower anicut, 5 miles S.E. of the town of Udayárpálaiyam, and 6 miles S. by W. of Jayankŏndacholapuram, the present head quarters of the taluk. It is in the lands of the village of Nayinipiriyán, taluk Udayárpálaiyam, district Trichinopoly.

The station consists of a rectangular perforated pillar of masonry 7 feet square at base and 10 feet high, the upper portion being circular and 3½ feet in diameter, standing on a foundation of solid masonry in which three mark-stones are imbedded, the upper flush with its surface about 6 inches above the ground level and the second and third 1·0 and 3·4 feet respectively below the upper. When again visited in 1879, the station was found in perfect order and no alteration in its construction was made. The azimuths and distances of the following places are:—Nayinipiriyán (Sivan or Ísvaran temple W. or N.W. of the village) 53°, mile 0·54; Vándrámpatnam (Vimánam of the Sivan temple) 177° 22′, miles 1·84; and Murtiyán (old masonry chattram on the old way from Udayárpálaiyam to Kumbakonam) 345° 18′, miles 1·48.

XXIII. Kumbakonam Station, lat. 10° 58′, long. 79° 25′—observed at in 1878—is on the middle of the flat roof of the square central tower of the Provincial College, built in 1873-74, on the left bank of the

Cauvery (Káveri) and 500 yards E. of the bridge over this river. The station is 10 feet E. of the cupola over the spiral stone stairs. It is in the lands of the village of Pĕrumpándi, taluk Kumbakonam, district Tanjore.

The station consists of a solid circular pillar of brick masonry 3½ feet in diameter and 6 inches high, built on the centre of the terrace-roof which is 44 feet above the floor of the building and 51 feet above the adjacent ground level. The azimuths and distances of the following objects are:—Cauvery bridge (south abutment) 59° 18′, mile 0·31; Karupúr village temple 214° 48′, miles 1·46; Kumbakonam (tower of the Protestant Church, E. of the town) 289° 19′, mile 0·93; Ávúr (temple) 37° 22′, miles 6·2; and Kumbakonam (ridge of the Sárangapáni great temple at the E. entrance of the Vishnu temple) 31° 19′, mile 0·86. The 17½ foot trestle was employed for the theodolite.

XXIV. Putagaram Trestle Station, lat. 10° 57′, long. 79° 32′—observed at in 1878—is situated on the N.W. corner of the small patch of artificially raised ground used for threshing, called Pudukálam, in the midst of extensive rice fields between the Kírtímán and Arasillár rivers or irrigation supply channels, 550 yards E. of the village of Putagaram, 4 miles E.S.E. from Tirunágesvaram, and 7 miles E. of Kumbakonam. It is in the lands of Putagaram village, taluk Kumbakonam, district Tanjore.

The station consists of a rectangular, perforated pillar of masonry 7 feet square at base and 11·2 feet high, the upper portion being circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one in its upper surface (at the threshing ground level, a couple of feet or so above the rice fields) and the other 1·9 feet below it. Three outer rectangular pillars of masonry are built up to the level of the central pillar for the support of the high trestle. The azimuths and distances of objects in the following places are:—Putagaram (point or dome of the Sivan temple) 108° 35′, mile 0·3; Rĕndánkatalai (point or dome of the Sivan temple) 136° 44′, mile 0·67; Tukáchi (temple) 358° 25′, miles 1·06; Tandáulotam (Sivan temple) 83° 6′, miles 1·61; and Ammangudi (Pĕrumál temple) 233° 32′, miles 1·05.

XXV. Mutuváncheri Trestle Station, lat. 11° 2′, long. 79° 19′—observed at in 1878—is situated on the S.S.E. part of the Sáttambádi Sittamalli upland waste covered with gravel and scrub jungle here called Padarkallupottai, half a mile N.E. by N. from the hamlet of Nágapanallúr, and 2 miles N.W. of the Coleroon river. It is in the lands of the village of Mutuváncheri, taluk Udayárpálaiyam, district Trichinopoly.

The station consists of a rectangular perforated pillar of masonry 7 feet square at base and 10 feet high, the upper 1 foot being circular and 3½ feet in diameter, standing on a foundation of solid masonry in which two mark-stones are imbedded, one in its upper surface ½ a foot above the ground level and the other 2·6 feet below it. The azimuths and distances of the following villages and objects are:—Kunjuveli or Nágapanallúr 39°, mile 0·64; Kŏdamangalam (Sivan temple) 57° 39′, miles 1·36; Sáttambádi 300°, miles 1·60; Mutuváncheri 342°, miles 1·31; Strípurandán (temple) 258° 29′, miles 3; Sámimalai (large temple) 323° 53′, miles 7; Tútúr (temple) 14° 13′, miles 3; and Vikramangálam (temple) 100° 38′, miles 3.

XXVI. Álangudi Trestle Station, lat. 10° 50′, long. 79° 27′—observed at in 1878—is situated on the mound called Mŏtaiyántĕdal marking the site of the old village of Tirumanamangalam, half a mile N.W. of the large village of Álangudi and 200 yards W. of the high road from Kumbakonam to Mannárgudi, the former being about 9 miles N. of the station. It is in the lands of the village of Álangudi, taluk Kumbakonam, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter at top which contains six mark-stones, one in its upper surface and five others 2·2, 6·0, 9·0, 10·0, and 11·0 feet respectively below it, the lowest being 1 foot below the ground level. Three outer rectangular pillars of masonry are built up to the level of the central pillar for the support of the high trestle. The directions, azimuths and distances of the following places are:—Álangudi (spire of the Vardarájulu Pĕrumál temple S.W. of the village and near the high road) 316° 15′, mile 0·26; Valangimán village 170°, miles 3·5; Nídámangalam town and Railway Station S. by E., miles 4·5; Álangudi (Pillaiyár temple on the W. side of the high road and W.N.W. of the village) 251° 4′, mile 0·13; and Álangudi (centre of the ornamental ridge of the Káli Amman Pidári temple) 234° 40′, mile 0·15.

XXVII. Víramangalam Trestle Station, lat. 10° 52′, long. 79° 21′—observed at in 1878—is situated 70 yards N. of the Vĕtár river channel, on the Nattam land of Sittálattúr (S.E. end of Víramangalam), 130 yards S. of the south-easternmost house, 7 miles S.W. of Kumbakonam town and 2½ miles E. of Tirukalá-úr bridge on the Pápanásam-Sáliyamangalam road. It is in the lands of the village of Víramangalam, taluk Kumbakonam, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter at top which contains six mark-stones, one in its upper surface and five others 3·0, 6·0, 9·0, 10·0 and 11·1 feet respectively below it, the lowest being 1 foot below the ground level. Three outer rectangular pillars of masonry are built up to the level of the central pillar for the support of the high trestle. The azimuths and distances of the following places are:—Álattúr 87°, mile 0·43; Víramangalam 145°, mile 0·14; Ávúr (temple) 216° 49′, miles 2·19; Eri (Áyanár temple) 171° 48′, mile 0·94; and Uttakád (Pĕrumál temple) 212° 9′, mile 0·80.

XXVIII. Arasapat Trestle Station, lat. 10° 44′, long. 79° 21′—observed at in 1878—is situated on the east side and near the eastern boundary of a large open sandy field called Manakŏllai, 280 yards W. of the Vadavár river channel, ¾ mile N.N.W. of the Public Works Department little lodge at the head-sluice of the

Mannárgudi Vaykál (supply channel), ¼ mile N. of the centre of the Settiyankáleri (tank), 1¾ miles N. of the high road to Mannárgudi, opposite the 13th milestone, and 5 miles S.S.W. from the Ammápet station of the South Indian Railway. It is in the lands of the village of Arasapat, taluk and district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter at top which contains six mark-stones, one in its upper surface and five others 2·8, 6·0, 9·0, 10·0 and 11·0 feet respectively below it, the lowest being 1 foot below the ground level. Three outer rectangular pillars of masonry are built up to the level of the central pillar for the support of the high trestle. The azimuths and distances of the following places are:—Arasapat 68°, mile 0·48; Panaiyakota (S. point of the Vĕlakachi Amman temple) 84°, miles 1·53; Kambaiyanattam 157°, miles 2·03; and Vada-úr (spire of the Pĕrumál temple) 324° 4′, miles 2·35; and Vada-úr (centre pier of the bridge of four arches on the Tanjore-Mannárgudi high road, about 13¼ miles from Tanjore) 340° 22′.

XXIX. Parutikota Trestle Station, lat. 10° 42′, long. 79° 27′—observed at in 1878—is situated in the N.E. corner of a field called Kátán Manikamkŏllai, about 100 yards E. of a sand bank which forms a field boundary running N. and S. across the ridge of comparatively high ground dividing the Pámbanodai and Válamaduvu valleys, nearly half a mile to the N.W. of the Pudueri tank, about 3¼ miles N.W. by W. of Mannárgudi town, and 5½ miles S. of Nídámangalam station of the South Indian Railway. The station is in the lands of the village of Parutikota, taluk Mannárgudi, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter at top which contains six mark-stones, one is its upper surface and five others 3·0, 5·4, 9·0, 10·0 and 11·0 feet respectively below it, the lowest being 1 foot below the ground level. Three outer rectangular pillars of masonry are built for the support of the high trestle. The azimuthn and distances of the following places are:—Parutikota 124°, miles 1·10; Múvánallúr (temple outside and west of the village° 304° 28′, 2930 feet; Mannárgudi (ridge of the temple) 307° 36′, miles 3·17; and Nágalpúudi (Nágantháthaswámi temple) 166) 27′, miles 1·76.

XXX. Rárámutiraikota Trestle Station, lat. 10° 46′, long. 79° 15′—observed at in 1878—is situated in the western field or enclosure called Melaikŏllai or Sĕvakŏllai, about ¼ mile W. of the village centre, and ½ mile E.S.E. of the boundary of Katirinattam. The station is nearly ½ mile S. of the South Indian Railway station, about 5 miles E. from the Tanjore Railway station towards Negapatam (Nágapatnam) and nearly 2 miles S.E. of Mári Ammankoil on the high road from Tanjore to Negapatam, and 5 miles E. by S. of the Tanjore fort. It is in the lands of the village of Rárámutiraikota, taluk and district Tanjore.

The stationconsists of a solid, central and circular pillar of masonry 10 feet high and 3½ feet in diameter at top, built on a foundation 8 feet in diameter, and contains five mark-stones, one in its upper surface and four others 4·7, 9·0, 10·0, and 11·1 feet respectively below it, the last but one being at the ground level. Round this pillar three outer rectangular masonry pillars are built to support the high trestle. The azimuths and distances of the following places are:—Rárámutiraikota (Áyanárkoil temple) 240°, mile 0·49; Katirinattam (Sivankoil temple) 122°, mile 0·47; and Kulichapat 54°, mile 0·76.

XXXI. Púvatúr Trestle Station, lat. 10° 35′, long. 79° 21′—observed at in 1877 and 1878—is situated in a large open plain covered with scrub jungle called Maikankŏllai, about ½ a mile S.W. of the tank called Tirumateri, and 10 miles N. of Patukota. It is in the lands of the village of Púvatúr, taluk and district Tanjore.

The station, as built in 1877, consisted of a solid circular pillar of masonry 3½ feet in diameter—surrounded by an annular wall 18 inches thick—and contained three mark-stones, one in its upper surface, the second 1·13 feet below it at the ground level, and the third 1·03 feet below the second. Over this pillar a rectangular pillar of masonry 3½ feet high was built, carrying a mark-stone in its upper surface. Outside the annular wall three pillars of masonry 8 feet high were built for the support of the high trestle. When again visited in 1878, the station was found perfect and the mark-stone on the rectangular pillar intact; the central circular pillar together with the annular wall and the three outer pillars were then raised to a height of 10 feet above the ground level, enclosing the original rectangular pillar, a central vertical shaft and a horizontal aperture being specially constructed for access to the mark on the rectangular pillar. The azimuths and distances of objects in the following villages are:—Thŏndarapat (⊙ on a stone drain on the N. side of a temple W. of the village) 322° 54′, mile 0·95; Tirumangalamkota (⊙ on a brick at the S.E. corner of the projecting basement of the Pidári temple S.W. of the village) 236° 59′, mile 0·84; Púvatúr (tamarind tree marked with a +, near a temple) 154° 7′, miles 1·32; Pekarumbukota (centre of the dome of the Shevukan Pĕrumál temple) 115° 46′, miles 1·65; and Melavĕlúr (⊙ on a stone drain on the N. side of the Subramanya Swámi temple, the N.W. temple of the group) 40° 1′, mile 0·88.

XXXII. Kakkrákota Trestle Station, lat. 10° 36′, long. 79° 15′—observed at in 1877 and 1878—is situated in the N.E. corner of the field called Rágamvetikád, 266 yards S.E. of the hamlet of Mannanpunjaitop, 3½ miles W.S.W. of the Oruttannád Chattram at Muttammálpuram on the high road from Tanjore to Patukota, and ½ a mile W. or S.W. of the Vĕdapuri-vaykal river bed or watercourse. It is in the lands of the village of Kakkrákota, taluk and district Tanjore.

The station, as built in 1877, consisted of a solid circular pillar of masonry 3½ feet in diameter—standing on a circular foundation 8 feet in diameter and surrounded by an annular wall 18 inches thick—and contained three mark-stones, one in its upper surface, the second 1 foot below it at the ground level, and the third 1·1 feet below the second. Over this pillar a rectangular pillar of masonry 3½ feet high was built carrying a mark-stone in its upper surface. Outside the annular wall three pillars of masonry 8 feet high and 2 feet square were built for the support of the high trestle. When again visited in 1878, the station was found perfect and the mark-stone on the rectangular pillar intact; the central circular pillar together with the annular wall and the three outer pillars were then raised to a height of 10 feet above the ground level, enclosing the original rectangular pillar, a central vertical shaft and a horizontal aperture being specially constructed for access to the mark on the rectangular pillar. A fifth mark is engraved on the masonry of the second circular pillar 9 feet above the mark of 1877 on the rectangular pillar. The azimuths and distances of objects in the surrounding villages are:—Kakkrákota (centre ornament of the Puti Amman temple) 56° 49′, mile 0·92; Nĕduvákota (⊙ on the ledge at base of the S. side of the Kárialagar temple) 244° 52′, miles 1·84; Pinnaiyúr (centre of the top of the highest dome of the Paramunísvara temple) 350° 8′, miles 1·60; Ayankudi (tamarind tree marked with a + in the centre of the village) 185° 20′, miles 1·49; and Karukádipet (tamarind tree marked with a + at the N.W. end of the village) 55° 10′, miles 1·57.

XXXIII. Pátharankota Trestle Station, lat. 10° 28′, long. 79° 15′—observed at in 1877—is situated in a large sandy plain at the S.W. end of the village lands of Kŏllukád, about ¾ of a mile W. of the village. The station is 0·40 of a mile S. of a masonry pillar on the boundary line between Puduviduthi and Kŏllukád villages. It is in the lands of the village of Kŏllukád, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a masonry foundation 1 foot deep and surrounded by an annular wall 18 inches thick: it contains three mark-stones, one in its upper surface, the second 0·90 foot below it at the ground level, and the third 1·14 feet below the second. Outside the annular wall three pillars of masonry 8 feet high are built for the support of the high trestle. The azimuths and distances of objects in the following places are:—Pátharankota (Kanagammál temple in the hamlet of Ananta Gopálpuram) 290° 52′, mile 0·75; Kŏllukád (mango tree marked with a + over the village temple) 291° 16′, mile 0·74; Vĕttuvákota (spire of the Mutu Mári Amman temple) 107° 45′, miles 1·12; and Káya-úr (pinnacle at the S. end of the temple) 337° 25′, miles 3·08.

XXXIV. Patukota Trestle Station, lat. 10° 26′, long. 79° 21′—observed at in 1877—is situated at the extreme E. end of a hamlet in a plantation of young mango trees, about a mile N.W. of the taluk town of Patukota, and about 900 yards W. of the main road from Tanjore to Patukota. It is in the lands of Sánthánkád village, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation 1 foot deep and surrounded by an annular wall 18 inches thick: it contains three mark-stones, one in its upper surface, the second 1·04 feet below it at the ground level, and the third 0·98 foot below the second. Outside the annular wall three pillars of masonry 8 feet high are built for the support of the high trestle. The azimuths and distances of objects in the following villages are:—Patukota (⊙ on the wall of the Mutu Mári Amman temple on the left side of the road from Tanjore to Patukota) 305° 57′, mile 0·73; Patukota (N.W. corner of the Adaikulam Káthán temple on the right side of the road from Tanjore to Patukota) 329° 58′, miles 1·49; Áladikumulai (⊙ on the basement at the S.W. corner of the Mayisolliappan temple) 171° 50′, mile 0·70; Pálamuti (⊙ on the dome of the Subramanya Swámi temple S.W. by W. of the village) 121° 47′, miles 1·54; and Patukota (cross on the dome of the R. C. Church) 323° 16′, miles 1·53.

XXXV. Kallakota Trestle Station, lat. 10° 31′, long. 79° 10′—observed at in 1877—is situated in a large open plain, about ½ a mile N.E. by E. of the large zamindári village of Kallakota and between the villages of Mayilángapati and Maruthangonviduthi, and 290 yards S. of the main road between Patukota and Kallakota. The station is in the lands of Mayilángapati village, taluk Alangudi of the Pudukota Rája's territory, district Trichinopoly.

The station consists of a solid circular pillar of masonry 2 feet high and 3½ feet in diameter, built on a foundation 8 feet square and 1 foot deep and surrounded by an annular wall 18 inches thick: it contains three mark-stones, one in its upper surface, the second a foot lower at the ground level, and the third at the foundation level and a foot below the second. Outside the annular wall three pillars of masonry 8 feet high are built for the support of the high trestle. The azimuths and distances of objects in the following villages are:—Chŏkantĕr (mango tree marked with a + at the N.W. side of the village) 311° 16′, mile 0·29; Mayilángipati (mango tree marked with a + at the N.E. corner of the Toti hamlet) 359° 9′, mile 0·43; Kallakota (centre of the ornament at the E. end gable of the zamindár's house) 97° 41′, miles 1·15; Ambukoil (centre of the gateway of the temple) 28° 41′, miles 1·81; Maruthangonviduthi (tamarind tree marked with a + at the S. side of the village) 162° 58′, mile 0·40; and Válakuttiyántop tope (mango tree marked with a +, in the hamlet of Maruthangonviduthi) 73° 53′, mile 0·28

XXXVI. Kalúrunikád Trestle Station, lat. 10° 20′, long. 79° 15′—observed at in 1877—is situated in the cultivated lands and on the W. side of the village of this name, about 0·6 mile N. by E. of Nádankád, the same distance S. by E. of Náráyankád village, and about ½ a mile S. of Valasakád. It is in the lands of Kalúrunikád village, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 18 inches thick: it contains two mark-stones, one in its upper surface about 1 foot above the ground level and the other 3·83 feet below it. Outside the annular wall three pillars of masonry 8 feet high are built for the support of the high trestle.

The azimuths and distances of objects in the following villages are:—Kalúrunikád (spire of the Kárudaiyár new temple) 1° 28′, mile 0·25; Kŏlatúr (circle and dot on the sill of the doorway of the Subramanya temple on the E. side of the village) 59° 51′, miles 1·09; Tirusitambalam (spire of the highest building in the Puráthana Ísvara temple enclosure) 146° 54′, miles 1·88; and Káyá-úr (pinnacle at the S. end of the temple) 188° 26′, miles 5·96.

XXXVII. Kárakkurchi Trestle Station, lat. 10° 23′, long. 79° 9′—observed at in 1877—is situated in a large open plain covered with scrub jungle, 0·29 mile S. by E. of a large mango tree marked with a + on the S. side of Tĕrkutĕr village. It is in the lands of the village of Kárakkurchi, taluk Alangudi, district Trichinopoly.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 13½ inches thick: it contains two mark-stones, one in its upper surface and the other 0·96 foot below it, at the ground level. Outside the annular wall three pillars of masonry 10 feet high are built for the support of the high trestle. The azimuths and distances of objects in the following villages are:—Chŏkankudiruppu (tamarind tree marked with a +) 21°, mile 0·80; Mukutukŏllai (tamarind tree marked with a +) 327°, mile 0·86; Nalándákŏllai (tamarind tree marked with a +) 305°, miles 1·04; Kílatĕr (⊙ on the W. side of a parapet surrounding the dome of the Vĕtaiyalagar temple) 271° 16′, miles 1·78; and Vadatĕr (⊙ cut on the roof of the Vírappan temple) 127° 58′, miles 1·39.

XXXVIII. Merpanaikád Trestle Station, lat. 10° 15′, long. 79° 9′—observed at in 1877—is situated in an open plain, at the S. W. corner of the large chattram village of Merpanaikád, and 470 feet S.S.E. from a pipal tree at the trijunction of the villages of Merpanaikád, Ayangudi and Nivatháli. It is in the lands of Ayangudi village, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 13½ inches thick: it contains two mark-stones, one in its upper surface and the other 1·06 feet below it at the ground level. Outside the annular wall three pillars of masonry 8 feet high are built for the support of the high trestle. The azimuths and distances of objects in the following villages are;—Merpanaikád (centre of the S.E. minaret of the mosque) 223° 55′, mile 0·68; Nivatháli (centre of the dome of the Mári Amman temple, higher of the two) 62° 21′, miles 1·21; and Válavári (Pillaiyár temple) 28° 18′, miles 2·16.

XXXIX. Rĕtavayal Trestle Station, lat. 10° 13′, long. 79° 15′—observed at in 1877—is situated on waste land E. of the village of this name, 0·65 of a mile from a large iruppai (mowa) maran tree marked with a + over the mud temple called Mári Amman at the S. end of the village, and about 1¼ miles S.W. of Pásala Koili village. It is in the lands of the village of Rudra Sindámani, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 18 inches thick: it contains two mark-stones, one in its upper surface about 1 foot above the ground level and the other 3·83 feet below it. Outside the annular wall three pillars of masonry 6 feet high are built for the support of the high trestle. The azimuths and distances of objects in the following villages are:—Rudra Sindámani (tamarind tree marked with a +) 298°, mile 0·56; Sígankád (jumblum tree marked with a +) 356°, mile 0·72; Vĕlálankád (tamarind tree marked with a +) 22°, mile 0·53; Omathainád (centre of the dome of the Pillaiyár small temple at the S.W. corner of the Sivankoil temple enclosure) 236° 9′, miles 2·32; and Rĕtavayal (Kanayiran Murthi temple on a tank bund at the N. end of the village lands) 152° 38′, miles 1·43.

XL. Kulamangalam Trestle Station, lat. 10° 17′, long. 79° 5′—observed at in 1877—is situated between the S.W. hamlet of Kulamangalam village and the N.E. hamlet of Tirunallúr village, close to the boundary between these two villages, 460 feet N.W. by N. of a mango tree at the most southerly hamlet of Kulamangalam village, and 941 feet S.W. of the most easterly mango tree at the hamlet of Tirunallúr village; each of these trees is marked with a +. It is in the lands of the Kulamangalam village, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 13½ inches thick: it contains two mark-stones, one in its upper surface and the other 0·96 foot below it at the ground level. Outside the annular wall three pillars of masonry 12 feet high are built for the support of the high trestle. The azimuth and distance of Kulamangalam spire of the Pĕrunkára–Mudayár temple are 292° 35′, mile 0·70.

XLI. Mánúr Trestle Station, lat. 10° 7′, long. 79° 9′—observed at in 1877—is situated in a large open plain between the villages of Mánúr and Áladikád, 630 yards S. by E. of a large Aichiamaram tree (marked with a +) at the E. end of the former village, and 678 yards N. by W. of a large tamarind tree (marked with a +) in the latter. It is in the lands of the village of Mánúr, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 18 inches thick: it contains two mark-stones, one in its upper surface about 1 foot above the ground level and the other 3·92 feet below it. Outside the annular wall three pillars of masonry 3½ feet high are built for the support of the high trestle. The azimuths and distances of objects in the following villages are:—Íchankudi (tamarind tree marked with a +) 90°, miles 1·05; Mayivayal (tamarind tree marked with a +) 219°, mile 0·64; and Vĕttanúr (tamarind tree marked with a +) 318°, miles 1·81.

XLII. Pallathivayal Trestle Station, lat. 10° 9′, long. 79° 3′—observed at in 1877—is situated in an open plain between the villages of Virapavayal and Pallathivayal, about 2 miles E.S.E. of the Arantángi fort, and in an almost direct line between a large mango tree at the S.W. corner of Virapavayal village and a large tamarind tree at the N.W. corner of Pallathivayal village, 341 yards from the former and 358 yards from the latter, each of the trees being marked with a +. It is in the lands of the village of Pallathivayal, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 13½ inches thick: it contains two mark-stones, one in its upper surface and the other 0·71 foot below it at the ground level. Outside the annular wall three pillars of masonry 8 feet high are built for the support of the high trestle. The azimuths and distances of objects in the following villages are:—Wamni (temple spire) 68° 46′, mile 0·78; Mínákshi (temple spire) 74° 38′, mile 0·95; Arantángi fort (spire of the Víramákáli Amman temple) 116° 41′, miles 2·07; and Arantángi fort (centre of the gateway tower) 116° 57′, miles 2·05.

XLIII. Ŏkkúr Trestle Station, lat. 10° 1′, long. 79° 3′—observed at in 1877—is situated about 300 yards N.W. of the village of this name, 1¼ miles N.E. by N. of Sitaur village, and 1 mile E.S.E. of Allativayal village. It is in the lands of the village of Ŏkkúr, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 18 inches thick: it contains two mark-stones, one in its upper surface about 1 foot above the ground level and the other 2·67 feet below it. Outside the annular wall three pillars of masonry 8 feet high are built for the support of the high trestle. The azimuths and distances of the following places are:—Ŏkkúr (⊙ cut on the moulding above the plinth on the W. end of the largest temple) 239° 49′, feet 569; Thunjanúr (⊙ cut on the roof of the temple) 3° 57′, miles 1·29; Elunúthimangalam 223°, miles 1·74; Pĕruntámarai 156°, mile 0·13; and Pŏrukudi 94°, miles 1·46.

XLIV. Kánád Trestle Station, lat. 9° 59′, long. 79° 10′—observed at in 1877—is situated 16 yards from the S. bank of a tank, and lies between it and the temple at the most westerly hamlet of Kánád village, and 1 mile S.W. by S. of Andiandal village. It is in the lands of the village of Kánád, taluk Patukota, district Tanjore.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, built on a foundation and surrounded by an annular wall 18 inches thick: it contains two mark-stones, one in its upper surface and the other 1·1 feet below it at the ground level. Outside the annular wall three pillars of masonry 4½ feet high are built for the support of the high trestle. The azimuths and distances of the following places are:—Kánád (centre of the dome at the W. end of the temple) 40° 37′, yards 273; Karnákúr 159°, miles 1·05; Vĕttivayal 350°, mile 0·71; and Thálanúr (centre of the dome at the W. end of the Sitambra Ísvaran temple) 81° 44′, mile 0·93.

XLV. Sembalavayal Trestle Station, lat. 10° 3′, long. 78° 58′—observed at in 1876—is situated in scrub jungle and about ¾ of a mile N.W. of the village so called. It is in the lands of Sembalavayal village, taluk Tirupatúr, district Madura (Madurai).

The station consists of a solid circular pillar of masonry 3½ feet in diameter, surrounded by an annular wall 13½ inches thick: it contains two mark-stones, one in its upper surface and the other 10·8 inches below it at the ground level. Outside the annular wall three pillars of masonry 3 feet high are built for the support of the high trestle. The azimuths and distances of the following places are:—Panankád 237°, mile 0·8; Tiruppuvayal 185°, mile 0·4; Sembalavayal 317°, mile 0·7; and Vittrávayal (centre of the roof of a Sivan temple) 93° 15′, miles 1·22.

XLVI. Sirukambúr Trestle Station, lat. 9° 52′, long. 79° 3′—observed at in 1876—is situated in the bed of a tank, about ½ a mile W. of the village so called, 200 yards W. of the bund near the central E. waste weir, and 3 miles N. W. of the town of Uriúr. The station is in the lands of the village of Sirukambúr, taluk Tiruvadanai, district Madura.

The station consists of a solid circular pillar of masonry 3½ feet in diameter at top, surrounded by an annular wall 17 inches thick: it contains two mark-stones, one in the foundation about the ground level, and the other 1 foot above it in the surface of the pillar. The azimuths and distances of the following places are:—Sitamangalam 63°, mile 0·8; Peramangalam 117°, mile 0·8; Páganúr 162°, miles 1·1; Mailáváli 4°, miles 1·3; and Andauruni (centre of the dome of the Roman Catholic Church) 97° 57′, miles 1·88.

XLVII. Manikamkota Trestle Station, lat. 9° 55′, long. 78° 58′—observed at in 1876—is situated on the S. bank of a stream (Paushi Ár) 0·4 mile S.S.W. of the village of this name, about 2½ miles S.W. of Kanangudi town, and ½ mile S.E. by E. of Khepalai village. It is in the lands of Urunikota village, taluk Tiruvadanai, district Madura.

The station consists of a solid circular pillar of masonry 3½ feet in diameter at top, surrounded by an annular wall 17 inches thick: it contains two mark-stones, one in the foundation about the ground level and the other 1 foot above it in the surface of the pillar. The azimuths and perambulated distances of the following places and objects are:—Pĕrumál Koil (dome of a small temple) 280° 22′, mile 0·64; Kadambúr 249°, mile 0·88; Pariankota 284°, mile 0·64; Urunikota 338°, mile 0·64; Melanai 7°, mile 0·57; masonry bridge (centre of, on the high road from Tŏndi to Madura through Devakota) 42½°, mile 0·33; and Kamachi Ammankoil (centre of a group of images) 103° 2′, mile 0·25.

XLVIII. Manĕgandi Trestle Station, lat. 9° 46′, long. 78° 58′—observed at in 1876—is situated about 200 yards N.N.E. of the village of this name and 200 paces E. of the road which passes ¾ of a mile S. of Tiruvadanai village. It is in the lands of the village of Manĕgandi, taluk Tiruvadanai, district Madura.

The station consists of a solid circular pillar of masonry 3½ feet in diameter at top, surrounded by an annular wall 17 inches thick: it contains two mark-stones, one in the foundation about the ground level and the other 1 foot above it in the surface of the pillar. The azimuths and distances of the following places are:—Tiruvadanai 162°, mile 0·8; Tiruvadamarudúr (temple) 92°, mile ½, and small square masonry temple 295°, mile 0·9.

XLIX. Nambudalai Trestle Station, lat. 9° 44′, long. 79° 3′—observed at in 1876—is situated in a field about ½ a mile N. by W. of the village of Nambudalai and ¾ mile S.E. by E. of Navakudi. It is in the lands of the village of Nambudalai, taluk Tiruvadanai, district Madura.

The station consists of a solid, circular and isolated pillar of masonry 3½ feet in diameter and contains two mark-stones, one in its upper surface and the other 2·91 feet below it in the foundation. The pillar rises 1 foot above the ground level. The azimuths and distances of the following places are:—Tŏndi (mosque flag-staff, near the N. end of the town) 232° 32′, mile 1; Karuparakoil (wooden shaft in the stone basement of a temple) 137° 13′, yards 220; Ísvarankoil (temple) 317° 38′, yards 300; and Mulatagam 71°, miles 1¾.

L. Vĕnniyúr Trestle Station, lat. 9° 49′, long. 78° 51′—observed at in 1876—is situated about 650 yards S.W. of the village of Vĕnniyúr, 7 miles W. of Tiruvadanai, and 3 miles S.E. of Tiruvegampati town. It is in the lands of the village of Vĕnniyúr, taluk Tiruvadanai, district Madura.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, surrounded by an annular wall 17 inches thick: it contains two mark-stones, one in its upper surface about 1 foot above the ground level and the other 1·1 feet below the upper mark. The azimuths and perambulated distances of the following villages and objects are:—Ándaikudi 120°, mile 0·95; Muppúr 296°, mile 0·93; Ponna Karai 300°, mile 0·36; paka bridge on the road from Tŏndi to Madura 297° 6′, mile 0·36; paka bridge (guard stone on the W. side) 39° 45′, mile 0·17; and dome of a tomb near Vĕnniyúr village 227° 21′, mile 0·67.

LI. Úrannankudi Trestle Station, lat. 9° 37′, long. 78° 58′—observed at in 1876—is situated on the S.W. bund 10 feet above the adjacent fields, about 300 yards N.E. of the village of this name, 5miles E. of Rajasingamangalam, and 1·4 miles W. by S. of Kodalúr village. It is in the lands of Úrannankudi village, taluk Tiruvadanai, district Madura.

The station consists of a solid circular pillar of masonry 3½ feet in diameter and surrounded by an annular wall: it contains two mark-stones, one in its upper surface flush with the bund level and the other 3·0 feet below it fixed in the foundation. The azimuths and distances of the following villages and objects are:—Melúruni 125°, miles 1·2; Chitravádi 221°, miles 1·1; Uppúr chattram (centre of the building) 311° 9′, miles 1·20; and Valaivandi Ammankoil (centre of the large square building) 322° 44′, mile 0·32.

LII. Mutupatnam Trestle Station, lat. 9° 40′, long. 75° 51′—observed at in 1876—is situated about 300 yards N. of the village of this name, 0·8 mile N.E. by N. of Senagudi, ½ mile S.E. of the small village of Setĕdal, and 4 miles N.W. of Rajasingamangalam. It is in the lands of the village of Setĕdal, taluk Tiruvadanai, district Madura.

The station consists of a solid circular pillar of masonry 3½ feet in diameter, surrounded by an annular wall 17 inches thick, around which a platform is built: it contains two mark-stones, one in its upper surface and the other in the foundation 1·0 foot below it at the ground level. The azimuths and distances of objects in the following villages are:—Kŏkku-úruni (cross on the E. gable of the R. C. church) 213° 49′, miles 1·85; Suranu temple (centre of images) 90° 4′, mile ¾; and Mutupatnam (cross on the E. gable of the R. C. church) 355° 9′, mile 0·18.

LIII. Kŏdikulam Tower Station, lat. 9° 30′, long. 78° 51′—observed at in 1876—is on the N. bund of a small tank 320 yards E. of the village of this name, 1¼ miles N.N.W. of Kadambúr, 1·1 miles W. of Arsanúr village, and about 9½ miles N. of Ramnad town. It is in the lands of Kŏdikulam village, taluk Ramnad (Rámnáthapuram), district Madura.

The station consists of a perforated pillar of masonry 25·8 feet high, built on a brick foundation 8 feet square, in which two mark-stones are imbedded, one at the bund level and the other 4·5 feet below it. The pillar is built in two rectangular blocks to within 1·8 feet of the top and thereafter circular and 3½ feet in diameter; an aperture on the E. side gives access to the bund level mark. The azimuths and distances of the following places are:—Tanniapulli 129°, mile 0·8; Pŏttuvayal (centre of the dome of a temple) 224° 59′, miles 2·62; Agráram 297°, mile 0·2; and Manjikulam 354°, miles 2·3.

LIV. Pŏragudi Trestle Station, lat. 9° 30′, long. 78° 56′—observed at in 1876—is situated on a sand mound rising about 6 feet above the general level of the country, 300 yards N.E. of the hamlet of this name, and 1½ miles S.S.W. of Shambai village. It is in the lands of the village of Devipatnam, taluk Ramnad, district Madura.

The station consists of a solid rectangular pillar of masonry 5 feet square, having its upper surface flush with the top of the mound, and contains two mark-stones, one in its upper surface and the other 3·9 feet below it. The azimuths and distances of the following places are:—Devipatnam 340°, miles 1·5; Madavanúr 84°, miles 1·4; Mutturagunathapuramkoil (dome of a temple) 236° 29′, mile 0·81; and Áyanárkoil (centre of a group of images) 99° 9′, miles 1·4.

LV. Náyanárkoil Trestle Station, lat. 9° 32′, long. 78° 44′—observed at in 1876—is situated in an open field, about 600 yards S.E. of the town of this name, 1 mile S. by W. of Tavankota, and 1½ miles W. by N. of Anjiamadai. It is in the lands of the village of Náyanárkoil, taluk Ramnad, district Madura.

The station consists of a solid rectangular pillar of masonry 5 feet square, having its upper surface flush with the ground, and contains two mark-stones, one in its upper surface and the other 3·3 feet below it. Outside the annular wall three rectangular pillars 12 feet high are built for the support of the high trestle. The azimuths and distances of the following places are:—Marudúr 169°, yards 280; Akramanji 324°, miles 1·5; and Náyanárkoil (centre of a temple) 126° 40′, mile 0·36.

LVI. Ramnad (Rámnáthapuram) Station, lat. 9° 22′, long. 78° 52′—observed at in 1875 and 1876—is on the superior slope of the parapet wall of the western face and between two embrasures of the S.W. bastion (the only one now standing) of the old brick fort of Ramnad near the entrance to the town and immediately N. of the high road from Madura. The centre of the bastion is occupied by a bungalow. The upper station mark is 27½ feet above the ground level (terreplein). Taluk Ramnad, district Madura.

The station consists of a solid circular pillar of masonry and contains two mark-stones, one imbedded flush with the slope of the parapet and the other 3·1 feet above it. When again visited in 1876, the station was found covered up just as when left in 1875, and evidently untouched in the interval. The azimuths and distances of the following places are:—Shuraukota 175°, mile 1; Ramnad (W. end of Roman Catholic Church) 268° 42′, mile 0·34; Kurichata Ammaukoil 154° 24′, yards 150; and Kariúr 83°, mile ¾.

LVII. Sambuttiyendal or Shámanúr Tower Station, lat. 9° 23′, long. 78° 45′—observed at in 1875 and 1876—is situated in an open field, 385 yards E.S.E. of the hamlet of Sambuttiyendal, and 1¼ miles N.W. by N. of Kawudakudi village. It is in the lands of the village of Tíyanúr, taluk Ramnad, district Madura.

The station consists of a perforated pillar of brick masonry 20·8 feet above ground level and contains two mark-stones, one at the ground level and the other 3·53 feet below it imbedded in the foundation. The pillar is built in two rectangular blocks to within 3 feet of the top, and thereafter circular and 3¼ feet in diameter; an aperture on the E. side gives access to the ground level mark. When again visited in 1876, the station was found in good order and evidently untouched in the interval. The azimuths and distances of the following villages are:—Pŏgalúr 205°, miles 1·2; Tíyanúr 285°, miles 1·3; Shámanúr 32°, miles 1·2; and Puthúr 111°, miles 2.

LVIII. Uttarakoshamangai Station, lat. 9° 19′, long. 78° 47′—observed at in 1875—is on the central masonry pier of the southern staircase of the southern and unfinished gopuram (temple), about 6½ miles S.W. by W. of Ramnad town, 2 miles N. by E. of Kilaneri, and 5·8 miles N.E. by N. of Idambádal. The station mark is about 5 yards S. of the centre of the building, 50 yards S. of the northern and finished gopuram, and about 51 feet above the ground level. It is in the lands of the village of Uttarakoshamangai, taluk Ramnad, district Madura.

The station consists of a low solid pillar in which two marks are fixed, one on a stone in its upper surface and the other on a brick 0·7 foot below it. The azimuths and distances of the following villages are:—Kalari 280°, miles 2; Tĕchnúr 234°, mile ¾; Kŏneri 76°, miles 2¼; and Chĕttiyendal 57°, miles 3¼.

LIX. Kánjarangudi Station, lat. 9° 15′, long. 78° 51′—observed at in 1875—is situated on the highest hillock of loose drift-sand about 50 feet high, 2½ miles S.S.W. of Tirupilani village, and 8 miles S. of Ramnad town. It is in the lands of Kánjarangudi village, taluk Ramnad, district Madura.

The station consists of a long wooden pile driven flush with the summit of the sand hillock, on which a mark is cut, and around which three other wooden piles are similarly driven for the support of the theodolite stand. The azimuths, directions and distances of the following places are:—Kánjarangudi 194°, mile 0·3; Sĕngalanírodai 3°, mile 0·5; Tirupilani Gopuram 201° 32′, miles 2·62; Nájamandal land-mark 290° 10′, miles 1·04; and Kílakarai Roman Catholic Church S.W., miles 2.

LX. Yervádi or Chakilimedu Station, lat. 9° 14′, long. 78° 46′—observed at in 1875—is situated on the highest hillock of loose drift-sand about 40 feet above the plain, 1½ miles E. of Yervádi village, and

3½ miles W. of Kílakarai village. It is in the lands of Máyakulam village, taluk Mutukulatúr, district Madura.

The station consists of a mark-stone imbedded flush with the hill top, around which three long wooden piles are driven into the sand hillock for the support of the theodolite stand. The azimuths and distances of the following places are:—Idambádal 118°, miles 3½; Pilanthai 237°, mile 1; Máyakulam 256°, miles 1½; and Yervádi (mosque) 87° 39′, miles 1·55.

LXI. Tanichanthai Station, lat. 9° 13′, long. 78° 40′—observed at in 1875—is situated on about the western summit of a sand ridge, about 0·6 of a mile N. of Thodai and Tanichanthai villages, and 60 yards W. of the spot pointed out as the site of an old survey station, most probably "Tunnychundy" of Colonel Lambton's secondary triangulation, now called Vellakaramedu. It is in the lands of Tanichanthai village, taluk Mutukulatúr, district Madura.

The station consists of a mark-stone at the ground level (1·5 × 1·5 × 1·0 feet) imbedded in concrete ending below in a cone. This mark is surmounted by a wooden pile having a circle and dot engraved on its summit, 11·3 feet above the ground level mark-stone; the observations were all referred to the upper mark. The azimuths and distances of the following villages and objects are:—Kŏttankulam temple 101° 36′, miles 1·06; Áykkudi 177°, mile ¾; Rájakalpálaiyam (paka house) 159° 38′, miles 1·84; Hikudi (small boundary stone) 178° 40′, feet 150; and Chorakulam (temple) 231° 40, mile 1.

LXII. Arapoth or Uttan Tower Station, lat. 9° 19′, long. 78° 39′—observed at in 1875—is situated on the S.W. part of the tank bund slightly above the surrounding fields and about ½ a mile S.E. of Arapoth or more commonly called Arapur village. It is in the lands of Uttan village, taluk Mutukulatúr, district Madura.

The station consists of a perforated pillar of brick masonry, 24·6 feet above the bund level, which contains two mark-stones, one at the bund level and the other 2·42 feet below it imbedded in the foundation. The pillar is built in three rectangular blocks to within 2 feet of the top, and thereafter circular and 3½ feet in diameter; an aperture on the E. side gives access to the ground level mark. The azimuths and distances of the following places are:—Uttan 315°, yards 370; Tĕri-iruvĕli 262°, mile 1; Arapoth 141°, mile 0·5; Arapoth (temple) 132° 14′, mile 0·73; and Kamachi Ammankoil 103° 32′, mile 0·75.

LXIII. Kadaládi Tower Station, lat. 9° 13′, long. 78° 32′—observed at in 1875—is situated on the eastern tank bund, 10 feet above the level of the surrounding country, and about 50 yards N. of the village of Kadaládi. It is in the lands of the village of Kadaládi, taluk Mutukulatúr, district Madura.

The station consists of a perforated pillar of brick masonry, 20 feet above the bund level, which contains two mark-stones, one at the bund level and the other 3·75 feet below it imbedded in the foundation. The pillar is built in two rectangular blocks to within 3½ feet of the top and thereafter it is circular and 3½ feet in diameter; an aperture on the E. side gives access to the ground level mark. The azimuths and distances of the following places are:—Mangalam 135°, miles 1·2; Appanúr 154°, miles 3; Purasankulam (small stone temple) 200° 52′, mile 0·50; Kadaládi temple 10° 48′, mile 0·18; and Kadaládi white building 63° 6′, mile 0·32.

LXIV. Ŏpilán Station, lat. 9° 8′, long. 78° 34′—observed at in 1875—is situated on the highest hillock of loose drift-sand 30 feet high, 220 yards from the sea coast, and about 1 mile E.S.E. of Ŏpilán village. It is in the lands of Ŏpilán village, taluk Mutukulatúr, district Madura.

The station consists of a long wooden pile driven flush with the summit of the sand hillock on which a mark is cut, and around which three other wooden piles are similarly driven for the support of the theodolite stand. The azimuths and distances of the following places are:—Ŏpilán (paka house) 110° 51′, mile 0·96; Pĕriyakulam 181°, miles 1½; Tulukapati 245°, mile 1; Koil Máriur temple 257° 8′, miles 2½; and Múkkaiyúr R. C. Church (W. end) 79° 22′, miles 2·68.

LXV. Kidátirukai Tower Station, lat. 9° 18′, long. 78° 30′—observed at in 1875—is situated on a somewhat higher ground than the surrounding country, which is said to be the site of an old fort and about 260 yards N.W. of the village of Kidátirukai. It is in the lands of the village of Kidátirukai, taluk Mutukulatúr, district Madura.

The station consists of a perforated pillar of masonry 17 feet high, built on a concrete foundation 8 feet square, in which two mark-stones are imbedded, one at the ground level and the other 3·08 feet below it. The pillar is built in two rectangular blocks to within 2½ feet of the top and thereafter it is circular and 3½ feet in diameter; an aperture on the E. side gives access to the ground level mark. The azimuths and distances of the following places are:—Appanúr 334°, miles 3; Nĕrinijipati 87°, miles 2¼; Kŏttulavi 166°, mile ½; and Sonapĕrián Kota Pati (small white temple) 170° 47′, mile 0·85.

LXVI. Taraigudi Station, lat. 9° 9′, long. 78° 26′—observed at in 1875—is situated on the eastern summit of a red sand ridge rising 25 to 30 feet above the adjacent plain; the high road from Tuticorin (Tutugudi) to Ramnad passes by the northern side of the ridge. It is in the lands of Taraigudi village, taluk Kamuti, district Madura.

The station consists of a long wooden pile driven flush with the sand ridge on which a mark is cut, and around which three other wooden piles are similarly driven for the support of the theodolite stand. The station is said to occupy the same site as that of "Turraygoody" secondary station of Colonel Lambton's triangulation. The directions, azimuths and distances of the following places are:—Sĕvalpati W.S.W., miles 3½; Kŏkkádi N., miles 2¼; Vĕpaukulam 139°, miles 3½; Umiamálkoil (white building) 99° 58′, mile 1; Muturamalingampuram (masonry building) 74° 42′, miles 3; and Taraigudi (large village) 134°, mile 0·8.

LXVII. Pulápati Tower Station, lat. 9° 14′, long. 78° 25′—observed at in 1875—is situated on a somewhat higher ground than the general level of the country, 1·3 miles E. of Pothampalli, and 1 mile N.E. of Kadamangalam. It is in the lands of Pulápati village, taluk Kamuti, district Madura.

The station consists of a perforated pillar of masonry 21 feet high, built on a concrete foundation 8 feet square, in which two mark-stones are imbedded, one at the ground level and the other 3·92 feet below it. The pillar is built in three rectangular blocks up to a height of 20 feet, and thereafter circular and 3½ feet in diameter; an aperture on the E. side gives access to the ground level mark. The azimuths and distances of the following places are:—Kadamangalam Roman Catholic Church (W. end) 24° 36′, miles 1·38; Ariyamangalam 191°, miles 2½; Pulápati 125°, mile 0·24; Kuthankulam 209°, miles 1½; and Kalutharpán 167°, miles 1½.

LXVIII. Annapúnáyakanpati Tower Station, lat. 9° 12′, long. 78° 20′—observed at in 1875—is situated in an open field of black cotton soil, nearly 1 mile N. of the village so called, 3 miles W. of Tirumáluganthankota, and 3½ miles S.W. of the kasba town of Pernali. It is in the lands of the village of Tirumáluganthankota, taluk Kamuti, district Madura.

The station consists of a perforated pillar of brick masonry, 19·6 feet above the ground level, built on a concrete foundation 8 feet square, in which three mark-stones are imbedded, one at the ground level and two others 1·75 and 3·75 feet respectively below it. The pillar is built in three rectangular blocks up to a height of 18 feet, and thereafter circular and 3½ feet in diameter; an aperture on the eastern side gives access to the ground level mark. The azimuths and distances of the following places are:—Annapúnáyakanpati 11°, mile 0·9; Lachmipuram 25°, miles 1·6; Melasarapuram 93°, miles 1·7; Puthupati 135°, miles 1¾; small boundary stone between Melasarapuram and Tirumáluganthankota 144° 3′, mile 0·79; and large boundary stone near Melasarapuram dividing the Ramnad and Tinnevelly (Tirunĕlveli) districts 101° 52′, miles 1·74.

LXIX. Súrangudi Station, lat. 9° 6′, long. 78° 22′—observed at in 1875—is situated on one of the highest and most westerly points of an extensive red sand ridge, rising about 30 feet above the level of the surrounding country, about 3 miles from the sea coast, and about ½ mile S.E. of Súrangudi village. The high road from Tuticorin to Ramnad passes by the northern side of the ridge about ½ a mile N. of the station. It is in the lands of Súrangudi village, taluk Ŏtapidáram, district Tinnevelly.

The station consists of a long wooden pile driven well into the sand on which a mark is cut, and around which three other wooden piles are similarly driven for the support of the theodolite stand; the station is about 9 feet above the general level of the hill. The directions, azimuths and distances of the following places and objects are:—Melmánthai (large tree) 44°, miles 3; Vĕmbár (centre of a dark building) 294° 22′, miles 3; Tattaneri W. by S., miles 4½; Sĕvalpati N.E. by N., miles 3; and Vĕmbár Roman Catholic Church (spire at the W. end) 297° 47′, miles 2·98.

LXX. Mutúruni Station, lat. 9° 17′, long. 78° 19′—observed at in 1875—is situated on the southern bund of a tank in the open fields, on the boundary of the Ramnad zamindári estate, 3½ miles S. of Paraláchi village, 3 miles S.S.W. of the Shenkulam white building, and 3 miles S.W. by W. of Pulankád. It is in the lands of Paraláchi village, taluk Tirushuli, district Madura.

The station consists of the usual earthen platform enclosing a solid, circular and isolated pillar of masonry 7·13 feet high, built on a deep concrete foundation, in which three mark-stones are imbedded, one at its surface and two others 3·00 and 7·13 feet respectively below it. The azimuths and distances of the following places and objects are:—Paraláchi (temple on the N.E. side of the village) 189° 20′, miles 3·14; Púvanáyakanpati 62°, miles 2½; Tuttinattam 326°, miles 2; Boundary stone A 101° 9′, feet 76; Boundary stone B 271° 11′, feet 401; Boundary stone C 303° 46′, feet 433; Boundary stone D (great upright boundary stone of the Ramnad estate) 324° 18′, mile 0·66; Boundary stone E 62° 40′, feet 102; and Boundary stone F (at the S.W. corner of a tank) 110° 20′, feet 328.

LXXI. Mŏtúruni or Kammápati Station, lat. 9° 9′, long. 78° 14′—observed at in 1875—is on the bund of a tank about ¾ of a mile E. of the village of Kammápati and 1½ miles N.N.E. of Vilátikulam. It is in the lands of the village of Kammápati, taluk Otapidáram, district Tinnevelly.

The station consists of a platform of earth and stones 16 feet square enclosing a solid, circular and isolated pillar of masonry, built on a bed of concrete 9 feet in diameter. The lower 6½ feet of the pillar is built of rough stone masonry and the upper 9¾ feet of brick masonry. The pillar which rises 7 or 8 feet above the bund level or about 15 feet above the general level of the adjacent fields, contains four mark-stones, one at top and the others at 4·75, 9·83 and 16·25 feet respectively below it. The azimuths and distances of the following places are:—Kammápati 94°, mile ¾; Vilátikulam (temple near a tank bund to the N.W. of the village) 40° 38′, miles 1½; and Vilvamartapati (large tiled house in the village) 113° 5′, mile ¾.

LXXII. Melakalúruni Tower Station, lat. 9° 14′, long. 78° 13′—observed at in 1875—is on the S. or S.E. part of the tank bund 17 feet above the adjacent field, 120 yards E. by N. from the small hamlet of this name, 1⅜ miles S.W. of Sirangapuram, 2½ miles E. of Nágalápuram on the high road from Vilátikulam to Madura, and 4 miles W.S.W. of Pudalapuram. It is in the lands of Sirangapuram village, taluk Ŏtapidáram, district Tinnevelly.

The station consists of a perforated, circular and isolated pillar of brick masonry 11·09 feet high, above the bund level, standing on a solid pillar or block of masonry sunk to a depth of 20 feet below the bund level. The solid pillar contains five mark-stones, one at the bund level and four others at 5, 10, 15 and 20 feet respectively below it. Access to the mark at the bund level is obtained through an aperture in the perforated pillar. The azimuths and distances of the following villages are:—Melakalúruni 82°, yards 120; Kílakalúruni 289°, mile 0·6; and Nágalápuram 81°, miles 2½.

LXXIII. Supalápuram Tower Station, lat. 9° 4′, long. 78° 7′—observed at in 1875—is situated in the open fields, about ¼ mile N.W. of the village of this name, 7½ miles S.E. of Ĕtaiyápuram town, and 7 miles S.W. of Vilátikulam on the high road from Sátúr. It is in the lands of the village of Supalápuram, taluk Ŏtapidáram, district Tinnevelly.

The station consists of a perforated pillar of masonry 21 feet high, standing on a stone foundation 8 feet square, which contains two mark-stones, one at the ground level and the other 3·17 feet below it imbedded in the foundation. The pillar is 6 feet square at the ground level, 3¼ feet square at a height of 20 feet, and thereafter circular and 3½ feet in diameter. Access to the ground level mark is obtained through an aperture on the E. side. The azimuths and distances of the following places are:—Kariyámpati 127°, mile ¾; Pudupati 144°, miles 3; Aronkulam 184°, mile ¾; and Supalápuram (chattram) 317° 4′, mile ¼.

LXXIV. Mínákshi Hill Station, lat. 9° 13′, long. 78° 1′—observed at in 1875—is situated on the middle of the summit of the pyramidal-shaped roof of the Mínákshi-Malaipati temple called Pŏichola Mĕyiráyankoil, built on a rock which rises about 120 feet above the surrounding plain of black soil, about 4 miles N. by W. of the town of Ĕtaiyapuram, and 5¾ miles S.W. of Tappati on the high road from Vipar to Sátúr town. The station is in the lands of Mínákshipuram, taluk Ŏtapidáram, district Tinnevelly.

The station consists of a circular isolated pillar of masonry built around a circle and dot engraved on a stone set in the flat portion of the chunam ridge or crest of the roof of the temple, 14 inches W. by N. of the centre of the temple and 9·7 feet above the floor. The station mark is 6·33 feet from the S. side, 6·13 feet from the N. side, 5·08 feet from the W. side and 7·35 feet from the E. side of the base of the roof which is about 12¼ feet square and 14 feet above the rock on which the temple is built. This station is most probably identical with that of "Meenachipooram" of Colonel Lambton's triangulation, though no allusion to the finding of a mark or pillar of any kind is made by the party visiting it in 1875. The directions, azimuths and distances of the following places are:—Ĕtaiyapuram (centre of three domes) 343° 53′, miles 4·23; Mínákshipuram 174°, mile 0·9; Kadalai W.S.W., miles 2½; Karuppúr N.N.E., miles 2¼; and Kotúr E.N.E., miles 4¾.

LXXXIII.—(*Of the Great Arc Meridional Series, Section 8° to 18°*). Koilpati Hill Station, lat. 9° 10′, long. 77° 54′—observed at in 1874 and 1875—is situated on the highest point of a small rocky hill called Koilpati-parambu. The high road from Tinnevelly to Madura and the Railway line from Tuticorin pass close by the N.W. foot of the hill. The station is in the lands of Koilpati village, taluk Sátúr, district Tinnevelly.

The station consists of a platform of earth and stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·10 feet above it on a stone imbedded flush with the upper surface of the pillar. When again visited in 1875, in connection with the operations of the South-East Coast Series, the station was found in good order and evidently untampered with. The azimuths and distances of the following places are:—Manditop 14°, mile 1; Maniyáchi 133°, mile ¾; Revenue Survey trijunction boundary stone of Koilpati, Alampati and Manditop villages 32° 33′, feet 86·5; Koilpati (northern and larger spire of a temple) 225° 42′, mile 1·00; and Mupampati (centre of the roof of a small temple) 202° 32′, miles 1¾.

LXXXV.—(*Of the Great Arc Meridional Series, Section 8° to 18°*). Kulayanallúr Hill Station, lat. 8° 56′, long. 78° 1′—observed at in January and December 1874—is situated on the highest part of a stony ridge or mound rising about 150 feet above the surrounding plain, about 3 miles nearly west of Ŏtapidáram town, 3½ miles E. by N. of Singampati on the high road from Ŏtapidáram to Tĕnkási. It is in the lands of the village of Araikulam, taluk Ŏtapidáram, district Tinnevelly.

The station consists of the usual platform of earth and stones, enclosing a solid isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one at the ground level and the other 1 foot above it on the surface of the pillar. The station is built over a mark which was found imbedded in the surface of a rough platform flush with the ground level, probably of Colonel Lambton's station of "Kolanelloor." Search was made at the time for lower marks but none were found. When again visited in December 1874, in connection with the operations of the South-East Coast Series, "the station was found covered up just as when left last season and in good order and evidently untouched in the interval." The directions, azimuths and distances of the following places and objects are:—Araikulam 120°, mile ¾; Kulasekharanallúr 7°, miles 1¾; Moramban S.W., miles 3¼;

Vellapuram N.E., mile ¾; Kílamangalam N.N.W., miles 1¾; No. 1, Revenue Survey stone 8° 57′, miles 1·12; No. 2, Revenue Survey stone 1° 47′, miles 1·10; No. 3, Revenue Survey stone 343° 14′, mile 0·88; No. 4, Revenue Survey stone 338° 41′, mile 0·65; No. 5, Revenue Survey stone 311° 58′, mile 0·78; and No. 6, Revenue Survey stone 302° 38′, mile 0·92.

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LXXV. Púvarasanhalli Tívu Station, lat. 9° 9′, long. 78° 48′—observed at in 1875—is situated on a very small sand and coral islet about 170 yards long and 50 yards wide, oval in shape stretching in a N.W. and S. E. direction, about a mile E.N.E. of the Palayamunai island, and 6 miles S.W. by S. of Kílakarai. The station is on about the widest part and in the centre of the island, 50 feet from the high water mark due N. of it, and 56 yards from the S.E. extremity of the islet. Taluk Ramnad, district Madura.

The station is denoted by a circle and dot cut on the head of a wooden pile driven into the ground. This station was reported by the district officer, in February 1883, to have been destroyed.

LXXVI. Appa Tívu Station, lat. 9° 10′, long. 78° 52′—observed at in 1875—is situated on the highest sand bank at the southern extremity of the eastern portion of the Appa Tívu island, about 13 feet above the high water mark, and about 5½ miles S.S.E. of Kílakarai. The island is about 1¼ miles long from N.E. to S.W. and varies in breadth from 40 to 1200 feet, the narrowest portion is about the centre which is submerged at high water. Taluk Ramnad, district Madura.

The station is denoted by a circle and dot cut on the head of a wooden pile driven into the ground.

LXXVII. Pĕriyapatnam Station, lat. 9° 15′, long. 78° 57′—observed at in 1875—is situated on a low sand hillock near a headland of the coast, about a mile S.W. of Pĕriyapatnam village, and 118 feet E.S.E. of the Mutupet S.W. boundary stone; the station is in a clump of palmyras, 750 yards from the sea. It is in the lands of Mutupet village, taluk Ramnad, district Madura.

The station consists of a mark-stone buried deep in the sand and having a large wooden pile erected over it and carrying a mark engraved on its head 10½ feet above the mark-stone: the pile is surrounded with sand piled up nearly to its summit.

LXXVIII. Válai Tívu Station, lat. 9° 11′, long. 78° 59′—observed at in 1875—is situated on the eastern portion of the island, 2 or 3 feet above the high water mark, about 10 miles E. by S. of Kílakarai, 6 miles S.S.E. of Mutupet, and 2 miles W. of Muli Tívu. This portion of the island is about ½ a mile long and 400 yards wide, and is separated at high water from the western portion which is densely covered with tree and thorn jungle. Taluk Ramnad, district Madura.

The station is denoted by a wooden pile driven into the ground, having a circle and dot cut on its summit nearly 5 feet above the ground level.

LXXIX. Rámaswámi Madam Station, lat. 8° 16′, long. 79° 6′—observed at in 1875—is situated on a sand hillock about 40 feet high, 320 yards N. by E. of the chattram known as Kodipothiánthedal, and about ½ a mile N.W. of Chini Appa Pillai's dargah. The station is in taluk Ramnad, district Madura.

The station consists of a platform enclosing a solid circular pillar of masonry 3½ feet in diameter, surrounded by an annular wall; it contains two marks, one in its upper surface and the other 0·75 foot below it, engraved on a stone imbedded in the foundation.

LXXX. Musal Tívu Trestle Station, lat. 9° 12′, long. 79° 7′—observed at in 1875—is situated on a large island so called, about 4 miles due south of Rámaswámi Madam, and 3 or 4 miles W. of Mannáli Tívu. The station is on the north or northwestern point of the island, about 25 yards from the high water mark, 1700 yards N.W. of a small Roman Catholic shrine, and 1400 yards N.N.W. of a large banian tree (the most conspicuous object on the island); the shrine and the tree are on the eastern portion of the island. Taluk Ramnad, district Madura.

The station consists of a solid circular pillar of masonry 3½ feet in diameter and contains two mark-stones, one set in the foundation about the ground level and the other 0·75 foot above it in the upper surface of the pillar.

LXXXI. Marakayárpatnam Station, lat. 9° 17′, long. 79° 10′—observed at in 1875 and 1876—is situated on a sand hillock about 55 feet high, 265 yards S.E. by S. of milestone No. 22 on the high road from Ramnad to Pámban, and 500 yards N. by W. of Marakayárpatnam town. Taluk Ramnad, district Madura.

The station consists of a platform enclosing a solid circular pillar of masonry 3½ feet in diameter and contains two mark-stones, one in the foundation and the other 0·9 foot above it in the surface of the pillar. When again visited in 1876 it was found in good order and no alteration in its construction was made. The bearings and distances of the circumjacent places are:—Vittilai Mantapam E., miles 1·49; Marakayárpatnam mosque S.S.W., mile 0·26; and Pámban light-house E. by N., miles 6·13.

LXXXII. Púmurichán Station, lat. 9° 15′, long. 79° 13′—observed at in 1875 and 1876—is on the conspicuous beacon on the western edge of the Pulli island, 80 feet E. from the high water mark, and about 4½ miles S. W. of the Pámban Light-house. The beacon is built of stone masonry, 29 feet high and 10 feet square at base, and tapers upwards ending in a pyramid, and belongs to the Madras Marine Department. Taluk Ramnad, district Madura.

The station is denoted by a mark-stone imbedded in the middle of the pyramid about a foot below its point. For the accommodation of the theodolite, the pyramidal top of the beacon was removed and a circular pillar 40 inches in diameter was built round the mark-stone: when again visited in 1876, the station was found intact. On completion of the observations, this pillar was removed and the summit of the beacon restored to its original height and shape with the mark-stone left in it. The azimuths and distances of the circumjacent places are:—Kurusadi island beacon 259° 44′, miles 2·45; Kurusadi hospital (for Ceylon Cooly emigrants) 260° 11′, miles 2·74; Pámban Light-house 220° 33′, miles 4·12; and Tonituraí beacon (southern of two) 176° 41′, miles 2·60.

LXXXIII. Gandhamána Station, lat. 9° 18′, long. 79° 21′—observed at in 1876—is on the roof of the Gandhamána Parvatam temple on a sand hillock rising about 85 feet above its base, and about 1 mile N.W. of Rámeswaram town. The station is in the centre of the S.E. bay of the double colonnade on the roof of the temple. Taluk Pámban, district Madura.

The station is denoted by a circle and dot engraved on the roof in the centre of the four southeasternmost columns forming a square (6·56 by 6·36 feet) with their innermost corners nearly 9 feet diagonally apart. The station mark is about 10½ feet from the centre of the roof under the temple spire, and the same distance N.W. from the head of the steps by which the roof is reached. The colonnade supports a second roof at a height of 9 feet above the station mark. The azimuths and distances of the circumjacent places are:—Rámeswaram (large temple) 324° 25′, miles 1·25; Rámeswaram (unfinished temple) 319° 6′, miles 1·33; Pámban Light-house 80° 21′, miles 6·01; and Kŏdándarámaswámi temple 329° 2′, miles 5·60.

LXXXIV. Pisásu Mundal Trestle Station, lat. 9° 20′, long. 79° 21′—observed at in 1876—is situated on the small sand ridge in a field called Vadakád at the northern extremity of the Rámeswaram island, about 40 yards S. of the high water mark, 1·8 miles N. by E. of the Gandhamána Parvatam. It is in the lands of the village of Devamankád, taluk Pámban, district Madura.

The station consists of a solid circular pillar of masonry 2 feet high and 3½ feet in diameter and contains two mark-stones, one in the foundation about 1 foot below the ground level and the other 2 feet above it flush with the upper surface of the pillar. The azimuths and distances of the circumjacent villages are:—Devamankád 314°, miles 1·7; and Vadakád 55°, miles 1·1.

LXXXV. Masánam Karai Station, lat. 9° 16′, long. 79° 22′—observed at in 1876—is situated on the drifting sand hillock rising about 50 feet above the sea level, about 1½ miles S. of the Rámeswaram temple, and 300 yards S. E. by E. of a small square masonry temple called Mári Ammankoil. Taluk Pámban, district Madura.

The station consists of a circle and dot cut on the head of a wooden pile driven deeply into the highest point of the sand hill. As the sand hill is constantly shifting, the station is not likely to remain in existence any length of time. The azimuths and distances of the circumjacent places are:—Sadai-yu-tíratánkoil 13° 43′, mile 0·75; Kŏdándarámaswámi temple 317° 29′, miles 3·02; and Kundukál masonry beacon 88° 2′, miles 5·46.

LXXXVI. Kachi Tívu, N., Trestle Station, lat. 9° 24′, long. 79° 34′—observed at in 1876—is situated on the shingle ridge forming the N.N.W. point of the Kachi Tívu island in Palk's Straits, about 12 yards S. of the high water mark, and 16 miles N.E. by N. of Rámeswaram. Taluk Jaffna, N. Province of Ceylon.

The station consists of a solid circular pillar of masonry 1 foot high and 3½ feet in diameter and contains two mark-stones, one flush with its upper surface and the other 1 foot below it at the ground level.

LXXXVII. Kachi Tívu, S., Trestle Station, lat. 9° 23′, long. 79° 34′—observed at in 1876—is situated on the rock 41 feet N. of the edge of the cliff at the extreme S.E. point of the Kachi Tívu island in Palk's Straits, and about 16 miles N.E. by N. of Rámeswaram. Taluk Jaffna, N. Province of Ceylon.

The station consists of a solid circular pillar of masonry 1½ feet high and 3½ feet in diameter and contains three mark-stones, the lowest engraved on the rock *in sitú* and the others ½ foot and 1½ feet respectively above it.

LXXXVIII. Ámanakamunai or Neduvan Tívu Trestle Station, lat. 9° 33′, long. 79° 42′—observed at in 1876—is situated on the coast ridge at the N.W. extremity of the island called Neduvan Tívu or Delft Island in Palk's Straits, about 33 yards S. from the high water mark on the headland, 63 yards E. from the high water mark in the inlet which drains the N.W. part of the island, and about 14 feet above sea level. Taluk Jaffna, N. Province of Ceylon.

The station consists of a platform of loose stones and sand enclosing a solid circular pillar of masonry 5½ feet in diameter and 1 foot above the ground level, built on a foundation 8 feet in diameter and 3 feet deep. The pillar contains two marks, one flush with its upper surface and the other 1 foot below it. Delft Bungalow is E. S. E. about 4 miles.

LXXXIX. Úrimunai or Neduvan Tívu Trestle Station, lat. 9° 28′, long. 79° 46′—observed at in 1876—is situated on the coast ridge at the southeasternmost point of the island called Neduvan Tívu or Delft Island in Palk's Straits, about 35 to 40 yards N. of the high water mark, and 4 miles S. of the Delft Bungalow. Taluk Jaffna, N. Province of Ceylon.

The station consists of a solid circular pillar of masonry 5½ feet in diameter and 1 foot above the ground level, built on a foundation 8 feet in diameter aud 3 feet deep. The pillar contaius two mark-stones, one flush with its upper surface and the other 1 foot below it.

April, 1884.

W. H. COLE,
In charge of Computing Office.

SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. OBSERVED ANGLES.

At XXXIV (Mávandúr)

January 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIX (Avirimodu) 283° 8′	103° 9′	2° 20′	182° 20′	81° 32′	261° 33′	160° 45′	340° 45′	239° 56′	59° 56′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXIX (Avirimodu) and I (Pŏnnúr)	″ *l* 18·86 *l* 18·02 *l* 18·55	″ *l* 17·00 *l* 17·64 *l* 18·38	″ *h* 17·56 *h* 18·90 *h* 17·83	″ *l* 18·35 *l* 18·73 *l* 18·16	″ *l* 17·48 *l* 18·45 *l* 19·32	″ *l* 17·11 *l* 17·76 *l* 17·16	″ *h* 19·32 *h* 18·70 *h* 16·95 *l* 17·40	″ *l* 19·13 *l* 17·88 *l* 18·43	″ *l* 18·85 *l* 18·90 *l* 18·32	″ *l* 18·89 *l* 19·31 *l* 18·89	$M = 18''\cdot27$ $w = 29\ \cdot59$ $\frac{1}{w} = 0\ \cdot03$ $C = 68°\ 57'\ 18''\cdot27$
	18·48	17·67	18·10	18·41	18·42	17·34	18·09	18·48	18·69	19·03	
I (Pŏnnúr) and II (Kaniyanúr)	*l* 55·92 *l* 55·85 *l* 56·19	*l* 57·26 *l* 56·96 *l* 56·93	*h* 55·29 *h* 57·24 *l* 58·01	*l* 57·32 *l* 56·66 *l* 57·40	*l* 58·88 *l* 58·89 *l* 58·14	*l* 57·89 *l* 55·83 *l* 56·83	*h* 55·00 *h* 56·87 *l* 57·03	*l* 56·38 *l* 57·72 *l* 56·39	*l* 55·74 *l* 56·41 *l* 55·74	*l* 57·12 *l* 55·53 *l* 55·87	$M = 56''\cdot78$ $w = 13\ \cdot20$ $\frac{1}{w} = 0\ \cdot08$ $C = 68°\ 41'\ 56''\cdot78$
	55·99	57·05	56·85	57·13	58·64	56·85	56·30	56·83	55·96	56·17	

Note.—Stations XXXIV (Mávandúr) and XXXIX (Avirimodu) appertain to the Madras Longitudinal Series.

At XXXIX (Avirimodu)

January 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on IV (Pĕrumukkal) 210° 26′	30° 26′	289° 38′	109° 38′	8° 50′	188° 50′	88° 2′	268° 2′	167° 14′	347° 14′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
IV (Pĕrumukkal) and I (Pŏnnúr)	h 23·75	h 24·12	l 23·86	l 23·16	h 24·12	h 23·18	l 24·38	l 25·41	h 23·36	h 23·49	$M = 24''\cdot19$
	h 24·77	l 26·79	l 24·90	l 22·90	h 23·12	h 22·95	l 24·19	l 24·77	h 24·89	h 25·19	$w = 16\cdot90$
	h 24·63	l 24·84	l 24·82	l 23·21	h 23·18	h 24·20	l 23·66	l 24·68	h 24·67	h 24·38	$\frac{1}{w} = 0\cdot06$
	24·38	25·25	24·53	23·09	23·47	23·44	24·08	24·95	24·31	24·35	$C = 62^\circ\ 39'\ 24''\cdot19$
I (Pŏnnúr) and XXXIV (Mávandúr)	h 14·93	h 15·72	l 17·50	l 17·93	h 15·78	h 17·44	l 14·57	l 14·66	h 16·12	h 15·52	$M = 15''\cdot82$
	h 14·88	l 14·44	l 16·23	l 16·62	h 15·01	h 16·51	l 15·97	l 15·60	h 14·66	h 14·94	$w = 12\cdot20$
	h 14·38	l 16·88	l 16·67	l 16·87	h 16·60	h 16·92	l 15·08	l 15·53	h 14·79	h 15·88	$\frac{1}{w} = 0\cdot08$
	14·73	15·68	16·80	17·14	15·80	16·96	15·21	15·26	15·19	15·45	$C = 43^\circ\ 51'\ 15''\cdot82$

At I (Pŏnnúr)

December 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on II (Kaniyanúr) 0° 1′	180° 1′	79° 12′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
II (Kaniyanúr) and XXXIV (Mávandúr)	h 20·55	l 21·15	l 21·26	h 21·57	l 19·40	l 21·71	l 20·52	l 21·24	l 20·86	l 20·45	$M = 20''\cdot96$
	h 20·51	l 21·43	l 20·64	h 22·45	l 19·76	l 22·18	l 21·52	l 22·09	l 19·61	l 19·22	$w = 12\cdot80$
	l 21·65	l 21·92	l 20·84	h 23·22	l 20·52	l 20·80	l 20·34	l 21·36	l 20·68	l 19·36	$\frac{1}{w} = 0\cdot08$
	20·90	21·50	20·91	22·41	19·89	21·56	20·79	21·56	20·38	19·68	$C = 58^\circ\ 7'\ 20''\cdot96$
XXXIV (Mávandúr) and XXXIX (Avirimodu)	h 29·31	l 29·89	l 28·85	h 29·28	l 27·64	l 29·04	l 29·12	h 28·77	l 28·93	l 29·03	$M = 28''\cdot89$
	h 28·92	l 29·07	l 29·50	h 28·92	l 28·30	l 28·10	l 27·66	l 29·88	l 29·40	l 29·61	$w = 37\cdot00$
	l 27·38	l 28·46	l 29·45	h 28·62	l 28·03	l 29·55	l 28·80	l 28·43	l 29·07	l 29·60	$\frac{1}{w} = 0\cdot03$
	28·54	29·14	29·27	28·94	27·99	28·90	28·53	29·03	29·13	29·41	$C = 67^\circ\ 11'\ 28''\cdot89$
XXXIX (Avirimodu) and IV (Pĕrumukkal)	h 12·44	l 11·91	l 12·02	h 13·15	l 13·97	l 13·32	l 11·85	h 12·46	l 13·14	l 13·07	$M = 12''\cdot49$
	h 12·46	l 12·33	l 10·72	h 12·49	l 13·04	l 13·50	l 13·16	l 11·65	l 13·62	l 11·97	$w = 20.40$
	l 12·42	l 12·63	l 10·41	h 12·08	l 12·87	l 13·01	l 12·69	l 12·03	l 11·63	l 12·58	$\frac{1}{w} = 0\cdot05$
	12·44	12·29	11·05	12·57	13·29	13·28	12·57	12·05	12·80	12·54	$C = 48^\circ\ 47'\ 12''\cdot49$

Note.—Stations XXXIV (Mávandúr) and XXXIX (Avirimodu) appertain to the Madras Longitudinal Series.

At I (Pŏnnúr)—(*Continued*).

Angle between	Circle readings, telescope being set on II (Kaniyanúr) 0° 1′	180° 1′	79° 12′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
IV (Pĕrumukkal) and V (Gingee)	h 47·14 h 46·76 l 47·71	l 46·94 l 47·54 l 47·49	l 47·84 l 47·08 l 48·03	h 47·90 h 47·80 h 47·16	l 47·69 l 47·27 l 48·06	l 46·54 l 46·55 l 46·52	l 47·26 l 47·20 l 45·68	h 45·43 l 46·53 l 46·52	l 47·47 l 45·99 l 47·79	l 47·55 l 46·56 l 47·81	M = 47″·13 w = 29·40 1/w = 0·03 C = 61° 59′ 47″·13
	47·20	47·32	47·65	47·62	47·67	46·54	46·71	46·16	47·08	47·31	
V (Gingee) and III (Narasingapuram)	h 45·90 h 47·82 l 47·10	l 47·66 l 45·91 l 46·45	l 46·83 l 46·86 l 48·31	h 44·64 h 45·96 h 46·26	l 46·58 l 47·09 l 47·13	l 46·50 l 46·77 l 46·97	l 47·46 l 47·22 l 49·44	h 47·02 l 46·59 l 47·09	l 47·03 l 48·55 l 47·94	l 47·78 l 48·54 l 47·65	M = 47″·10 w = 14·90 1/w = 0·07 C = 67° 50′ 47″·10
	46·94	46·67	47·33	45·62	46·93	46·75	48·04	46·90	47·84	47·99	
III (Narasingapuram) and II (Kaniyanúr)	h 24·09 h 23·84 l 23·80	l 22·35 l 23·45 l 22·80	l 23·96 l 23·83 l 23·64	h 24·24 h 23·71 h 22·99	l 24·48 l 23·82 l 23·66	l 23·34 l 22·89 l 23·31	l 23·29 l 23·04 l 23·43	h 25·04 l 23·97 l 23·41 l 24·22	l 22·82 l 22·52 l 22·99	l 23·22 l 23·65 l 23·72	M = 23″·51 w = 37·15 1/w = 0·03 C = 56° 3′ 23″·51
	23·91	22·87	23·81	23·65	23·99	23·18	23·25	24·16	22·78	23·53	

At II (Kaniyanúr)

December 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIV (Mávandúr) 0° 1′	180° 1′	79° 12′	259° 12′	158° 25′	338° 24′	237° 36′	57° 36′	316° 49′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXIV (Mávandúr) and I (Pŏnnúr)	h 44·16 h 43·93 h 44·00	h 44·09 l 45·57 l 44·92	l 43·76 l 42·95 l 43·15	l 45·68 l 45·60 l 45·84	l 44·51 l 43·34 l 43·46	h 44·59 h 45·33 h 45·60	h 44·15 l 43·59 l 43·53	l 45·04 l 44·48 l 45·20	l 44·45 l 44·75 l 44·81	l 44·07 l 45·34 l 43·45	M = 44″·45 w = 16·10 1/w = 0·06 C = 53° 10′ 44″·45
	44·03	44·86	43·29	45·71	43·77	45·17	43·76	44·91	44·67	44·29	
I (Pŏnnúr) and III (Narasingapuram)	h 36·43 h 35·62 h 36·12	h 37·10 l 36·17 l 35·88	l 35·86 l 35·36 l 36·24	l 35·69 l 35·97 l 35·96	l 35·83 l 36·07 l 36·61	l 35·80 h 34·96 h 35·08	h 35·99 l 36·74 l 36·47	l 35·53 l 35·57 l 34·66	l 36·59 l 36·16 l 36·43	l 35·47 l 35·10 l 35·32	M = 35″·89 w = 38·50 1/w = 0·03 C = 47° 44′ 35″·89
	36·06	36·38	35·82	35·87	36·17	35·28	36·40	35·25	36·39	35·30	

NOTE.—Station XXXIV (Mávandúr) appertains to the Madras Longitudinal Series.

At III (Narasingapuram)

December 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on II (Kaniyanúr) 136° 42′	316° 42′	215° 53′	35° 53′	295° 5′	115° 5′	14° 17′	194° 17′	93° 29′	273° 29′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
II (Kaniyanúr) and I (Pŏnnúr)	h 3·02	h 2·64	l 1·48	l 2·25	h 3·10	h 2·60	h 1·30	l 2·81	l 3·30	l 3·17	M = 2″·79
	l 3·17	h 2·86	l 2·16	l 1·67	h 4·48	h 2·94	h 3·28	l 2·77	l 2·90	l 2·73	w = 33 ·42
	l 2·73	h 2·62	l 3·12	l 2·68	h 4·28	h 2·89	l 2·11	l 2·77	l 3·20	l 3·25	$\frac{1}{w}$ = 0 ·03
					h 3·34						
	2·97	2·71	2·25	2·20	3·80	2·81	2·23	2·78	3·13	3·05	C = 76° 12′ 2″·79
I (Pŏnnúr) and V (Gingee)	h 21·66	h 21·98	l 23·55	l 23·56	h 23·51	h 22·44	h 22·47	l 23·31	l 21·66	l 22·99	M = 22″·73
	l 22·00	h 21·89	l 22·96	l 23·61	h 21·94	h 22·40	h 22·83	l 23·65	l 22·37	l 24·14	w = 21 ·30
	l 22·43	h 22·13	l 22·87	l 23·17	h 22·23	h 21·92	l 22·67	l 23·55	l 22·06	l 23·82	$\frac{1}{w}$ = 0 ·05
	22·03	22·00	23·13	23·45	22·56	22·25	22·66	23·50	22·03	23·65	C = 60° 28′ 22″·73

At IV (Pĕrumukkal)

March 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VI (Kallapat) 0° 1′	180° 0′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VI (Kallapat) and VII (Mallipat)	l 53·44	l 54·64	l 54·17	l 55·41	l 53·01	l 54·88	l 56·67	l 55·15	l 55·12	l 53·81	M = 54″·78
	l 54·31	l 55·69	l 54·62	l 56·49	l 53·83	l 55·50	l 55·85	l 54·66	l 54·83	l 54·03	w = 14 ·30
	l 55·20	l 55·32	l 53·75	l 55·71	l 53·96	l 54·33	l 55·65	l 54·98	l 54·63	l 53·85	$\frac{1}{w}$ = 0 ·07
	54·32	55·22	54·18	55·87	53·60	54·90	56·06	54·93	54·86	53·90	C = 22° 13′ 54″·78
VII (Mallipat) and V (Gingee)	l 55·34	l 53·94	l 53·04	l 53·42	l 54·51	l 55·10	l 53·59	l 53·91	l 52·75	l 54·81	M = 53″·89
	l 54·97	l 52·82	l 53·23	l 52·17	l 53·50	l 53·88	l 54·11	l 54·86	l 52·99	l 53·85	w = 19 ·20
	l 54·40	l 53·82	l 53·82	l 53·01	l 54·71	l 53·79	l 54·09	l 54·83	l 53·20	l 54·24	$\frac{1}{w}$ = 0 ·05
	54·90	53·53	53·36	52·87	54·24	54·26	53·93	54·53	52·98	54·30	C = 41° 42′ 53″·89
V (Gingee) and I (Pŏnnúr)	l 13·65	l 13·78	l 12·40	l 13·13	l 13·76	h 14·12	l 13·87	l 13·42	l 14·89	l 13·12	M = 13″·66
	l 13·68	l 14·71	l 12·65	l 13·86	l 14·43	h 14·46	l 14·47	l 12·75	l 13·42	l 13·93	w = 21 ·70
	l 14·02	l 13·90	l 11·49	l 14·67	h 12·29	h 14·45	l 13·82	l 13·61	l 13·30	l 13·67	$\frac{1}{w}$ = 0 ·05
	13·78	14·13	12·18	13·89	13·49	14·34	14·05	13·26	13·87	13·57	C = 46° 31′ 13″·66

At IV (Pĕrumukkal)—(*Continued*).

Circle readings, telescope being set on VI (Kallapat)

M = Mean of Groups; w = Relative Weight; C = Concluded Angle

Angle between	0° 1′	180° 0′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M, w, C
	″	″	″	″	″	″	″	″	″	″	
I (Pŏnnúr) and XXXIX (Avirimodu)	l 26·25	l 26·14	l 27·17	l 27·94	l 26·26	h 26·46	l 26·36	l 26·70	l 26·54	l 26·70	$M = 26''\cdot67$
	l 26·81	l 26·72	l 27·13	l 26·42	l 25·61	h 26·99	l 26·98	l 27·03	l 26·64	l 26·59	$w = 52\cdot60$
	l 26·84	l 26·11	l 28·10	l 25·82	h 26·05	h 26·76	l 26·59	l 26·40	l 27·28	l 26·75	$\frac{1}{w} = 0\cdot02$
	26·63	26·32	27·47	26·73	25·97	26·74	26·64	26·71	26·82	26·68	$C = 68^\circ 33' 26''\cdot67$

At V (Gingee)

March 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Circle readings, telescope being set on III (Narasingapuram)

M = Mean of Groups; w = Relative Weight; C = Concluded Angle

Angle between	208° 33′	28° 33′	287° 44′	107° 44′	6° 57′	186° 56′	86° 9′	266° 9′	165° 21′	345° 21′	M, w, C
	″	″	″	″	″	″	″	″	″	″	
III (Narasingapuram) and I (Pŏnnúr)	l 51·76	l 51·96	l 52·50	l 52·68	l 51·40	l 52·20	l 51·31	l 53·42	l 53·09	l 53·59	$M = 52''\cdot45$
	l 52·30	l 52·24	l 52·63	l 53·82	l 52·71	l 53·23	l 51·11	h 53·11	l 52·47	l 53·28	$w = 32\cdot52$
	l 52·66	l 52·97	l 52·28	l 52·52	l 51·62	l 52·85	l 51·93	h 52·43	l 52·09	l 51·83	$\frac{1}{w} = 0\cdot03$
										h 52·10	
	52·24	52·39	52·47	53·01	51·91	52·76	51·45	52·99	52·55	52·70	$C = 51^\circ 40' 52''\cdot45$
I (Pŏnnúr) and IV (Pĕrumukkal)	l 2·15	l 3·03	l 1·57	l 2·57	l 3·13	l 1·35	l 1·39	l 1·28	l 1·20	l 1·12	$M = 1''\cdot90$
	l 2·48	l 3·24	l 1·80	l 1·79	l 1·35	l 1·50	l 1·80	h 1·57	l 1·08	l 2·02	$w = 27\cdot88$
	l 2·48	l 2·35	l 1·92	l 1·92	l 3·17	l 1·09	l 1·46	h 2·40	l 1·91	l 0·67	$\frac{1}{w} = 0\cdot04$
										l 1·56	
	2·37	2·87	1·76	2·09	2·55	1·31	1·55	1·75	1·40	1·34	$C = 71^\circ 29' 1''\cdot90$
IV (Pĕrumukkal) and VI (Kallapat)	l 14·48	l 14·74	l 14·12	l 14·56	l 14·61	l 13·67	l 15·50	l 14·14	l 15·03	l 13·41	$M = 14''\cdot60$
	l 13·83	l 14·75	l 14·19	l 14·30	l 14·94	l 15·17	l 15·59	h 14·99	l 16·07	l 13·60	$w = 40\cdot17$
	l 13·99	l 14·96	l 14·15	l 15·05	l 14·63	l 14·22	l 14·98	h 13·92	l 14·45	l 14·87	$\frac{1}{w} = 0\cdot02$
										l 15·37	
	14·10	14·82	14·15	14·64	14·73	14·35	15·36	14·35	15·18	14·31	$C = 52^\circ 1' 14''\cdot60$
VI (Kallapat) and VII (Mallipat)	l 43·85	l 43·68	l 45·58	l 44·00	l 45·15	l 43·47	l 44·11	l 43·67	l 43·78	l 45·42	$M = 44''\cdot23$
	l 44·15	l 43·48	l 45·00	l 44·63	l 45·02	l 43·50	l 44·27	h 43·90	l 43·40	l 45·49	$w = 25\cdot67$
	l 43·81	l 44·14	l 44·65	l 43·56	l 45·23	l 43·25	l 43·98	h 44·68	l 44·35	l 44·43	$\frac{1}{w} = 0\cdot04$
										l 44·31	
	43·94	43·77	45·08	44·06	45·13	43·41	44·12	44·08	43·84	44·91	$C = 33^\circ 20' 44''\cdot23$

At VI (Kallapat)

March 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on X (Vallam) 206° 24′	26° 24′	285° 35′	105° 35′	4° 48′	184° 48′	83° 59′	263° 59′	163° 11′	343° 11′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
X (Vallam) and VIII (Chĕndamangalam)	″	″	″	″	″	″	″	″	″	″	
	h 42·48	l 39·25	l 40·47	l 42·76	h 39·36	l 41·44	l 40·41	l 38·68	h 41·88	l 40·04	$M = 40''{\cdot}47$
	h 39·07	l 40·48	l 41·41	l 41·23	h 40·09	l 41·12	h 39·78	l 39·80	l 41·84	l 39·53	$w = 9{\cdot}80$
	h 38·73	h 39·89	l 41·32	l 42·50	l 38·40	l 40·08	l 41·19	l 39·50	h 39·59	l 41·68	$\frac{1}{w} = 0{\cdot}10$
	40·09	39·87	41·07	42·16	39·28	40·88	40·46	39·33	41·10	40·42	$C = 31^\circ\ 42'\ 40''{\cdot}47$
VIII (Chĕndamangalam) and VII (Mallipat)	l 53·00	l 54·44	l 55·43	l 53·64	h 53·08	l 53·06	l 55·89	l 53·68	h 52·23	l 53·19	$M = 53''{\cdot}77$
	h 54·25	l 54·32	l 53·69	l 52·94	h 53·98	l 54·43	h 55·68	l 53·23	l 53·96	l 53·89	$w = 9{\cdot}54$
	h 55·27	h 54·79	l 54·26	l 52·33	l 54·07	h 52·09	l 55·27	l 53·30	h 50·70	l 53·10	$\frac{1}{w} = 0{\cdot}10$
									h 52·25		
	54·17	54·52	54·46	52·97	53·71	53·19	55·61	53·40	52·29	53·39	$C = 54^\circ\ 2'\ 53''{\cdot}76$
VII (Mallipat) and V (Gingee)	l 6·65	l 4·11	l 3·70	l 4·75	h 4·38	l 3·86	l 4·18	l 3·10	h 4·89	l 4·74	$M = 4''{\cdot}19$
	h 5·05	l 3·57	l 4·28	l 4·57	h 3·88	l 2·71	h 3·77	l 2·55	l 3·00	l 5·14	$w = 13{\cdot}82$
	h 4·99	h 6·40	l 3·90	l 4·27	l 3·79	h 3·80	l 2·66	l 3·04	h 4·76	l 5·01	$\frac{1}{w} = 0{\cdot}07$
		h 4·76					l 3·66				
	5·56	4·71	3·96	4·53	4·02	3·46	3·57	2·90	4·22	4·96	$C = 56^\circ\ 35'\ 4''{\cdot}19$
V (Gingee) and IV (Pĕrumukkal)	l 58·16	l 58·11	l 59·96	l 59·54	h 60·46	l 60·11	l 59·52	l 58·10	h 58·58	l 60·18	$M = 59''{\cdot}16$
	h 58·10	l 58·36	l 59·88	l 60·25	h 60·10	l 60·06	h 58·54	l 60·18	l 57·80	l 58·49	$w = 11{\cdot}32$
	h 57·73	h 56·66	l 60·27	l 59·91	l 60·85	l 58·62	l 59·49	l 59·54	h 57·79	l 59·32	$\frac{1}{w} = 0{\cdot}09$
		h 59·30					l 58·58	l 58·57			
	58·00	58·11	60·04	59·90	60·47	59·60	59·03	59·10	58·06	59·33	$C = 64^\circ\ 1'\ 59''{\cdot}16$

At VII (Mallipat)

March 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on V (Gingee) 0° 1′	180° 1′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 36′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
V (Gingee) and IV (Pĕrumukkal)	″	″	″	″	″	″	″	″	″	″	
	h 10·38	l 11·48	l 11·04	l 11·01	h 10·13	l 10·44	l 10·61	l 9·83	l 10·83	l 11·27	$M = 10''{\cdot}79$
	h 10·41	l 11·48	l 11·12	l 10·82	h 10·18	l 11·44	l 9·82	l 10·58	l 11·59	l 10·40	$w = 37{\cdot}00$
	h 10·13	l 11·72	l 11·14	h 12·02	l 10·68	l 10·68	l 9·94	h 10·76	l 10·62	l 11·09	$\frac{1}{w} = 0{\cdot}03$
	10·31	11·56	11·10	11·28	10·33	10·85	10·12	10·39	11·01	10·92	$C = 52^\circ\ 55'\ 10''{\cdot}79$

At VII (Mallipat)—(*Continued*).

Angle between	Circle readings, telescope being set on V (Gingee) 0° 1′	180° 1′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 36′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
IV (Pěrumukkal) and VI (Kallapat)	″ h 3·15 h 3·48 h 3·83	″ l 2·72 l 3·33 l 3·52	″ l 3·66 l 4·30 l 3·86	″ l 2·98 l 2·58 h 2·75	″ h 2·77 h 3·18 l 3·19	″ l 3·39 l 3·66 l 3·89	″ l 4·58 l 3·74 l 4·34	″ l 2·76 l 2·62 h 2·19	″ l 2·90 l 3·62 l 3·57	″ l 2·57 l 3·20 l 2·51	$M = 3''\cdot30$ $w = 30\cdot30$ $\frac{1}{w} = 0\cdot03$ $C = 37^\circ\ 9'\ 3''\cdot30$
	3·49	3·19	3·94	2·77	3·05	3·65	4·22	2·52	3·36	2·76	
VI (Kallapat) and VIII (Chěndamangalam)	h 57·79 h 57·39 h 58·03	l 58·55 l 58·13 l 58·41	l 56·84 l 56·12 l 55·83	l 56·90 l 58·65 h 56·13	h 57·18 h 57·59 l 57·69	l 58·61 l 56·78 l 56·34	l 56·98 l 57·42 l 57·14	l 59·25 l 58·33 h 59·37	l 56·46 l 56·64 l 55·37	l 57·27 l 57·47 l 57·11	$M = 57''\cdot39$ $w = 12\cdot20$ $\frac{1}{w} = 0\cdot08$ $C = 86^\circ\ 47'\ 57''\cdot39$
	57·74	58·36	56·26	57·23	57·49	57·24	57·18	58·98	56·16	57·28	
VIII (Chěndamangalam) and IX (Kiliyúr)	h 28·14 h 29·47 h 28·47	l 26·51 l 27·15 l 27·30	l 28·34 l 28·28 l 29·49	l 27·68 l 26·30 h 28·58	h 28·86 h 28·66 l 28·44	l 27·33 l 27·67 l 28·73	l 27·86 l 27·71 l 28·70	l 28·11 l 28·87 h 28·93	l 28·96 l 28·90 l 28·77	l 27·74 l 27·90 l 27·55	$M = 28''\cdot18$ $w = 20\cdot80$ $\frac{1}{w} = 0\cdot05$ $C = 36^\circ\ 3'\ 28''\cdot18$
	28·69	26·99	28·70	27·52	28·65	27·91	28·09	28·64	28·88	27·73	

At VIII (Chěndamangalam)

February 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on X (Vallam) 0° 1′	180° 0′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 36′	316° 49′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
X (Vallam) and XII (Koilánkuppam)	″ l 17·16 l 17·60 l 18·04	″ l 18·28 l 17·79 l 18·24	″ l 17·85 l 18·11 h 18·39	″ l 17·80 l 18·58 l 18·36	″ l 15·68 l 15·99 l 15·58	″ h 18·55 h 18·12 h 19·03	″ l 16·60 l 17·04 l 16·76	″ l 17·00 l 18·28 l 16·95	″ h 17·49 h 17·64 h 17·35	″ l 18·08 l 18·09 l 18·34	$M = 17''\cdot63$ $w = 13\cdot70$ $\frac{1}{w} = 0\cdot07$ $C = 49^\circ\ 10'\ 17''\cdot63$
	17·60	18·10	18·12	18·25	15·75	18·57	16·80	17·41	17·49	18·17	
XII (Koilánkuppam) and XI (Ulundúrpet)	l 59·04 l 58·72 l 58·49	l 57·91 l 58·90 l 58·85	l 59·05 l 58·74 h 59·00	l 57·98 l 57·70 l 57·51	l 57·76 l 58·48 l 58·08	h 57·79 h 58·14 h 58·52	l 58·31 l 58·26 l 57·48	l 58·58 l 58·61 l 58·91	h 58·97 h 58·16 h 56·69 h 57·49	l 59·34 l 57·84 l 58·55	$M = 58''\cdot34$ $w = 42\cdot08$ $\frac{1}{w} = 0\cdot02$ $C = 73^\circ\ 28'\ 58''\cdot34$
	58·75	58·55	58·93	57·73	58·11	58·15	58·02	58·70	57·83	58·58	

At VIII (Chĕndamangalam)—(*Continued*).

Angle between	Circle readings, telescope being set on X (Vallam) 0° 1′	180° 0′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 36′	316° 49′	136° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XI (Ulundúrpet) and IX (Kiliyúr)	l 19·87	l 21·85	l 19·86	l 21·52	l 20·49	h 19·93	l 21·60	l 20·27	h 21·95	l 20·32	$M = 20''\cdot96$
	l 20·39	l 21·37	l 20·34	l 21·51	l 21·13	h 20·79	l 20·29	l 19·80	h 21·51	l 20·80	$w = 25\cdot60$
	l 20·30	l 21·14	h 21·93	l 21·82	l 21·03	h 21·19	l 22·10	l 20·68	h 22·00	l 21·06	$\frac{1}{w} = 0\cdot04$
	20·19	21·45	20·71	21·62	20·88	20·64	21·33	20·25	21·82	20·73	$C = 60^\circ\ 35'\ 20''\cdot96$
IX (Kiliyúr) and VII (Mallipat)	h 1·11	l 2·28	l 2·51	l 3·33	l 4·90	h 3·30	l 3·57	l 3·35	h 1·88	l 2·78	$M = 2''\cdot72$
	l 3·05	l 2·12	l 2·53	l 3·16	l 3·78	h 0·56	l 2·79	l 3·33	h 1·98	l 2·52	$w = 11\cdot13$
	l 2·29	l 2·00	h 1·98	l 4·20	l 4·90	h 1·43	l 3·31	l 2·96	h 1·26	l 2·32	$\frac{1}{w} = 0\cdot09$
	l 2·19										
	2·16	2·13	2·34	3·56	4·53	1·76	3·22	3·21	1·71	2·54	$C = 61^\circ\ 28'\ 2''\cdot72$
VII (Mallipat) and VI (Kallapat)	l 9·98	l 8·25	h 10·34	l 7·44	l 9·29	h 9·70	l 8·95	l 9·64	h 9·76	l 9·46	$M = 9''\cdot15$
	l 8·93	l 9·76	h 8·98	l 7·80	l 8·84	h 9·31	l 9·26	l 10·16	h 8·15	l 9·18	$w = 20\cdot40$
	l 10·29	l 8·88	h 9·44	l 7·70	l 8·44	h 10·05	l 8·59	l 9·86	h 8·82	l 9·10	$\frac{1}{w} = 0\cdot05$
	9·73	8·96	9·59	7·65	8·86	9·69	8·93	9·89	8·91	9·25	$C = 39^\circ\ 9'\ 9''\cdot15$
VI (Kallapat) and X (Vallam)	l 11·58	l 10·00	h 12·15	l 10·12	l 11·74	h 10·34	l 11·19	l 10·63	h 11·73	l 11·08	$M = 11''\cdot00$
	l 11·75	l 10·30	h 11·99	l 10·49	l 11·65	h 10·32	l 10·63	l 9·74	h 11·71	l 10·69	$w = 27\cdot80$
	l 11·23	l 10·94	h 10·82	l 11·12	l 11·59	h 10·94	l 11·60	l 10·35	h 11·30	l 10·43	$\frac{1}{w} = 0\cdot04$
	11·52	10·41	11·65	10·58	11·66	10·53	11·14	10·24	11·58	10·73	$C = 76^\circ\ 8'\ 11''\cdot00$

At IX (Kiliyúr)

March 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VII (Mallipat) 127° 12′	307° 11′	206° 23′	26° 22′	285° 35′	105° 34′	4° 47′	184° 46′	83° 59′	263° 58′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VII (Mallipat) and VIII (Chĕndamangalam)	h 29·59	h 30·16	l 29·40	l 29·80	h 30·46	l 29·62	l 31·50	l 30·31	l 29·51	l 30·51	$M = 29''\cdot99$
	h 30·22	l 31·14	l 28·75	l 29·39	h 31·04	l 29·66	l 30·44	h 30·76	l 28·92	l 29·40	$w = 18\cdot20$
	l 29·26	l 29·74	l 28·32	l 31·01	l 30·32	l 29·27	l 30·68	h 31·53	l 29·29	l 29·75	$\frac{1}{w} = 0\cdot05$
	29·69	30·35	28·82	30·07	30·61	29·52	30·87	30·87	29·24	29·89	$C = 82^\circ\ 28'\ 29''\cdot99$
VIII (Chĕndamangalam) and XI (Ulundúrpet)	h 40·10	h 39·89	l 41·29	l 40·67	h 41·07	l 41·60	l 39·92	l 40·25	l 41·32	l 41·04	$M = 40''\cdot85$
	h 41·22	l 40·15	l 41·81	l 40·26	h 39·82	l 40·81	l 39·42	h 40·92	l 41·53	l 41·90	$w = 22\cdot81$
	h 41·26	l 40·93	l 42·94	l 39·73	h 41·07	l 40·56	l 40·89	h 40·71	l 41·22	l 41·15	$\frac{1}{w} = 0\cdot04$
			l 42·03								
	40·86	40·32	42·02	40·22	40·65	40·99	40·08	40·63	41·36	41·36	$C = 44^\circ\ 41'\ 40''\cdot86$

At X (Vallam)

February 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIII (Seppalánattam) 0° 2′	180° 1′	79° 13′	259° 12′	158° 25′	338° 24′	237° 38′	57° 36′	316° 49′	136° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XIII (Seppalánattam) and XII (Koilánkuppam)	″ h 19·59	″ l 21·35	″ l 20·45	″ l 20·07	″ l 20·49	″ l 20·78	″ h 21·14	″ l 22·17	″ l 22·22	″ l 20·95	$M = 21''·18$
	h 20·83	l 22·12	l 20·26	l 21·35	l 20·87	l 20·97	h 20·83	l 22·04	l 21·80	l 21·49	$w = 22·70$
	h 20·70	l 21·78	l 20·71	l 21·03	l 21·00	l 20·85	h 21·78	l 22·27	l 22·21	l 21·30	$\frac{1}{w} = 0·04$
	20·37	21·75	20·47	20·82	20·79	20·87	21·25	22·16	22·08	21·25	$C = 73° 42' 21''·18$
XII (Koilánkuppam) and VIII (Chĕndamangalam)	h 24·15	l 23·93	l 22·85	l 23·57	l 22·55	l 23·40	h 21·14	l 22·91	l 22·68	l 22·93	$M = 23''·05$
	h 23·19	l 23·49	l 23·24	l 23·31	l 23·03	l 22·71	h 22·26	l 22·87	l 23·05	l 22·14	$w = 29·40$
	h 24·24	l 24·12	l 22·95	l 23·03	l 22·27	l 23·18	h 22·80	l 23·44	l 22·89	l 23·26	$\frac{1}{w} = 0·03$
	23·86	23·85	23·01	23·30	22·62	23·10	22·07	23·07	22·87	22·78	$C = 43° 0' 23''·05$
VIII (Chĕndamangalam) and VI (Kallapat)	h 8·85	l 10·80	l 10·26	l 10·03	l 9·54	l 9·73	h 10·10	l 9·89	l 8·79	l 10·38	$M = 9''·91$
	h 9·85	l 10·16	l 10·05	l 10·10	l 9·27	l 10·17	h 9·75	l 11·01	l 9·19	l 10·73	$w = 45·50$
	h 9·18	l 9·85	l 10·47	l 9·85	l 9·60	l 10·12	h 9·64	l 10·03	l 9·84	l 10·21	$\frac{1}{w} = 0·02$
	9·29	10·27	10·26	9·99	9·47	10·01	9·83	10·31	9·27	10·44	$C = 72° 9' 9''·91$

At XI (Ulundúrpet)

February 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on IX (Kiliyúr) 0° 1′	180° 0′	79° 12′	259° 11′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
IX (Kiliyúr) and VIII (Chĕndamangalam)	″ h 57·74	″ l 58·35	″ l 58·34	″ l 57·88	″ l 57·50	″ l 58·05	″ l 56·83	″ l 57·52	″ l 57·61	″ l 55·56	$M = 57''·63$
	h 58·08	l 58·00	l 58·37	l 58·07	l 58·70	l 58·01	l 57·80	l 57·32	l 57·68	l 55·97	$w = 20·85$
	h 58·80	l 57·93	l 57·93	l 57·10	l 57·30	l 57·88	l 58·31	h 56·62	l 57·05	l 56·16	$\frac{1}{w} = 0·05$
										l 56·48	
	58·21	58·09	58·21	57·68	57·83	57·98	57·65	57·15	57·45	56·04	$C = 74° 42' 57''·63$
VIII (Chĕndamangalam) and XII (Koilánkuppam)	h 34·13	l 33·80	l 33·12	l 34·67	l 32·76	l 33·39	l 33·12	l 33·96	l 32·93	l 34·34	$M = 33''·57$
	h 33·34	l 34·47	l 33·84	l 34·69	l 31·78	l 33·52	l 33·09	l 33·50	l 32·72	l 33·18	$w = 22·81$
	h 33·78	l 33·98	l 33·11	h 33·70	l 33·27	l 33·67	l 32·62	h 35·47	l 33·17	l 33·88	$\frac{1}{w} = 0·04$
										l 34·08	
	33·75	34·08	33·36	34·35	32·60	33·53	32·94	34·31	32·94	33·87	$C = 55° 59' 33''·57$

At XI (Ulundúrpet)—(*Continued*).

Angle between	Circle readings, telescope being set on IX (Kiliyúr) 0° 1′	180° 0′	79° 12′	259° 11′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XII (Koilánkuppam) and XIV (Kánádakŏndán)	h 17·67	l 18·57	l 19·08	l 17·83	l 18·91	l 18·03	l 19·67	l 17·98	l 18·52	l 17·50	$M = 18''\cdot 39$
	h 17·95	l 18·43	l 18·70	l 17·76	l 18·95	l 18·03	l 19·46	l 18·23	l 19·38	l 18·15	$w = 20\cdot 04$
	h 17·54	l 18·30	l 18·94	h 17·92	l 18·72	l 17·98	l 19·69	h 17·54	l 19·35	l 17·31	$\frac{1}{w} = 0\cdot 05$
										l 17·22	
	17·72	18·43	18·91	17·84	18·86	18·01	19·61	17·92	19·08	17·55	$C = 34^\circ\ 26'\ 18''\cdot 39$

At XII (Koilánkuppam)

February 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIV (Kánádakŏndán) 0° 1′	180° 0′	79° 13′	259° 12′	158° 25′	338° 24′	237° 37′	57° 36′	316° 49′	136° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XIV (Kánádakŏndán) and XI (Ulundúrpet)	h 21·09	l 20·96	l 18·51	h 21·55	l 20·40	l 19·90	l 20·23	h 19·11	l 21·45	l 20·03	$M = 20''\cdot 57$
	l 20·11	l 21·30	l 20·62	h 20·05	l 20·24	l 20·88	l 20·03	h 19·97	l 21·70	l 21·57	$w = 16\cdot 70$
	l 21·16	l 20·55	h 20·14	h 21·45	l 20·87	l 19·77	h 21·87	h 19·35	l 22·56	l 19·65	$\frac{1}{w} = 0\cdot 06$
	20·79	20·94	19·76	21·02	20·50	20·18	20·71	19·48	21·90	20·42	$C = 81^\circ\ 46'\ 20''\cdot 57$
XI (Ulundúrpet) and VIII (Chĕndamangalam)	h 27·75	l 28·28	l 29·08	h 28·47	l 27·34	l 29·64	l 28·35	h 30·48	l 27·22	l 28·47	$M = 28''\cdot 43$
	l 29·15	l 27·79	l 27·58	h 28·18	l 27·74	l 28·78	l 28·62	h 28·95	l 27·01	l 27·76	$w = 15\cdot 45$
	l 29·22	l 27·74	h 28·99	h 28·74	l 28·36	l 29·26	h 26·78	h 29·87	l 27·09	l 29·30	$\frac{1}{w} = 0\cdot 06$
							h 29·04				
	28·71	27·94	28·55	28·46	27·81	29·23	28·20	29·77	27·11	28·51	$C = 50^\circ\ 31'\ 28''\cdot 43$
VIII (Chĕndamangalam) and X (Vallam)	h 19·77	l 19·98	l 21·01	h 19·71	l 20·88	l 19·52	l 20·28	h 19·91	l 21·04	l 21·18	$M = 20''\cdot 22$
	l 18·90	l 20·54	l 21·59	h 19·79	l 20·38	l 18·28	l 20·10	h 19·28	l 20·62	l 21·93	$w = 13\cdot 70$
	l 18·63	l 20·80	h 20·26	h 19·60	l 19·48	l 19·72	h 21·25	h 19·43	l 21·48	l 21·24	$\frac{1}{w} = 0\cdot 07$
	19·10	20·44	20·95	19·70	20·25	19·17	20·54	19·54	21·05	21·45	$C = 87^\circ\ 49'\ 20''\cdot 22$
X (Vallam) and XIII (Seppalánattam)	h 8·60	l 8·34	l 7·47	h 9·61	l 8·91	l 8·58	l 7·54	h 8·76	l 9·25	l 8·82	$M = 8''\cdot 53$
	l 8·68	l 9·21	l 6·56	h 8·86	l 8·47	l 9·64	l 8·01	h 9·30	l 7·67	l 7·72	$w = 22\cdot 70$
	l 8·76	l 8·67	h 7·90	h 9·03	l 9·17	l 9·14	h 8·13	h 9·18	l 8·26	l 7·53	$\frac{1}{w} = 0\cdot 04$
	8·68	8·74	7·31	9·17	8·85	9·12	7·89	9·08	8·39	8·02	$C = 50^\circ\ 9'\ 8''\cdot 53$
XIII (Seppalánattam) and XIV (Kánádakŏndán)	l 41·94	l 42·30	l 43·40	h 42·07	l 42·64	l 42·44	l 44·52	h 41·85	l 41·10	l 41·02	$M = 42''\cdot 15$
	l 42·17	l 41·81	l 44·13	h 41·61	l 42·58	l 42·29	l 43·07	h 41·04	l 42·18	l 41·05	$w = 13\cdot 70$
	l 43·11	l 41·52	h 42·78	h 42·24	l 42·90	l 41·27	h 41·47	h 42·84	l 41·12	l 40·13	$\frac{1}{w} = 0\cdot 07$
	42·41	41·88	43·44	41·97	42·71	42·00	43·02	41·91	41·47	40·73	$C = 89^\circ\ 43'\ 42''\cdot 15$

At XIII (Seppalánattam)

February 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XV (Pŏdaiyúr) 178° 10′	358° 9′	257° 22′	77° 21′	336° 34′	156° 33′	55° 46′	235° 45′	134° 58′	314° 57′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XV (Pŏdaiyúr) and XVI (Ayyampet)	h 32·02	l 30·82	l 31·96	l 31·64	l 30·87	l 30·61	l 31·64	l 30·93	l 29·16	l 31·77	$M = 31''\cdot18$
	h 31·26	l 29·76	l 32·25	h 33·50	l 30·01	h 30·08	l 31·99	h 32·66	l 30·38	l 30·49	$w = 15\cdot90$
	l 30·73	l 31·63	l 31·99	h 31·37	l 30·88	h 30·40	l 30·92	h 30·96	l 30·73	l 32·05	$\frac{1}{w} = 0\cdot06$
	31·34	30·74	32·07	32·17	30·59	30·36	31·52	31·52	30·09	31·44	$C = 29^\circ 52' 31''\cdot18$
XVI (Ayyampet) and XIV (Kánádakŏndán)	h 54·41	l 56·35	l 54·98	l 54·66	l 56·47	l 56·66	l 54·25	l 55·78	l 56·54	l 55·56	$M = 55''\cdot79$
	h 56·24	l 57·70	l 54·97	h 54·62	l 56·69	h 56·74	l 55·06	h 54·53	l 57·49	l 55·96	$w = 17\cdot20$
	l 55·63	l 55·88	l 55·29	h 56·34	l 56·43	h 56·20	l 55·68	h 55·32	l 55·34	l 55·82	$\frac{1}{w} = 0\cdot06$
	55·43	56·64	55·08	55·21	56·53	56·53	55·00	55·21	56·46	55·78	$C = 62^\circ 26' 55''\cdot79$
XIV (Kánádakŏndán) and XII (Koilánkuppam)	h 8·17	l 10·05	l 9·59	l 10·60	l 10·80	l 9·45	l 10·82	l 9·01	l 10·50	l 9·18	$M = 9''\cdot79$
	h 9·33	l 9·89	l 9·77	h 9·80	l 11·09	h 8·65	l 10·54	h 9·80	l 9·42	l 8·82	$w = 27\cdot80$
	l 10·12	l 10·61	l 9·72	h 9·38	l 9·93	h 9·83	l 9·43	h 9·48	l 10·70	l 9·10	$\frac{1}{w} = 0\cdot04$
	9·21	10·18	9·69	9·93	10·61	9·31	10·26	9·43	10·21	9·03	$C = 29^\circ 41' 9''\cdot79$
XII (Koilánkuppam) and X (Vallam)	h 31·36	l 29·49	l 30·69	l 30·78	l 29·64	l 30·97	l 31·79	l 31·47	l 29·97	l 31·39	$M = 30''\cdot58$
	h 31·07	l 29·21	l 31·15	h 30·16	l 31·05	h 29·17	l 30·58	h 29·38	l 29·93	l 31·15	$w = 21\cdot70$
	l 30·12	l 29·55	l 32·05	h 30·14	l 30·59	h 31·11	l 31·69	h 30·08	l 30·60	l 31·03	$\frac{1}{w} = 0\cdot05$
	30·85	29·42	31·30	30·36	30·43	30·42	31·35	30·31	30·17	31·19	$C = 56^\circ 8' 30''\cdot58$

At XIV (Kánádakŏndán)

February 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XI (Ulundúrpet) 194° 34′	14° 33′	273° 45′	93° 45′	352° 57′	172° 56′	72° 9′	252° 9′	151° 21′	331° 20′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XI (Ulundúrpet) and XII (Koilánkuppam)	h 21·10	h 20·16	l 21·44	l 21·91	h 20·85	l 20·23	l 20·36	l 20·61	h 22·52	l 22·39	$M = 21''\cdot25$
	h 20·66	l 21·14	l 22·90	l 21·15	h 19·46	l 20·30	l 20·04	h 21·48	l 22·77	l 22·80	$w = 10\cdot30$
	h 20·96	l 20·29	l 21·78	h 21·85	l 21·03	l 20·79	l 19·94	h 20·96	l 22·51	l 23·19	$\frac{1}{w} = 0\cdot10$
	20·91	20·53	22·04	21·64	20·45	20·44	20·11	21·02	22·60	22·79	$C = 63^\circ 47' 21''\cdot25$

At XIV (Kánádakŏndán)—(*Continued*).

Angle between	Circle readings, telescope being set on XI (Ulundúrpet) 194° 34′	14° 33′	273° 45′	93° 45′	352° 57′	172° 56′	72° 9′	252° 9′	151° 21′	331° 20′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XII (Koilánkuppam) and XIII (Seppalánattam)	h 8·70 h 7·81 h 7·68	h 7·21 l 7·61 l 7·76	l 6·55 l 6·79 l 7·17	l 7·48 l 7·26 h 7·76	h 8·24 h 9·15 l 8·70	l 8·56 l 8·82 l 8·72	l 7·84 l 8·09 l 8·78	l 8·43 h 8·35 h 7·02	h 7·22 l 8·36 l 6·81	l 8·33 l 8·79 l 8·56	$M = 7''\cdot95$ $w = 23\cdot30$ $\frac{1}{w} = 0\cdot04$ $C = 60°\ 35'\ 7''\cdot95$
	8·06	7·53	6·84	7·50	8·70	8·70	8·24	7·93	7·46	8·56	
XIII (Seppalánattam) and XV (Pŏdaiyúr)	h 35·55 h 36·98 h 36·15	h 36·59 l 36·91 l 36·05	l 34·62 l 33·21 l 33·12	l 36·45 l 35·96 h 36·91	h 34·54 h 34·41 l 34·99	l 35·94 l 35·20 l 34·81	l 34·99 l 35·18 l 34·91	l 34·58 h 36·03 h 35·68	h 34·44 l 33·75 l 34·53	l 35·00 l 33·96 l 34·33	$M = 35''\cdot19$ $w = 9\cdot70$ $\frac{1}{w} = 0\cdot10$ $C = 47°\ 22'\ 35''\cdot19$
	36·23	36·52	33·65	36·44	34·65	35·32	35·03	35·43	34·24	34·43	
XV (Pŏdaiyúr) and XVI (Ayyampet)	h 58·56 h 58·25 h 59·19	h 57·85 l 56·15 l 57·41	l 61·23 l 61·39 l 60·86	l 59·07 l 59·10 h 59·56	h 59·82 h 59·94 l 59·46	l 58·89 l 58·69 l 58·65	l 60·04 l 58·82 l 59·64	l 58·54 h 57·71 h 59·07	h 58·62 l 58·30 l 58·44	l 59·07 l 59·92 l 59·53	$M = 59''\cdot06$ $w = 8\cdot60$ $\frac{1}{w} = 0\cdot12$ $C = 22°\ 46'\ 59''\cdot06$
	58·67	57·14	61·16	59·24	59·74	58·74	59·50	58·44	58·45	59·51	

At XV (Pŏdaiyúr)

January 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XVIII (Kuchúr) 0° 1′	180° 1′	79° 13′	259° 12′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XVIII (Kuchúr) and XVII (Salpai)	l 53·07 l 54·87 l 51·96 h 53·11	l 53·80 l 54·65 l 53·83	h 51·83 h 52·43 h 53·14	h 54·43 l 54·81 l 53·33	l 54·32 l 53·03 l 51·98	l 54·56 l 55·30 l 53·26	h 54·00 h 52·97 h 55·23	h 53·80 h 52·90 h 54·00	l 53·94 l 53·60 l 54·53	l 52·29 l 52·96 l 53·44	$M = 53''\cdot60$ $w = 17\cdot03$ $\frac{1}{w} = 0\cdot06$ $C = 46°\ 28'\ 53''\cdot60$
	53·25	54·09	52·47	54·19	53·11	54·37	54·07	53·57	54·02	52·90	
XVII (Salpai) and XVI (Ayyampet)	l 46·07 l 43·80 l 46·55 h 45·17	l 45·91 l 45·47 l 46·39	h 45·98 h 45·41 h 45·29	h 44·41 l 45·45 l 46·92	l 44·23 l 45·46 l 45·78	l 46·77 l 45·57 l 47·04	h 46·02 h 46·19 h 46·16	h 44·92 h 43·99 h 44·63	l 45·91 l 45·11 l 43·36	l 45·08 l 45·61 l 45·29	$M = 45''\cdot48$ $w = 19\cdot77$ $\frac{1}{w} = 0\cdot05$ $C = 59°\ 48'\ 45''\cdot48$
	45·40	45·92	45·56	45·59	45·16	46·46	46·12	44·51	44·79	45·33	

At XV (Pŏdaiyúr)—(*Continued*).

Angle between	Circle readings, telescope being set on XVIII (Kuchúr) 0° 1′	180° 1′	79° 13′	259° 12′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XVI (Ayyampet) and XIV (Kánádakŏndán)	l 7·74	l 6·89	h 4·63	h 6·45	l 7·53	l 5·05	h 6·81	h 5·61	l 6·99	l 7·16	$M = 6''·42$
	l 7·27	l 6·06	h 6·90	l 5·79	l 7·19	l 5·21	h 6·50	h 5·60	l 6·42	l 6·93	$w = 16·16$
	l 6·85	l 5·74	h 6·74	l 4·60	l 7·08	l 5·33	h 6·52	h 6·36	l 6·79	l 7·65	$\frac{1}{w} = 0·06$
			h 6·36								
	7·29	6·23	6·16	5·61	7·27	5·20	6·61	5·86	6·73	7·25	$C = 47° 3' 6''·42$
XIV (Kánádakŏndán) and XIII (Seppalánattam)	l 59·05	l 57·92	h 59·11	h 59·38	l 57·93	l 58·73	h 59·02	h 60·05	l 58·62	l 58·78	$M = 58''·67$
	l 59·17	l 59·08	h 58·73	l 58·54	l 58·06	l 59·50	h 57·00	h 57·18	l 57·79	l 59·97	$w = 31·62$
	l 58·92	l 59·30	h 57·84	l 59·10	l 58·27	l 59·06	h 57·43	h 58·82	l 59·67	l 58·23	$\frac{1}{w} = 0·03$
								h 58·49			
	59·05	58·77	58·56	59·01	58·09	59·10	57·82	58·64	58·69	58·99	$C = 40° 17' 58''·67$

At XVI (Ayyampet)

January 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIV (Kánádakŏndán) 0° 1′	180° 1′	79° 13′	259° 12′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XIV (Kánádakŏndán) and XIII (Seppalánattam)	h 31·61	l 30·18	l 30·08	h 30·40	l 30·17	l 31·17	l 30·48	l 33·34	l 29·97	l 30·51	$M = 30''·80$
	h 30·55	l 30·97	h 31·46	h 30·91	l 29·71	l 32·00	l 30·02	l 31·57	l 30·51	l 29·89	$w = 16·26$
	l 30·45	l 30·22	h 30·08	h 32·39	l 29·95	l 31·16	l 29·90	l 32·19	l 31·79	l 30·83	$\frac{1}{w} = 0·06$
	l 29·81		l 31·07								
	30·61	30·46	30·67	31·23	29·94	31·44	30·13	32·37	30·76	30·41	$C = 47° 23' 30''·80$
XIII (Seppalánattam) and XV (Pŏdaiyúr)	h 25·32	l 27·12	l 25·29	h 26·63	l 25·43	l 25·87	l 25·34	l 23·93	l 26·65	l 25·53	$M = 25''·55$
	h 24·72	l 24·10	h 25·56	h 25·22	l 25·34	l 26·40	l 26·34	l 24·02	l 26·48	l 25·42	$w = 20·40$
	l 25·10	l 25·78	l 24·54	h 25·01	l 25·98	l 26·13	l 26·41	l 24·84	l 26·28	l 25·70	$\frac{1}{w} = 0·05$
	25·05	25·67	25·13	25·62	25·58	26·13	26·03	24·26	26·47	25·55	$C = 62° 46' 25''·55$
XV (Pŏdaiyúr) and XVII (Salpai)	h 37·57	l 35·75	l 35·33	h 37·35	l 36·42	l 35·62	l 37·33	l 38·70	l 37·89	l 37·02	$M = 37''·08$
	h 37·74	l 38·52	h 35·96	h 35·34	l 36·74	l 36·07	l 37·42	l 38·90	l 37·27	l 38·66	$w = 12·20$
	l 37·21	l 37·01	l 36·79	h 37·14	l 36·97	l 35·73	l 36·70	l 38·43	l 37·51	l 37·34	$\frac{1}{w} = 0·08$
	37·51	37·09	36·03	36·61	36·71	35·81	37·15	38·68	37·56	37·67	$C = 71° 31' 37''·08$

At XVI (Ayyampet)—(*Continued*).

Angle between	Circle readings, telescope being set on XIV (Kánádakŏndán) 0° 1′	180° 1′	79° 13′	259° 12′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVII (Salpai) and XIX (Kulattúr)	″ h 7·64 h 6·83 l 6·58	″ l 6·88 l 5·73 l 6·79	″ l 7·57 h 6·69 h 7·97 l 7·82	″ h 6·99 h 6·56 h 7·81	″ l 7·87 l 7·58 l 6·77	″ l 5·49 l 6·17 l 6·13	″ l 6·48 l 5·71 l 6·37	″ l 6·37 l 5·60 l 5·93	″ l 5·77 l 6·62 l 5·96	″ l 6·40 l 6·01 l 6·35	$M = 6''\cdot60$ $w = 23\cdot35$ $\frac{1}{w} = 0\cdot04$ $C = 56° 56' 6''\cdot60$
	7·02	6·47	7·51	7·12	7·41	5·93	6·19	5·97	6·12	6·25	

At XVII (Salpai)

January 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XV (Pŏdaiyúr) 0° 1′	180° 0′	79° 13′	259° 13′	158° 25′	338° 24′	237° 37′	57° 36′	316° 49′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XV (Pŏdaiyúr) and XVIII (Kuchúr)	″ l 32·83 l 32·24 l 30·79	″ l 32·75 l 32·44 l 31·43	″ h 31·64 h 32·72 l 30·93	″ l 32·28 l 32·94 l 33·11	″ h 32·53 l 32·91 l 32·67	″ l 31·91 l 30·85 l 32·41	″ h 32·43 h 33·19 h 34·16	″ l 32·30 l 33·89 l 32·88	″ h 33·09 h 31·99 h 34·26	″ h 32·27 h 32·06 l 33·76	$M = 32''\cdot52$ $w = 20\cdot80$ $\frac{1}{w} = 0\cdot05$ $C = 71° 9' 32''\cdot52$
	31·95	32·21	31·76	32·78	32·70	31·72	33·26	33·02	33·11	32·70	
XVIII (Kuchúr) and XXI (Tirupanandál Mandap)	l 15·06 l 15·62 l 15·81	l 14·92 l 14·36 l 15·38	h 14·91 h 12·86 l 13·06	l 12·33 l 12·99 l 12·53	h 14·22 l 13·36 l 13·12	l 14·40 l 14·84 l 12·88	h 15·57 h 13·64 l 12·94	l 12·67 l 14·58 l 13·12	h 13·21 h 14·06 h 13·12	h 13·32 h 13·20 l 12·66	$M = 13''\cdot83$ $w = 11\cdot50$ $\frac{1}{w} = 0\cdot09$ $C = 70° 21' 13''\cdot83$
	15·50	14·89	13·61	12·62	13·57	14·04	14·05	13·46	13·46	13·06	
XXI (Tirupanandál Mandap) and XXII (Nayinipiriyán)	l 51·39 l 48·41 l 49·49 l 49·12	l 51·09 l 50·50 l 51·29	h 49·16 h 49·47 l 50·41	l 51·46 l 50·13 l 49·21 h 50·88	h 49·24 l 49·27 l 49·83	l 49·02 l 48·89 l 51·52	h 49·50 h 49·84 l 50·90	l 51·16 l 50·52 l 50·77	h 50·58 h 49·84 h 51·92	h 50·16 h 50·69 l 50·03	$M = 50''\cdot19$ $w = 20\cdot86$ $\frac{1}{w} = 0\cdot05$ $C = 42° 49' 50''\cdot19$
	49·60	50·96	49·68	50·42	49·45	49·81	50·08	50·82	50·78	50·29	
XXII (Nayinipiriyán) and XX (Kachipĕrumál)	l 0·17 l 4·02 l 1·98 l 2·67	l 1·73 l 2·54 l 1·50	h 3·33 h 2·58 l 2·32	l 1·20 l 3·05 h 2·35	h 2·92 l 4·15 l 3·50	l 2·87 l 3·34 l 1·97	h 1·75 h 2·91 h 1·55	l 1·92 l 1·81 l 1·37	h 1·48 h 3·13 h 0·79	h 2·01 h 2·18 l 2·48	$M = 2''\cdot31$ $w = 20\cdot99$ $\frac{1}{w} = 0\cdot05$ $C = 31° 40' 2''\cdot31$
	2·21	1·92	2·74	2·20	3·52	2·73	2·07	1·70	1·80	2·22	

At XVII (Salpai)—(*Continued*).

Angle between	Circle readings, telescope being set on XV (Pŏdaiyúr) 0°1′	180°0′	79°13′	259°13′	158°25′	338°24′	237°37′	57°36′	316°49′	136°48′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XX (Kachipĕrumál) and XIX (Kulattúr)	l 8·80	l 9·08	h 6·85	l 9·57	h 7·85	l 8·90	h 7·38	l 7·28	h 8·45	h 7·47	$M = 8''\cdot07$
	l 7·17	l 8·53	h 8·26	l 8·01	l 6·98	l 8·70	h 6·90	l 7·92	h 8·68	h 7·51	$w = 23\cdot80$
	l 8·38	l 9·29	l 6·98	h 8·68	l 7·89	l 8·39	h 8·88	l 8·67	h 6·95	l 7·71	$\frac{1}{w} = 0\cdot04$
	8·12	8·97	7·36	8·75	7·57	8·66	7·72	7·96	8·03	7·56	$C = 38°\,31'\,8''\cdot07$
XIX (Kulattúr) and XVI (Ayyampet)	l 35·58	l 36·93	h 36·93	l 36·21	h 36·03	l 36·90	h 36·16	l 36·48	h 35·47	h 35·39	$M = 36''\cdot38$
	l 36·55	l 37·36	h 36·61	l 37·10	l 37·32	l 35·57	h 35·41	l 36·21	h 35·60	h 35·32	$w = 29\cdot40$
	l 36·00	l 37·40	l 37·27	l 35·27	l 36·76	l 37·57	h 37·26	l 35·61	h 36·63	l 36·52	$\frac{1}{w} = 0\cdot03$
	36·04	37·23	36·94	36·19	36·70	36·68	36·28	36·10	35·90	35·74	$C = 56°\,48'\,36''\cdot38$
XVI (Ayyampet) and XV (Pŏdaiyúr)	l 36·60	l 34·83	h 37·63	l 35·82	h 36·88	l 35·99	h 36·92	l 37·31	h 36·12	h 38·19	$M = 36''\cdot41$
	l 35·83	l 34·95	h 36·79	l 36·20	l 34·56	l 37·00	h 37·10	l 35·38	h 36·70	h 38·79	$w = 11\cdot50$
	l 36·76	l 35·39	l 37·65	l 34·55	l 35·45	l 36·38	h 36·21	l 36·72	h 36·58	l 37·09	$\frac{1}{w} = 0\cdot09$
	36·40	35·06	37·36	35·52	35·63	36·46	36·74	36·47	36·47	38·02	$C = 48°\,39'\,36''\cdot41$

At XVIII (Kuchúr)

January 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXI (Tirupanandál Mandap) 132°3′	312°3′	211°16′	31°16′	290°31′	110°30′	9°40′	189°40′	88°52′	268°51′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXI (Tirupanandál Mandap) and XVII (Salpai)	h 20·55	h 19·01	l 19·57	l 19·85	l 21·73	l 21·06	l 20·36	l 21·36	l 23·24	l 21·11	$M = 20''\cdot66$
	h 19·51	h 19·97	l 19·09	l 18·43	l 20·59	l 21·44	h 21·76	l 21·21	l 22·29	l 21·31	$w = 8\cdot82$
	h 18·71	h 20·26	l 20·43	l 20·11	l 19·22	l 21·66	l 21·26	l 21·38	l 21·93	l 21·37	$\frac{1}{w} = 0\cdot11$
							l 20·98				
	19·59	19·75	19·70	19·46	20·51	21·39	21·09	21·32	22·49	21·26	$C = 69°\,41'\,20''\cdot66$
XVII (Salpai) and XV (Pŏdaiyúr)	h 32·91	h 34·61	l 34·66	l 36·24	l 34·30	l 34·56	l 33·57	l 33·92	l 33·64	l 34·74	$M = 34''\cdot60$
	h 34·73	h 35·35	l 36·66	l 35·04	l 34·07	l 34·21	l 35·23	l 33·88	l 33·92	l 35·59	$w = 18\cdot90$
	h 34·77	h 34·20	l 34·81	l 35·82	l 35·86	l 33·62	l 33·22	l 35·08	l 33·94	l 34·71	$\frac{1}{w} = 0\cdot05$
	34·14	34·72	35·38	35·70	34·74	34·13	34·01	34·29	33·83	35·01	$C = 62°\,21'\,34''\cdot60$

At XIX (Kulattúr)

December 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XVI (Ayyampet) 154° 56′	334° 56′	234° 8′	54° 7′	313° 20′	133° 19′	32° 32′	212° 32′	111° 45′	291° 44′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVI (Ayyampet) and XVII (Salpai)	″ l 14·76 l 15·73 l 17·59 l 16·77	″ l 17·02 l 18·14 l 16·29 l 16·72	″ l 15·02 l 14·63 l 15·77	″ l 17·64 l 17·62 l 17·34 l 17·25	″ l 15·34 l 15·52 l 15·91	″ l 16·42 l 16·49 l 16·55	″ l 15·35 l 16·85 l 15·94	″ l 15·90 l 15·53 l 15·85	″ h 18·01 h 16·47 l 16·62 l 17·60	″ l 16·86 l 16·60 l 16·08	M = 16″·34 w = 15 ·48 $\frac{1}{w}$ = 0 ·06 C = 66° 15′ 16″·35
	16·21	17·04	15·14	17·46	15·59	16·49	16·05	15·76	17·18	16·51	
XVII (Salpai) and XX (Kachipĕrumál)	l 57·39 l 58·04 l 57·42 l 57·66	l 56·07 l 53·64 l 56·79 l 56·32	l 58·68 l 57·69 l 56·46	l 57·32 l 55·84 l 56·35 l 57·23	l 59·60 l 58·60 l 58·43 l 54·20 l 57·22	l 56·12 l 57·29 l 55·16	l 58·07 l 57·33 l 57·25	l 56·87 l 56·15 l 57·02	h 57·07 h 54·96 l 56·61	l 58·51 l 57·06 l 57·46	M = 56″·96 w = 11 ·67 $\frac{1}{w}$ = 0 ·09 C = 88° 39′ 56″·96
	57·63	55·71	57·61	56·69	57·61	56·19	57·55	56·68	56·21	57·68	

At XX (Kachipĕrumál)

December 1878 *and January* 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIX (Kulattúr) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XIX (Kulattúr) and XVII (Salpai)	″ l 56·33 l 56·26 l 55·05	″ l 55·43 l 57·99 l 57·71	″ l 55·43 l 56·29 l 56·87	″ l 56·65 l 57·24 h 57·78	″ l 57·38 l 56·18 l 54·81	″ l 58·20 l 56·74 l 57·31	″ l 56·07 l 54·62 l 57·80	″ l 57·95 h 57·18 h 56·61	″ h 56·56 h 56·62 h 56·53	″ l 58·03 l 58·84 l 57·80	M = 56″·81 w = 13 ·30 $\frac{1}{w}$ = 0 ·08 C = 52° 48′ 56″·81
	55·88	57·04	56·20	57·22	56·12	57·42	56·16	57·25	56·57	58·22	
XVII (Salpai) and XXII (Nayinipiriyán)	l 5·10 l 3·96 l 6·01	l 3·57 l 3·58 l 4·09	l 4·75 l 3·87 l 3·10	l 2·03 l 0·57 h 2·88 h 2·52	l 3·86 l 3·85 l 6·14 l 4·99	l 4·53 l 5·22 l 4·75	l 3·79 l 6·06 l 5·46	l 3·56 h 3·60 h 3·40	h 2·82 h 3·80 l 3·60	l 2·81 l 2·96 l 3·18	M = 3″·92 w = 8 ·66 $\frac{1}{w}$ = 0 ·12 C = 82° 48′ 3″·92
	5·02	3·75	3·91	2·00	4·71	4·83	5·10	3·52	3·41	2·98	

At XXI (Tirupanandál Mandap)

March 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXIV (Putagaram) 0° 6′	180° 6′	79° 16′	259° 16′	158° 25′	338° 25′	237° 38′	57° 38′	316° 51′	186° 51′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXIV (Putagaram) and XXIII (Kumbakonam)	″ h 44·98 h 43·44 l 42·16	″ l 45·47 l 44·31 l 45·13	″ l 43·97 l 43·61 h 42·87	″ h 42·57 h 41·47 l 43·06	″ l 42·72 l 45·48 l 43·52	″ l 43·66 l 42·29 h 41;82	″ h 42·88 h 45·36 h 43·89	″ h 43·65 h 43·45 h 43·39	″ l 44·75 l 44·54 l 43·14	″ l 43·06 l 43·50 l 43·62	$M = 43''\cdot59$ $w = 13\cdot20$ $\frac{1}{w} = 0\cdot08$ $C = 40^\circ 45' 43''\cdot59$
	43·53	44·97	43·48	42·37	43·91	42·59	44·04	43·50	44·14	43·39	
XXIII (Kumbakonam) and XXII (Nayinipiriyán)	h 21·71 h 20·76 l 20·41	l 20·31 l 20·05 l 21·76	l 21·65 l 21·58 h 20·70	h 22·32 h 21·69 l 21·30	l 21·41 l 22·58 l 21·80.	l 19·80 l 18·93 h 20·11	h 20·32 h 21·87 h 21·75	h 20·05 h 20·29 h 20·69	l 20·41 l 19·33 l 21·03	l 21·28 l 20·55 l 21·56	$M = 20''\cdot93$ $w = 16\cdot40$ $\frac{1}{w} = 0\cdot06$ $C = 80^\circ 46' 20''\cdot93$
	20·96	20·71	21·31	21·77	21·93	19·61	21·31	20·34	20·26	21·13	
XXII (Nayinipiriyán) and XVII (Salpai)	h 28·08 h 29·69 l 30·23	l 32·42 l 30·59 l 31·93	l 30·39 l 29·35 h 28·93	h 31·36 h 32·14 l 30·52	l 30·66 l 30·41 l 29·77	l 30·55 l 31·31 l 30·92 h 30·98	h 31·39 h 30·17 h 28·87	h 31·01 h 29·77 h 30·64	l 30·83 l 29·95 l 30·69	l 31·53 l 29·32 l 29·62	$M = 30''\cdot44$ $w = 14\cdot79$ $\frac{1}{w} = 0\cdot07$ $C = 65^\circ 12' 30''\cdot44$
	29·33	31·65	29·56	31·34	30·28	30·94	30·14	30·47	30·49	30·16	
XVII (Salpai) and XVIII (Kuchúr)	h 26·28 h 28·73 l 27·91	l 26·45 l 27·12 l 26·92	l 28·32 l 27·00 h 28·13	h 29·61 h 31·19 l 28·67	l 27·79- l 28·94 l 27·70	l 30·39 l 29·91 h 29·83	h 30·01 h 29·03 h 27·96	h 27·37 h 28 15 h 27·43	l 29·39 l 29·34 l 29·06	l 28·45 l 27·05 l 28·53	$M = 28''\cdot42$ $w = 7\cdot90$ $\frac{1}{w} = 0\cdot13$ $C = 39^\circ 57' 28''\cdot42$
	27·64	26·83	27·82	29·82	28·14	30·04	29·00	27·65	29·26	28·01	

At XXII (Nayinipiriyán)

**March* 1878; *and* †*January* 1879; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XX (Kachipĕrumál) 247° 5′	67° 5′	326° 18′	146° 18′	45° 19′	225° 19′	124° 32′	304° 31′	203° 43′	23° 43′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
† XX (Kachipĕrumál) and XVII (Salpai)	″ l 52·69 l 51·78 h 51·82	″ l 53·85 l 52·76 h 53·04	″ h 53·47 h 50·65 h 52·33	″ h 52·71 h 52·89 h 52·63	″ h 50·18 h 53·98 h 52·33	″ h 52·93 h 52·73 h 52·75	″ h 52·59 h 52·41 h 52·70	″ h 50·32 h 51·82 h 51·46	″ h 50·79 h 53·41 h 51·09	″ h 51·70 h 51·90 h 50·88	$M = 52''\cdot22$ $w = 16\cdot70$ $\frac{1}{w} = 0\cdot06$ $C = 65^\circ 31' 52''\cdot22$
	52·10	53·22	52·15	52·74	52·16	52·80	52·57	51·20	51·76	51·49	

At XXII (Nayinipiriyán)—(*Continued*).

Angle between	Circle readings, telescope being set on XX (Kachipĕrumál) 247° 5′	67° 5′	326° 18′	146° 18′	45° 19′	225° 19′	124° 32′	304° 31′	203° 43′	23° 43′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XVII (Salpai) and XXI (Tirupanandál Mandap)	″ l 35·49 l 37·25 h 38·43	″ l 36·50 l 38·02 h 37·78	″ h 38·52 h 39·75 h 40·20	″ h 38·13 h 41·19 h 40·11	″ h 40·89 h 36·43 h 38·89 h 38·09	″ h 38·79 h 38·26 h 37·72	″ h 38·80 h 39·50 h 39·90	″ h 38·32 h 38·97 h 38·44	″ h 38·96 h 37·86 h 38·91	″ h 39·66 h 39·28 h 39·64	$M = 38''·67$ $w = 9·05$ $\frac{1}{w} = 0·11$
	37·06	37·43	39·49	39·81	38·58	38·26	39·40	38·58	38·58	39·53	$C = 71° 57' 38''·67$
* XXI (Tirupanandál Mandap) and XXIII (Kumbakonam)	h 13·56 h 14·24 h 13·72	h 11·40 h 10·69 h 10·95	l 14·24 l 13·59 l 14·34	l 10·88 l 11·98 l 13·26	l 10·90 l 12·86 l 11·33	l 12·25 l 10·02 l 11·10	h 12·84 h 11·25 h 10·05	h 12·64 h 10·31 h 13·33	l 9·64 l 11·48 l 11·30 l 11·26	l 10·42 l 10·33 l 11·92	$M = 11''·91$ $w = 6·32$ $\frac{1}{w} = 0·16$
	13·84	11·01	14·06	12·04	11·70	11·12	11·38	12·09	10·92	10·89	$C = 57° 4' 11''·91$
* XXIII (Kumbakonam) and XXV (Mutuváncheri)	h 50·58 h 53·42 h 53·20	h 50·80 h 52·46 h 51·05	l 54·59 l 54·30 l 55·16	l 52·11 l 51·37 l 51·68	l 55·19 l 55·18 l 54·85	l 52·22 l 54·30 l 51·92	h 54·71 h 52·28 h 54·59	h 53·80 h 54·32 h 54·57	l 56·42 l 52·48 l 53·58 l 53·38	l 50·94 l 54·06 l 53·38 l 54·37	$M = 53''·34$ $w = 5·44$ $\frac{1}{w} = 0·18$
	52·40	51·44	54·68	51·72	55·07	52·81	53·86	54·23	53·97	53·19	$C = 52° 24' 53''·34$

At XXIII (Kumbakonam)

***March* 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XXVI (Álangudi) 359° 58′	179° 58′	79° 16′	259° 16′	158° 26′	338° 27′	237° 38′	57° 38′	316° 52′	136° 52′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXVI (Álangudi) and XXVII (Víramangalam)	″ h 3·49 h 3·12 l 4·50	″ l 6·32 l 5·33 l 4·31	″ h 2·93 h 3·76 l 3·36	″ l 3·32 l 1·11 l 4·78 l 3·40	″ h 4·05 h 2·96 l 2·92	″ l 2·58 l 2·98 l 3·28	″ h 3·87 l 1·20 l 3·42 l 5·01	″ l 4·31 l 4·02 l 4·59	″ h 2·52 h 3·09 l 4·28	″ l 3·02 l 3·82 l 3·64	$M = 3''·63$ $w = 14·16$ $\frac{1}{w} = 0·07$
	3·70	5·32	3·35	3·15	3·31	2·95	3·38	4·31	3·30	3·49	$C = 45° 35' 3''·62$
XXVII (Víramangalam) and XXV (Mutuváncheri)	h 36·15 h 35·67 l 35·03	l 33·45 l 33·95 l 34·98	h 35·82 l 36·40 l 37·19 l 35·54	l 35·24 l 36·64 l 34·56 l 34·31	h 36·87 h 35·47 l 37·02	l 33·08 l 33·78 l 32·40	h 36·48 l 37·16 l 36·76 l 37·78	l 35·04 l 34·46 l 34·94	h 34·03 h 32·82 l 34·98	l 33·62 l 34·68 l 35·43	$M = 35''·11$ $w = 5·96$ $\frac{1}{w} = 0·17$
	35·62	34·13	36·24	35·19	36·45	33·09	37·05	34·81	33·94	34·58	$C = 83° 12' 53''·12$

At XXIII (Kumbakonam)—(*Continued*).

Angle between	359° 58′	179° 58′	79° 16′	259° 16′	158° 26′	338° 27′	237° 38′	57° 38′	316° 52′	136° 52′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	Circle readings, telescope being set on XXVI (Álangudi)										
	″	″	″	″	″	″	″	″	″	″	
XXV (Mutuváncheri) and XXII (Nayinipiriyán)	h 54·14	l 56·41	h 53·30	l 54·92	h 53·86	l 54·58	h 55·99	l 56·00	h 57·08	l 54·11	$M = 55''\cdot22$
	h 52·42	l 55·61	l 53·17	l 55·55	h 56·38	l 55·51	l 55·90	l 53·52	h 55·79	l 55·20	$w = 7\cdot28$
	l 54·57	l 56·65	l 54·10	l 57·08	l 55·80	l 55·08	l 56·83	l 54·36	h 57·02	l 55·31	$\frac{1}{w} = 0\cdot14$
			l 53·09	l 56·58	l 54·96		l 56·67				$C = 47°\ 4'\ 55''\cdot22$
	53·71	56·22	53·42	56·03	55·25	55·06	56·35	54·63	56·63	54·87	
XXII (Nayinipiriyán) and XXI (Tirupanandál Mandap)	h 29·85	l 27·87	h 27·48	l 29·66	h 28·56	l 27·27	h 27·47	l 25·67	h 28·32	l 27·74	$M = 27''\cdot59$
	h 29·77	l 29·08	h 29·11	l 27·31	h 27·91	l 27·14	h 27·63	l 26·80	h 27·24	l 26·94	$w = 12\cdot89$
	l 28·10	l 27·71	l 27·50	l 27·82	l 26·48	l 26·97	l 24·89	l 26·12	h 27·08	l 27·39	$\frac{1}{w} = 0\cdot08$
							l 25·09				$C = 42°\ 9'\ 27''\cdot58$
	29·24	28·22	28·03	28·26	27·65	27·13	26·27	26·20	27·55	27·36	
XXI (Tirupanandál Mandap) and XXIV (Putagaram)	h 38·68	l 36·88	h 37·99	l 38·53	h 37·36	l 39·82	h 37·86	l 37·62	h 38·09	l 36·31	$M = 37''\cdot90$
	h 38·32	l 36·87	h 39·80	l 39·11	h 36·16	l 39·38	h 41·05	l 36·94	h 37·48	l 36·06	$w = 7\cdot56$
	l 39·34	l 36·39	l 37·05	l 38·23	l 38·07	l 40·30	l 37·66	l 37·26	h 36·81	l 36·42	$\frac{1}{w} = 0\cdot13$
							l 37·44			l 36·64	$C = 76°\ 3'\ 37''\cdot90$
	38·78	36·71	38·28	38·62	37·20	39·83	38·50	37·27	37·46	36·36	
XXIV (Putagaram) and XXVI (Álangudi)	h 19·39	l 19·84	h 18·87	l 19·04	h 19·76	l 20·56	h 17·90	l 22·54	h 19·02	l 21·31	$M = 20''\cdot15$
	h 19·61	l 20·02	h 19·46	l 19·01	h 20·68	l 21·94	h 18·40	l 20·97	h 20·38	l 23·12	$w = 6\cdot74$
	l 19·38	l 18·01	l 20·96	l 20·72	l 20·92	l 19·82	l 19·12	l 22·11	h 21·16	l 22·46	$\frac{1}{w} = 0\cdot15$
							l 17·60			l 20·55	$C = 65°\ 54'\ 20''\cdot15$
	19·46	19·29	19·76	19·59	20·45	20·77	18·26	21·87	20·19	21·86	

At XXIV (Putagaram)

March 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	133° 19′	313° 20′	212° 30′	32° 30′	291° 40′	111° 40′	10° 51′	190° 51′	90° 6′	270° 6′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	Circle readings, telescope being set on XXVI (Álangudi)										
	″	″	″	″	″	″	″	″	″	″	
XXVI (Álangudi) and XXIII (Kumbakonam)	h 58·50	h 55·57	l 56·93	l 56·33	l 56·10	l 56·70	h 58·54	h 57·66	l 57·50	l 55·83	$M = 57''\cdot29$
	h 59·67	h 56·53	l 59·08	l 56·85	l 56·15	l 56·13	l 58·88	l 59·35	l 58·49	l 56·74	$w = 7\cdot20$
	h 56·44	l 56·09	l 57·91	l 56·67	l 56·84	l 55·75	l 58·42	l 57·99	l 59·52	l 55·66	$\frac{1}{w} = 0\cdot14$
	58·20	56·06	57·97	56·62	56·36	56·19	58·61	58·33	58·50	56·08	$C = 70°\ 3'\ 57''\cdot29$

At XXIV (Putagaram)—(*Continued*).

Angle between	Circle readings, telescope being set on XXVI (Álangudi) 133° 19′	313° 20′	212° 30′	32° 30′	291° 40′	111° 40′	10° 51′	190° 51′	90° 6′	270° 6′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXIII (Kumbakonam) and XXI (Tirupanandál Mandap)	″ *h* 36·75 *h* 36·03 *h* 38·34	″ *h* 38·88 *h* 38·36 *l* 35·36	″ *l* 37·57 *l* 36·84 *l* 36·36	″ *l* 38·28 *l* 36·70 *l* 37·56	″ *l* 38·09 *l* 37·91 *l* 36·56	″ *l* 38·49 *l* 38·20 *l* 39·21	″ *h* 36·35 *l* 34·90 *l* 33·88 *l* 33·73 *l* 34·25 *l* 34·97 *h* 40·55 *h* 38·53	″ *h* 37·41 *l* 37·90 *l* 37·25	″ *l* 36·63 *l* 37·27 *l* 36·93	″ *l* 38·17 *l* 38·49 *l* 37·58	*M* = 37″·36 *w* = 9·52 $\frac{1}{w}$ = 0·11 *C* = 63° 10′ 37″·30
	37·04	37·53	36·92	37·51	37·52	38·63	35·90	37·52	36·94	38·08	

At XXV (Mutuváncheri)

March 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXII (Nayinipiriyán) 0° 6′	180° 6′	79° 16′	259° 16′	158° 25′	338° 25′	237° 38′	57° 38′	316° 51′	136° 52′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXII (Nayinipiriyán) and XXIII (Kumbakonam)	″ *h* 12·35 *h* 14·57 *h* 13·70 *l* 15·47	″ *l* 14·75 *l* 16·83 *l* 16·16	″ *l* 13·93 *l* 14·93 *l* 13·53	″ *l* 14·84 *l* 14·60 *l* 15·45	″ *l* 14·66 *l* 14·09 *l* 13·16	″ *l* 12·67 *l* 13·48 *l* 13·04	″ *l* 14·28 *l* 14·74 *l* 15·03	″ *l* 16·49 *l* 14·77 *l* 14·65	″ *l* 14·04 *l* 13·76 *l* 12·56	″ *l* 13·89 *l* 14·94 *l* 13·89	*M* = 14″·37 *w* = 11·26 $\frac{1}{w}$ = 0·09 *C* = 80° 30′ 14″·37
	14·02	15·91	14·13	14·96	13·97	13·06	14·68	15·30	13·45	14·24	
XXIII (Kumbakonam) and XXVII (Víramangalam)	*h* 43·08 *h* 43·27 *l* 42·43	*l* 43·43 *l* 45·51 *l* 44·05	*l* 44·16 *l* 42·97 *l* 44·51	*l* 47·97 *l* 45·81 *l* 46·06	*l* 45·56 *l* 43·74 *l* 44·96	*l* 44·97 *l* 44·16 *l* 44·31	*l* 44·49 *l* 45·43 *l* 44·26	*l* 44·04 *l* 44·41 *l* 44·65	*l* 44·16 *l* 45·99 *l* 44·88	*l* 44·34 *l* 44·05 *l* 43·94	*M* = 44″·52 *w* = 10·00 $\frac{1}{w}$ = 0·10 *C* = 45° 40′ 44″·52
	42·93	44·33	43·88	46·61	44·75	44·48	44·73	44·37	45·01	44·11	

At XXVI (Álangudi)

March 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXIX (Parutikota) 0° 4′	180° 3′	79° 14′	259° 14′	158° 26′	338° 26′	237° 38′	57° 38′	316° 51′	136° 52′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXIX (Parutikota) and XXVIII (Arasapat)	″ *l* 32·60 *l* 34·45 *l* 34·44	″ *l* 34·52 *l* 35·63 *l* 34·91	″ *h* 32·98 *h* 34·16 *h* 33·28	″ *l* 31·36 *l* 34·11 *l* 29·92 *l* 33·19	″ *l* 30·98 *l* 33·46 *l* 30·63 *l* 32·88	″ *h* 33·63 *h* 34·19 *h* 32·92	″ *l* 32·90 *l* 33·83 *l* 34·53	″ *l* 32·97 *l* 32·82 *l* 32·37	″ *h* 33·67 *h* 34·50 *h* 33·91	″ *l* 33·18 *l* 33·12 *l* 33·56	*M* = 33″·38 *w* = 9·42 $\frac{1}{w}$ = 0·11 *C* = 43° 53′ 33″·36
	33·83	35·02	33·47	32·15	31·99	33·58	33·75	32·72	34·03	33·29	

At XXVI (Álangudi)—(*Continued*).

Angle between	Circle readings, telescope being set on XXIX (Parutikota) 0° 4′	180° 3′	79° 14′	259° 14′	158° 26′	338° 26′	237° 38′	57° 38′	316° 51′	136° 52′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXVIII (Arasapat) and XXVII (Víramangalam)	″ l 56·18 l 58·04 l 57·84	″ l 59·07 l 61·14 l 58·78	″ h 58·25 h 59·24 h 59·06	″ l 59·64 l 58·99 l 60·74 l 60·32	″ l 59·18 l 60·52 l 58·78	″ h 56·76 h 55·71 h 55·73	″ l 58·80 l 59·22 l 58·26	″ l 58·53 l 57·65 l 59·04	″ h 57·75 h 56·99 l 56·91	″ l 60·18 l 59·41 l 60·16	$M = 58''\cdot57$ $w = 5\cdot41$ $\frac{1}{w} = 0\cdot18$ $C = 70^\circ\ 54'\ 58''\cdot57$
	57·35	59·66	58·85	59·92	59·49	56·07	58·76	58·41	57·22	59·92	
XXVII (Víramangalam) and XXIII (Kumbakonam)	l 14·13 l 14·72 l 14·46 l 14·41	l 15·99 l 14·18 l 16·59	h 15·52 h 16·00 h 17·88	l 13·56 l 15·87 l 16·61 l 15·42	l 16·06 l 15·84 l 13·88	h 15·12 h 15·52 h 14·90	l 13·48 l 14·88 l 16·20 l 15·18	l 13·67 l 14·99 l 12·01 l 13·51	h 15·72 h 15·46 h 14·63	l 14·22 l 15·02 l 15·91	$M = 15''\cdot11$ $w = 12\cdot60$ $\frac{1}{w} = 0\cdot08$ $C = 58^\circ\ 23'\ 15''\cdot09$
	14·43	15·59	16·47	15·37	15·26	15·18	14·94	13·55	15·27	15·05	
XXIII (Kumbakonam) and XXIV (Putagaram)	l 43·93 l 43·34 l 43·56	l 43·32 l 41·74 l 42·55	h 43·79 h 38·80 h 41·04 l 41·25	l 41·57 l 43·72 l 41·70	l 42·09 l 42·79 l 42·34	h 41·99 h 43·49 h 42·36	l 41·86 l 41·58 l 40·18 l 40·99	l 41·32 l 42·10 l 40·73 l 38·08	h 42·62 h 42·84 h 42·97	h 40·42 l 41·21 l 42·46	$M = 42''\cdot06$ $w = 8\cdot45$ $\frac{1}{w} = 0\cdot12$ $C = 44^\circ\ 1'\ 42''\cdot04$
	43·61	42·54	41·22	42·33	42·41	42·61	41·15	40·56	42·81	41·36	

At XXVII (Víramangalam)

March 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXV (Mutuváncheri) 236° 15′	56° 15′	315° 25′	135° 24′	34° 34′	214° 35′	113° 48′	293° 48′	193° 1′	13° 1′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXV (Mutuváncheri) and XXIII (Kumbakonam)	″ l 40·48 l 39·88 l 40·25	″ l 39·76 l 40·52 l 40·72	″ h 39·76 h 39·32 h 39·04	″ l 40·27 l 39·67 l 40·35	″ l 39·28 l 38·08 l 40·86 h 38·95	″ l 39·21 l 40·00 l 40·16	″ h 41·27 h 40·29 h 40·14	″ l 37·96 l 39·46 l 39·57	″ l 40·51 l 39·91 l 41·95	″ l 38·90 l 38·48 l 38·16 l 40·42	$M = 39''\cdot84$ $w = 18\cdot10$ $\frac{1}{w} = 0\cdot06$ $C = 51^\circ\ 6'\ 39''\cdot83$
	40·20	40·33	39·37	40·10	39·29	39·79	40·57	39·00	40·79	38·99	
XXIII (Kumbakonam) and XXVI (Álangudi)	l 43·47 l 42·52 l 42·47	l 41·81 l 41·61 l 41·15	h 40·67 h 41·36 h 41·98	l 41·34 l 41·66 l 41·40	l 39·38 l 40·08 l 40·08 h 40·16	l 42·32 l 43·24 l 42·83	h 41·41 h 41·61 h 40·29	l 41·22 l 42·03 l 40·97	l 43·10 l 43·75 l 41·45	l 41·84 l 41·89 l 42·30	$M = 41''\cdot72$ $w = 11\cdot02$ $\frac{1}{w} = 0\cdot09$ $C = 76^\circ\ 1'\ 41''\cdot72$
	42·82	41·52	41·34	41·47	39·93	42·80	41·10	41·41	42·77	42·01	

At XXVII (Víramangalam)—(*Continued*).

Angle between	Circle readings, telescope being set on XXV (Mutuváncheri) 236° 15′	56° 15′	315° 25′	135° 24′	34° 34′	214° 35′	113° 48′	293° 48′	193° 1′	13° 1′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXVI (Álangudi) and XXVIII (Arasapat)	l 20·73 l 21·44 l 22·12	l 21·66 l 20·87 l 21·34	h 22·74 h 22·59 h 22·69	l 22·46 l 22·16 l 21·74	l 22·75 l 21·97 l 20·86 h 21·99	l 22·01 l 20·80 l 21·27	h 19·86 h 20·75 h 21·80	l 22·90 l 20·69 l 22·57	l 20·67 l 20·41 l 22·00	l 20·99 l 21·09 l 20·95	M = 21″·57 w = 21·80 $\frac{1}{w}$ = 0·05 C = 67° 57′ 21″·57
	21·43	21·29	22·67	22·12	21·89	21·36	20·80	22·05	21·03	21·01	
XXVIII (Arasapat) and XXX (Rárámutiraikota)	l 14·13 l 12·92 l 14·03	l 11·35 l 11·50 l 10·08	h 14·25 h 13·76 h 12·48	l 10·45 l 11·81 l 11·99	l 13·15 l 14·01 l 14·55 h 10·78	l 12·00 l 13·20 l 12·07	h 13·06 h 12·45 h 11·16	l 10·82 l 11·49 l 12·35	l 12·34 l 12·24 l 12·38	l 13·45 l 13·13 l 13·56	M = 12″·46 w = 9·14 $\frac{1}{w}$ = 0·11 C = 41° 3′ 12″·46
	13·69	10·98	13·50	11·42	13·12	12·42	12·22	11·55	12·32	13·38	

At XXVIII (Arasapat)

February 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXX (Rárámutiraikota) 0° 6′	180° 5′	79° 14′	259° 12′	158° 25′	338° 25′	237° 38′	57° 37′	316° 51′	136° 50′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXX (Rárámutiraikota) and XXVII (Víramangalam)	l 3·41 l 4·41 l 3·39	l 4·67 l 5·83 l 3·31	h 3·74 h 4·10 l 4·24	l 3·86 l 3·71 l 2·75	l 2·75 l 5·48 h 0·63 h 2·69	h 3·98 h 3·78 l 3·39	l 4·90 l 3·65 l 3·88	l 3·22 l 4·83 h 3·31	h 0·05 h 2·72 l 5·90 l 2·07	l 1·80 l 3·66 l 1·85	M = 3″·55 w = 11·50 $\frac{1}{w}$ = 0·09 C = 67° 16′ 3″·53
	3·74	4·60	4·03	3·44	2·89	3·72	4·14	3·79	2·69	2·44	
XXVII (Víramangalam) and XXVI (Álangudi)	l 39·41 l 38·08 l 38·21	l 40·88 l 41·14 l 41·90	h 39·47 h 39·32 l 39·32	l 40·91 l 40·06 l 41·02	l 40·06 l 39·77 h 41·64	h 39·42 h 41·67 l 40·12	l 40·58 l 40·13 l 40·94	l 40·42 l 40·42 h 39·40	h 39·25 h 40·41 l 41·21	l 40·88 l 41·01 l 39·49	M = 40″·22 w = 14·30 $\frac{1}{w}$ = 0·07 C = 41° 7′ 40″·22
	38·57	41·31	39·37	40·66	40·49	40·40	40·55	40·08	40·29	40·46	
XXVI (Álangudi) and XXIX (Parutikota)	l 48·10 l 47·75 l 49·40	l 48·91 l 48·70 l 47·75	h 46·78 h 47·51 l 47·50	l 49·55 l 47·34 l 48·68	l 46·80 l 48·55 l 46·14	h 46·88 h 45·91 l 47·02 l 46·06	l 47·86 l 49·01 l 48·79	l 47·53 l 46·92 h 45·91	h 48·46 h 46·17 l 46·43	l 45·95 l 46·38 l 47·79 l 47·54	M = 47″·56 w = 11·72 $\frac{1}{w}$ = 0·09 C = 64° 37′ 47″·55
	48·42	48·45	47·26	48·52	47·16	46·47	48·55	46·79	47·02	46·92	

At XXVIII (Arasapat)—(*Continued*).

Angle between	Circle readings, telescope being set on XXX (Rárámutiraikota) 0° 6′	180° 5′	79° 14′	259° 12′	158° 25′	338° 25′	237° 38′	57° 37′	316° 51′	136° 50′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXIX (Parutikota) and XXXI (Púvatúr)	″ l 25·68 l 24·25 l 24·27	″ l 22·83 l 23·03 l 23·16	″ h 23·45 h 23·99 h 24·87 l 22·38	″ l 25·38 l 23·94 l 24·74	″ l 21·72 l 24·60 h 25·49 l 23·09	″ h 24·90 h 27·90 l 25·18 l 25·38	″ l 24·55 l 24·86 l 24·66	″ l 24·23 l 24·86 h 24·08	″ h 25·54 h 26·06 l 28·24 l 26·45	″ l 22·78 l 25·93 l 23·72 l 23·80	$M = 24''·54$ $w = 7·40$ $\frac{1}{w} = 0·14$ $C = 73° 54' 24''·55$
	24·73	23·01	23·67	24·69	23·73	25·84	24·69	24·39	26·57	24·06	
XXXI (Púvatúr) and XXXII (Kakkrákota)	l 37·36 l 35·92 l 35·80	l 35·65 l 34·63 l 31·96 h 34·70	h 35·06 h 36·57 l 36·30	l 34·41 l 33·45 l 33·48	l 37·09 l 33·14 h 34·11 h 32·78 l 35·93	h 35·57 h 34·96 l 34·30	l 38·17 l 33·73 l 33·67 h 33·31	l 34·75 l 36·11 h 34·79	h 36·01 h 34·96 l 33·13	l 33·62 l 35·12 l 33·24	$M = 34''·85$ $w = 8·97$ $\frac{1}{w} = 0·11$ $C = 36° 58' 34''·84$
	36·36	34·24	35·98	33·78	34·61	34·94	34·72	35·22	34·70	33·99	
XXXII (Kakkrákota) and XXX (Rárámutiraikota)	l 27·24 l 28·28 l 30·46	l 25·69 l 25·94 l 26·74 h 24·77	h 29·84 h 29·27 l 29·68	l 27·35 l 26·87 l 25·75	l 28·80 l 29·65 h 30·72 l 31·19	h 26·74 h 28·45 l 27·74	l 25·40 l 26·35 l 27·33	l 28·53 l 26·71 h 30·43	h 27·76 h 29·45 l 28·70	l 30·41 l 30·36 l 31·59	$M = 28''·28$ $w = 3·32$ $\frac{1}{w} = 0·30$ $C = 76° 5' 28''·28$
	28·66	25·79	29·60	26·66	30·09	27·64	26·36	28·56	28·64	30·79	

At XXIX (Parutikota)

February 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXI (Púvatúr) 137° 43′	317° 42′	216° 52′	36° 51′	296° 0′	116° 0′	15° 15′	195° 15′	94° 29′	274° 28′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXI (Púvatúr) and XXVIII (Arasapat)	″ l 13·61 l 12·98 l 13·04	″ l 11·65 l 12·63 l 12·91	″ l 11·80 l 13·25 l 10·83	″ l 13·48 l 12·70 l 12·78	″ l 14·06 l 11·72 l 12·51	″ h 13·24 h 12·99 h 12·38	″ l 11·44 l 13·03 l 11·16	″ l 12·58 l 13·24 l 11·81	″ l 13·50 l 13·29 h 12·97	″ l 12·89 l 14·81 l 10·88 l 11·85	$M = 12''·65$ $w = 23·60$ $\frac{1}{w} = 0·04$ $C = 66° 8' 12''·65$
	13·21	12·40	11·96	12·99	12·76	12·87	11·88	12·54	13·25	12·61	
XXVIII (Arasapat) and XXVI (Álangudi)	l 40·56 l 40·06 l 41·28	l 38·05 l 41·11 l 38·25	l 40·35 l 39·21 l 40·46	l 40·28 l 39·54 l 39·06	l 38·64 l 41·12 l 39·09	h 40·97 h 40·94 h 42·28	l 39·43 l 38·80 l 39·34	l 41·51 l 39·85 l 40·40	l 39·48 l 38·76 l 38·65	l 37·85 l 40·20 l 43·31 l 41·70	$M = 39''·99$ $w = 9·90$ $\frac{1}{w} = 0·10$ $C = 71° 28' 40''·00$
	40·63	39·14	40·01	39·63	39·62	41·40	39·19	40·59	38·96	40·77	

At XXX (Rárámutiraikota)

February 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXVII (Víramangalam) 0° 4′	180° 1′	79° 14′	259° 11′	158° 25′	338° 22′	237° 36′	57° 33′	316° 50′	186° 47′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXVII (Víramangalam) and XXVIII (Arasapat)	l 39·66	l 39·94	l 42·58	l 42·73	l 44·53	l 42·59	l 42·80	l 43·87	l 41·27	l 44·18	$M = 42''·56$
	l 41·62	l 44·82	l 43·18	l 41·81	l 43·92	h 43·62	l 43·32	l 39·41	l 42·51	l 44·49	$w = 7·22$
	l 43·40	l 44·33	l 42·30	l 41·15	l 43·12	l 42·22	l 43·69	l 42·83	l 43·91	l 43·37	$\frac{1}{w} = 0·14$
	l 39·46	l 40·74				l 39·90		h 40·88			$C = 71° 40' 42''·53$
	41·04	42·46	42·69	41·90	43·86	42·08	43·27	41·75	42·56	44·01	
XXVIII (Arasapat) and XXXII (Kakkrákota)	l 50·77	l 52·81	l 49·03	l 47·26	l 49·36	l 51·48	l 50·77	l 50·05	l 52·26	l 51·48	$M = 50''·27$
	l 49·21	l 50·54	l 48·85	l 50·13	l 49·86	h 48·36	l 51·79	l 49·89	l 50·12	l 51·76	$w = 10·60$
	l 50·90	l 50·08	l 49·75	l 49·89	l 49·16	l 51·49	l 49·63	l 49·84	l 50·67	l 50·86	$\frac{1}{w} = 0·09$
	50·29	51·14	49·21	49·09	49·46	50·44	50·73	49·93	51·02	51·37	$C = 66° 14' 50''·27$

At XXXI (Púvatúr)

† *February and March* 1877; *observed by Captain T. T. Carter, R. E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

* *February* 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIV (Patukota) 0° 1′	180° 0′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	186° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
† XXXIV (Patukota) and XXXIII (Pátharankota)	l 18·31	l 16·73	l 16·39	l 18·37	l 16·53	l 18·20	l 17·20	l 17·48	l 18·81	l 15·99	$M = 17''·60$
	l 17·95	l 17·88	l 15·15	l 17·44	l 18·33	l 17·47	l 18·85	l 18·15	l 20·29	l 16·69	$w = 13·98$
	l 16·69	l 18·46	l 17·12	l 18·72	l 17·28	l 17·86	l 17·91	h 17·33	l 17·67	l 17·06	$\frac{1}{w} = 0·07$
									l 18·66		$C = 39° 11' 17''·61$
	17·65	17·69	16·22	18·18	17·38	17·84	17·99	17·65	18·86	16·58	
† XXXIII (Pátharankota) and XXXII (Kakkrákota)	l 38·85	l 38·93	l 39·89	l 38·67	l 41·26	l 38·46	l 40·98	l 37·37	l 38·25	l 40·15	$M = 39''·05$
	l 39·29	l 40·54	l 39·24	l 39·77	l 38·05	l 39·68	l 37·93	l 37·54	l 37·32	l 39·91	$w = 13·38$
	l 39·60	l 39·55	l 39·95	l 37·75	l 39·15	l 39·09	l 38·94	l 37·87	l 38·73	l 40·21	$\frac{1}{w} = 0·07$
					l 38·74		l 38·21				$C = 67° 50' 39''·05$
	39·25	39·67	39·69	38·73	39·30	39·08	39·02	37·59	38·10	40·09	

At XXXI (Púvatúr)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXIV (Patukota)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 0′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
* XXXII (Kakkrákota) and XXVIII (Arasapat)	h 23·71 h 20·92 h 19·59 l 21·77	l 22·92 l 25·08 l 22·61	l 18·77 l 20·58 l 20·27 l 20·52	l 25·29 l 23·67 l 23·51	l 21·50 l 21·83 l 21·11	h 24·52 h 23·66 h 24·82 l 23·58	l 22·76 l 24·12 l 24·49	l 23·97 l 23·35 l 23·72	l 22·77 l 23·40 l 24·67	l 24·15 l 24·67 l 23·81	$M = 23''·02$ $w = 4·23$ $\frac{1}{w} = 0·24$ $C = 72° 46' 23''·01$
	21·50	23·54	20·04	24·16	21·48	24·14	23·79	23·68	23·61	24·21	
* XXVIII (Arasapat) and XXIX (Parutikota)	h 24·34 h 23·78 h 21·13 l 23·32	l 21·99 l 24·77 l 21·74	l 23·90 l 23·72 l 23·37	l 23·64 l 24·07 l 24·25	l 24·10 l 25·04 l 24·29	h 22·75 h 24·18 h 25·53 l 22·45	l 24·63 l 22·55 l 23·12	l 22·76 l 22·49 l 22·42	l 24·19 l 23·53 l 23·21	l 23·44 l 23·98 l 22·64	$M = 23''·48$ $w = 18·64$ $\frac{1}{w} = 0·05$ $C = 39° 57' 23''·48$
	23·14	22·83	23·66	23·99	24·48	23·73	23·43	22·56	23·64	23·35	

At XXXII (Kakkrákota)

† *February* 1877; *observed by Captain T. T. Carter, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

* *February* 1878; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXX (Rárámutiraikota)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	223° 26′	43° 23′	302° 37′	122° 34′	21° 49′	201° 49′	101° 2′	281° 2′	180° 14′	0° 15′	
	″	″	″	″	″	″	″	″	″	″	
* XXX (Rárámutiraikota) and XXVIII (Arasapat)	l 43·09 l 41·07 l 41·97	l 43·07 l 44·29 l 42·71	l 42·26 l 42·89 l 40·69	l 45·79 l 45·08 l 45·57	l 41·29 l 46·69 l 43·87 l 43·70	h 44·47 h 40·95 h 45·72 l 41·68	l 41·85 l 44·18 l 43·44	l 40·90 l 39·22 l 42·06 l 41·09	l 45·83 l 42·40 l 42·60 l 43·56	l 44·38 l 43·36 l 41·91	$M = 43''·07$ $w = 4·82$ $\frac{1}{w} = 0·21$ $C = 37° 39' 43''·06$
	42·04	43·36	41·95	45·48	43·89	43·21	43·16	40·82	43·60	43·22	
* XXVIII (Arasapat) and XXXI (Púvatúr)	l 61·81 l 65·34 l 64·23 l 64·27	l 62·74 l 63·27 l 62·35	l 63·75 l 59·99 l 64·11 l 61·96	l 63·80 l 62·04 l 63·12	l 62·92 l 60·46 l 62·23	h 61·77 h 58·16 h 64·10 l 62·27	l 63·73 l 61·05 l 63·12	l 64·32 l 64·43 l 62·00	l 64·52 l 64·05 l 63·88	l 60·73 l 61·41 l 61·48	$M = 62''·72$ $w = 6·98$ $\frac{1}{w} = 0·14$ $C = 70° 15' 2''·72$
	63·91	62·79	62·45	62·99	61·87	61·58	62·63	63·58	64·15	61·21	

At XXXII (Kakkrákota)—(*Continued*).

Angle between	Circle readings, telescope being set on XXX (Rárámutiraikota) 223° 26′	43° 23′	302° 37′	122° 34′	21° 49′	201° 49′	101° 2′	281° 2′	180° 14′	0° 15′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XXXI (Púvatúr) and XXXIII (Pátharankota)	″ l 31·41 l 30·98 l 32·13 l 31·67	″ l 31·47 l 31·50 l 32·52	″ l 30·42 l 30·22 l 30·52	″ l 30·76 l 30·13 l 30·60	″ l 30·48 l 31·46 l 31·67	″ l 32·09 l 29·76 l 31·78	″ l 30·67 l 31·35 l 31·71	″ l 31·21 l 30·80 l 30·13	″ l 30·50 l 29·56 l 30·49	″ l 29·63 l 30·48 l 29·96	$M = 30''·88$ $w = 21·80$ $\frac{1}{w} = 0·05$ $C = 71° 36' 30''·88$
	31·55	31·83	30·39	30·50	31·20	31·21	31·24	30·71	30·18	30·02	
† XXXIII (Pátharankota) and XXXV (Kallakota)	l 30·45 l 31·12 l 28·45 l 29·79	l 29·33 l 28·00 l 29·04	l 29·93 l 30·02 l 29·69	l 30·46 l 29·90 l 29·51	l 29·81 l 30·71 l 29·85	l 30·19 l 29·17 l 29·53	l 28·73 l 30·33 l 30·25	l 31·17 l 30·67 l 31·98	l 28·07 l 29·93 l 30·28	l 30·94 l 30·69 l 31·22	$M = 29''·98$ $w = 15·98$ $\frac{1}{w} = 0·06$ $C = 43° 52' 29''·98$
	29·95	28·79	29·88	29·96	30·12	29·63	29·77	31·27	29·43	30·95	

At XXXIII (Pátharankota)

March 1877; *observed by Captain T. T. Carter, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXVII (Kárakkurchi) 0° 1′	180° 0′	79° 12′	259° 12′	158° 24′	338° 24′	237° 37′	57° 36′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXVII (Kárakkurchi) and XXXV (Kallakota)	″ l 17·97 l 18·03 l 16·04	″ l 16·55 l 19·63 l 17·07 l 18·66	″ l 15·87 l 17·44 l 16·41	″ l 16·81 l 16·68 l 16·20	″ l 15·82 l 15·56 l 17·03	″ l 18·04 l 17·10 l 18·94	″ l 16·79 l 17·62 l 17·13	″ l 16·39 l 17·47 l 18·18	″ l 17·43 l 17·59 l 17·79	″ l 17·60 l 18·62 l 19·42	$M = 17''·33$ $w = 13·40$ $\frac{1}{w} = 0·07$ $C = 66° 52' 17''·34$
	17·35	17·98	16·57	16·56	16·14	18·03	17·18	17·35	17·60	18·55	
XXXV (Kallakota) and XXXII (Kakkrákota)	l 19·16 l 19·26 l 19·56	l 20·08 l 18·92 l 20·52	l 19·43 l 19·13 l 19·11	l 20·43 l 21·21 l 20·74	l 19·93 l 19·82 l 19·51	l 19·87 l 20·13 l 19·98	l 19·37 l 20·05 l 19·55	l 21·37 l 18·76 l 19·08 l 19·46	l 19·25 l 20·01 l 19·01	l 20·32 l 19·32 l 18·77	$M = 19''·71$ $w = 34·75$ $\frac{1}{w} = 0·03$ $C = 62° 8' 19''·71$
	19·33	19·84	19·22	20·79	19·75	19·99	19·66	19·67	19·42	19·47	
XXXII (Kakkrákota) and R. M.	l 2·14 l 3·61 l 3·30	l 2·67 l 2·57 l 0·79	l 2·79 l 3·41 l 2·51	l 2·49 l 3·05 l 2·23	l 1·32 l 2·99 l 2·60	l 1·64 l 3·10 l 3·02	l 2·26 l 3·68 l 2·14	l 2·70 l 1·69 l 3·38	l 4·13 l 3·51 l 2·50	l 2·79 l 2·54 l 3·40	$M = 2''·70$ $w = 35·70$ $\frac{1}{w} = 0·03$ $C = 0° 8' 2''·70$
	3·02	2·01	2·90	2·59	2·30	2·59	2·69	2·59	3·38	2·91	

NOTE.—R. M. denotes Referring Mark.

At XXXIII (Pátharankota)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXVII (Kárakkurchi) 0° 1′	180° 0′	79° 12′	259° 12′	158° 24′	338° 24′	237° 37′	57° 36′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
R. M. and XXXI (Púvatúr)	″ l 47·11 l 47·81 l 45·46	″ l 47·04 l 48·02 l 48·71	″ l 45·43 l 47·74 l 45·20 l 45·62	″ l 46·69 l 46·10 l 46·94	″ l 47·99 l 48·10 l 47·31	″ l 46·74 l 46·35 l 46·54	″ l 47·56 l 46·41 l 47·60	″ l 47·50 l 46·99 l 46·54	″ l 46·49 l 47·43 l 48·28	″ l 47·14 l 47·79 l 46·21	$M = 47''\cdot03$ $w = 20\cdot17$ $\frac{1}{w} = 0\cdot05$ $C = 40^\circ\ 24'\ 47''\cdot02$
	46·79	47·92	46·00	46·58	47·80	46·54	47·19	47·01	47·40	47·05	
XXXI (Púvatúr) and XXXIV (Patukota)	l 42·15 l 40·21 l 41·57	l 41·90 l 41·00 l 40·64	l 43·06 l 42·35 l 42·70	l 39·92 l 41·28 l 41·13	l 40·53 l 41·68 l 40·91	l 41·58 l 40·80 l 40·93	l 41·13 l 41·31 l 41·78	l 40·89 l 40·70 l 40·45	l 41·61 l 42·67 l 41·70	l 41·52 l 40·56 l 41·62	$M = 41''\cdot34$ $w = 22\cdot70$ $\frac{1}{w} = 0\cdot04$ $C = 68^\circ\ 7'\ 41''\cdot34$
	41·31	41·18	42·70	40·78	41·04	41·10	41·41	40·68	41·99	41·23	
XXXIV (Patukota) and XXXVI (Kalúrunikád)	l 49·63 l 45·49 l 46·84 l 47·57 l 47·56	l 46·93 l 48·81 l 48·24	l 48·72 l 49·08 l 48·60	l 49·36 l 48·09 l 49·42	l 46·84 l 47·40 l 47·25	l 48·93 l 48·38 l 48·66	l 47·36 l 48·61 l 47·45	l 47·62 l 48·43 l 48·43	l 47·36 l 47·11 l 47·16	l 47·58 l 47·85 l 48·56	$M = 48''\cdot02$ $w = 18\cdot11$ $\frac{1}{w} = 0\cdot06$ $C = 69^\circ\ 36'\ 48''\cdot01$
	47·42	47·99	48·80	48·96	47·16	48·66	47·81	48·16	47·21	48·00	
XXXVI (Kalúrunikád) and XXXVII (Kárakkurchi)	l 0·94 l 3·21 l 1·94 l 3·93	l 1·41 l 1·80 l 1·98	l 1·57 l 1·97 l 2·80	l 2·44 l 3·54 l 1·74	l 3·06 l 3·53 l 4·09	l 2·33 l 4·92 l 3·49 l 2·58	l 2·51 l 2·65 l 2·03	l 4·18 l 3·89 l 4·16	l 2·58 l 1·89 l 1·29	l 2·91 l 2·47 l 2·02	$M = 2''\cdot67$ $w = 14\cdot06$ $\frac{1}{w} = 0\cdot07$ $C = 52^\circ\ 42'\ 2''\cdot67$
	2·51	1·73	2·11	2·57	3·56	3·33	2·40	4·08	1·92	2·47	

At XXXIV (Patukota)

March 1877; *observed by Captain T. T. Carter, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXVI (Kalúrunikád) 140° 37′	320° 36′	219° 49′	89° 48′	299° 0′	119° 0′	18° 13′	198° 13′	97° 25′	277° 25′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXVI (Kalúrunikád) and XXXIII (Pátharankota)	″ l 51·07 l 51·65 l 51·05	″ l 50·18 l 50·52 l 51·59	″ l 51·49 l 51·05 l 50·07	″ l 50·87 l 49·50 l 51·70	″ l 51·57 l 50·89 l 51·14	″ l 50·95 l 50·72 l 50·31	″ l 51·58 l 51·20 l 52·48	″ l 51·47 l 52·01 l 51·87	″ l 51·39 l 49·69 l 50·98	″ l 51·11 l 50·57 l 51·06	$M = 51''\cdot06$ $w = 37\cdot00$ $\frac{1}{w} = 0\cdot03$ $C = 67^\circ\ 54'\ 51''\cdot06$
	51·26	50·76	50·87	50·69	51·20	50·66	51·75	51·78	50·69	50·91	

NOTE.—R. M. denotes Referring Mark.

At XXXIV (Patukota)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXVI (Kalúrunikád) 140° 37′	320° 36′	219° 49′	39° 48′	299° 0′	119° 0′	18° 18′	198° 18′	97° 25′	277° 25′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXXIII (Pátharankota) and XXXI (Púvatúr)	″	″	″	″	″	″	″	″	″	″	
	l 61·08	l 61·78	l 61·07	l 61·27	l 59·78	l 61·82	l 61·29	l 61·37	l 60·44	l 61·45	$M = 61''·25$
	l 61·33	l 60·81	l 61·12	l 61·39	l 62·10	l 60·72	l 61·21	l 61·27	l 62·56	l 60·65	$w = 46·21$
	l 60·48	l 60·55	l 61·96	l 60·79	l 61·60	l 61·86	l 60·05	l 62·33	l 61·85	l 62·33	$\frac{1}{w} = 0·02$
					l 60·09						
	60·96	61·05	61·38	61·15	60·89	61·47	60·85	61·66	61·62	61·48	$C = 72° 41' 1''·24$

At XXXV (Kallakota)

February 1877; *observed by Captain T. T. Carter, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXII (Kakkrákota) 143° 32′	323° 32′	222° 44′	42° 44′	301° 56′	121° 56′	21° 8′	201° 8′	100° 21′	280° 20′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXXII (Kakkrákota) and XXXIII (Pátharankota)	″	″	″	″	″	″	″	″	″	″	
	h 8·78	l 10·70	l 8·42	l 11·10	l 9·78	l 10·39	l 8·60	l 11·86	l 10·06	l 13·00	$M = 10''·29$
	l 8·74	l 9·71	l 10·72	l 10·20	l 8·50	l 10·68	l 8·95	l 9·79	l 11·52	l 11·83	$w = 8·42$
	l 10·16	l 10·99	l 9·86	l 10·40	l 10·17	l 9·94	l 9·00	l 10·78	l 11·42	l 12·18	$\frac{1}{w} = 0·12$
									l 11·61		
	9·23	10·47	9·67	10·57	9·48	10·34	8·85	10·81	11·15	12·34	$C = 73° 59' 10''·29$
XXXIII (Pátharankota) and XXXVII (Kárakkurchi)	h 41·76	l 42·13	l 41·77	l 44·03	l 42·62	l 42·65	l 41·99	l 41·93	l 42·68	l 42·95	$M = 42''·30$
	l 40·20	l 41·55	l 43·97	l 42·60	l 42·30	l 42·69	l 43·58	l 42·16	l 42·32	l 42·17	$w = 14·18$
	l 40·26	l 41·69	l 42·90	l 43·73	l 41·67	l 42·38	l 43·16	l 42·25	l 39·96	l 42·44	$\frac{1}{w} = 0·07$
									l 42·44		
	40·74	41·79	42·88	43·45	42·20	42·57	42·91	42·11	41·85	42·52	$C = 69° 32' 42''·30$

At XXXVI (Kalúrunikád)

February 1877; *observed by Captain T. T. Carter, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIX (Rĕtavayal) 214° 9′	34° 8′	293° 21′	113° 21′	12° 32′	192° 32′	91° 45′	271° 45′	170° 57′	350° 56′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXXIX (Rĕtavayal) and XXXVIII (Merpanaikád)	″	″	″	″	″	″	″	″	″	″	
	l 29·34	l 32·08	l 31·21	l 30·87	l 32·12	l 31·04	l 32·96	h 33·62	l 29·81	l 30·95	$M = 31''·47$
	l 30·78	l 32·90	l 29·72	l 31·17	l 30·87	l 32·17	l 34·57	l 32·18	l 32·84	l 30·08	$w = 11·34$
	l 30·19	l 32·18	l 32·24	l 32·54	l 31·58	l 30·80	l 31·88	l 30·93	l 31·92	l 30·96	$\frac{1}{w} = 0·09$
							h 31·21	l 32·42	d 30·06		
	30·10	32·39	31·06	31·53	31·52	31·34	32·66	32·29	31·16	30·66	$C = 43° 50' 31''·48$

At XXXVI (Kalúrunikád)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXIX (Rĕtavayal) 214° 9′	34° 8′	293° 21′	113° 21′	12° 32′	192° 32′	91° 45′	271° 45′	170° 57′	350° 56′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXVIII (Merpanaikád) and XXXVII (Kárakkurchi)	l 59·95	l 58·52	l 59·52	l 58·86	l 59·68	l 60·77	l 59·11	h 56·97	l 59·80	l 59·55	$M = 59''\cdot32$
	l 59·65	l 59·80	l 60·54	l 60·96	l 60·44	l 59·56	l 59·63	l 56·19	l 61·33	l 59·61	$w = 12\cdot78$
	l 59·47	l 59·48	l 58·65	l 58·22	l 58·96	l 59·42	l 58·42	l 58·26	l 60·09	l 60·07	$\frac{1}{w} = 0\cdot08$
				l 58·45			h 58·49	l 57·74	d 58·95		$C = 61^\circ 10' 59''\cdot31$
	59·69	59·27	59·57	59·12	59·69	59·92	58·91	57·29	60·04	59·74	
XXXVII (Kárakkurchi) and XXXIII (Pátharankota)	l 11·35	l 12·56	l 12·04	l 12·49	l 12·96	l 10·86	l 11·73	h 13·70	l 11·84	l 10·78	$M = 11''\cdot54$
	l 11·78	l 10·68	l 11·05	l 12·35	l 12·48	l 10·00	l 10·80	l 11·71	l 11·40	l 10·82	$w = 13\cdot54$
	l 11·93	l 11·59	l 11·81	l 12·17	l 12·58	l 12·15	h 11·28	l 12·88	l 8·87	l 9·59	$\frac{1}{w} = 0\cdot07$
					d 10·86	l 10·64			l 10·32		$C = 66^\circ 38' 11''\cdot53$
	11·69	11·61	11·63	12·34	12·22	10·91	11·27	12·76	10·61	10·40	
XXXIII (Pátharankota) and XXXIV (Patukota)	l 21·15	l 20·08	l 21·82	l 21·23	l 20·91	l 21·43	l 19·94	h 21·43	l 20·09	l 21·41	$M = 21''\cdot22$
	l 21·67	l 22·18	l 22·19	l 20·99	l 21·22	l 21·81	l 20·38	l 22·06	l 21·26	l 20·39	$w = 19\cdot84$
	l 22·05	l 20·69	l 22·72	l 20·74	l 21·36	l 21·07	h 19·89	l 22·58	l 21·06	l 21·94	$\frac{1}{w} = 0\cdot05$
					d 19·35				l 21·13		$C = 42^\circ 28' 21''\cdot21$
	21·62	20·98	22·24	20·99	20·71	21·44	20·07	22·02	20·89	21·25	

At XXXVII (Kárakkurchi)

***February* 1877; *observed by Captain T. T. Carter, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XXXV (Kallakota) 207° 26′	27° 26′	286° 38′	106° 38′	5° 50′	185° 50′	85° 2′	265° 2′	164° 14′	344° 15′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXV (Kallakota) and XXXIII (Pátharankota)	l 59·90	l 60·29	l 58·76	l 60·83	l 60·39	l 59·56	l 59·39	l 60·85	l 59·25	l 60·34	$M = 60''\cdot00$
	l 59·28	l 59·52	l 59·37	l 59·99	l 60·72	l 60·27	l 58·67	l 60·84	l 59·89	l 60·72	$w = 18\cdot50$
	l 58·40	l 60·63	l 59·98	l 61·18	l 61·21	l 59·25	l 59·00	l 59·52	l 60·46	l 61·53	$\frac{1}{w} = 0\cdot05$
	59·19	60·15	59·37	60·67	60·77	59·69	59·02	60·40	59·87	60·86	$C = 43^\circ 35' 0''\cdot00$
XXXIII (Pátharankota) and XXXVI (Kalúrunikád)	l 44·51	l 46·06	l 45·46	l 45·87	l 45·51	l 45·52	l 46·13	l 44·32	l 44·96	l 45·76	$M = 45''\cdot17$
	l 46·13	l 45·54	l 45·25	l 45·60	l 43·89	l 45·54	l 46·07	l 44·70	l 45·14	l 45·33	$w = 28\cdot15$
	l 47·08	l 45·09	l 43·27	l 44·37	l 44·07	l 45·47	l 44·48	l 44·86	l 45·93	l 43·90	$\frac{1}{w} = 0\cdot04$
	l 45·12										$C = 60^\circ 39' 45''\cdot18$
	45·71	45·56	44·66	45·28	44·49	45·51	45·56	44·63	45·34	45·00	

At XXXVII (Kárakkurchi)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXV (Kallakota) 207° 26′	27° 26′	286° 38′	106° 38′	5° 50′	185° 50′	85° 2′	265° 2′	164° 14′	344° 15′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXVI (Kalúrunikád) and XXXVIII (Merpanaikád)	″ l 33·12 l 34·17 l 33·04	″ l 34·43 l 34·68 l 35·32	″ l 34·12 l 36·24 l 36·58	″ l 35·14 l 34·88 l 35·27	″ l 33·47 l 33·82 l 34·04	″ l 35·20 l 34·62 l 35·03	″ l 32·13 l 33·86 l 34·25	″ l 34·83 l 34·50 l 35·06	″ l 34·13 l 33·80 l 32·45 l 34·43	″ l 34·54 l 34·44 l 33·91	$M = 34''·39$ $w = 13·76$ $\frac{1}{w} = 0·07$ $C = 67° 57' 34''·39$
	33·44	34·81	35·65	35·10	33·78	34·95	33·41	34·80	33·70	34·30	
XXXVIII (Merpanaikád) and XL (Kulamangalam)	l 54·05 l 54·53 l 54·16	l 55·97 l 54·78 l 54·89	l 55·83 l 56·05 l 55·96	l 56·65 l 55·20 l 55·40	l 55·79 l 56·21 l 56·42	l 55·90 l 55·82 l 56·47	l 55·72 l 55·94 l 53·73 l 55·28	l 55·99 l 55·78 l 55·82	l 53·03 l 54·84 l 52·45 l 54·69	l 55·71 l 55·46 l 55·36	$M = 55''·37$ $w = 13·42$ $\frac{1}{w} = 0·07$ $C = 35° 12' 55''·36$
	54·25	55·21	55·95	55·75	56·14	56·06	55·17	55·86	53·75	55·51	

At XXXVIII (Merpanaikád)

January 1877 ; *observed by Captain T. T. Carter, R.E., and Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIX (Rĕtavayal) 0° 2′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXIX (Rĕtavayal) and XLI (Mánúr)	″ l 45·93 l 44·76 l 44·75	″ l 45·81 l 46·27 l 45·65	″ l 44·16 l 44·17 l 44·08	″ l 44·99 l 45·77 l 44·69	″ l 44·36 l 43·65 l 43·55	″ l 44·30 l 45·34 l 45·03	″ l 44·85 l 44·27 l 45·46	″ l 43·86 l 44·65 l 45·59	″ l 43·90 l 44·49 l 44·50	″ l 46·58 l 44·51 l 44·30	$M = 44''·81$ $w = 21·70$ $\frac{1}{w} = 0·05$ $C = 64° 49' 44''·81$
	45·15	45·91	44·14	45·15	43·85	44·89	44·86	44·70	44·30	45·13	
XLI (Mánúr) and XLII (Pallathivayal)	l 28·18 l 26·53 l 28·48	l 29·52 l 28·92 l 29·67	l 27·63 l 27·46 l 28·80	l 28·35 l 28·52 l 29·32	l 29·17 l 28·65 l 29·16	l 27·31 l 28·80 l 28·89	l 28·52 l 29·01 l 28·39	l 28·27 l 27·33 l 27·96	l 29·27 l 28·38 l 27·10	l 26·96 l 27·28 l 26·53	$M = 28''·28$ $w = 16·70$ $\frac{1}{w} = 0·06$ $C = 45° 14' 28''·28$
	27·73	29·37	27·96	28·73	28·99	28·33	28·64	27·85	28·25	26·92	
XLII (Pallathivayal) and XL (Kulamangalam)	l 45·94 l 46·54 l 45·82	l 46·41 l 47·65 l 46·20	l 45·42 l 46·79 l 45·01	l 47·13 l 46·50 l 47·32	l 44·64 l 44·01 l 45·77	l 45·90 l 47·32 l 45·43	l 46·84 l 45·63 l 46·16 d 45·51	l 46·61 l 46·35 l 45·60	l 45·78 l 45·76 l 46·33	l 47·14 l 45·27 l 47·78 l 46·23	$M = 46''·14$ $w = 20·34$ $\frac{1}{w} = 0·05$ $C = 67° 58' 46''·14$
	46·10	46·75	45·74	46·98	44·81	46·22	46·04	46·19	45·96	46·61	
XL (Kulamangalam) and XXXVII (Kárakkurchi)	l 3·48 l 2·87 l 4·29	l 1·68 l 3·81 l 1·78 l 1·84	l 4·37 l 1·58 l 3·59 l 3·08	l 3·73 l 2·06 l 2·92	l 6·63 l 4·63 l 5·39	l 3·31 l 3·48 l 4·18	l 4·66 l 5·00 l 4·28 d 3·95	l 3·81 l 2·77 l 3·19	l 1·69 l 3·68 l 3·10 l 3·02	l 3·72 l 1·94 l 3·12	$M = 3''·46$ $w = 9·66$ $\frac{1}{w} = 0·10$ $C = 68° 20' 3''·46$
	3·55	2·28	3·16	2·90	5·55	3·66	4·47	3·26	2·87	2·93	

At XXXVIII (Merpanaikád)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXIX (Rĕtavayal)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
XXXVII (Kárakkurchi) and XXXVI (Kalúrunikád)	l 29·40 l 28·11 l 29·23	l 27·25 l 27·19 l 28·56	l 27·84 l 29·70 l 28·31	l 27·95 l 26·27 l 27·44	l 26·75 l 25·77 l 25·70	l 25·89 l 27·27 l 26·02	l 27·43 l 25·86 l 26·08	l 28·64 l 27·50 l 28·21	l 29·07 l 28·96 l 28·00 l 28·80	l 26·38 l 27·14 l 27·37	$M = 27''\cdot51$ $w = 8\cdot32$ $\frac{1}{w} = 0\cdot12$ $C = 50° 51' 27''\cdot51$
	28·91	27·67	28·62	27·22	26·07	26·39	26·46	28·12	28·71	26·96	
XXXVI (Kalúrunikád) and XXXIX (Rĕtavayal)	l 29·20 l 27·49 l 28·65	l 26·50 l 27·99 l 25·80	l 28·58 l 29·37 l 29·22	l 29·37 l 29·50 l 28·86	l 31·44 l 30·68 l 31·18	l 28·34 l 28·09 l 29·99	l 26·91 l 29·14 l 27·61	l 29·14 l 28·94 l 30·67	l 27·79 l 29·42 l 28·59	l 31·52 l 30·08 l 31·74	$M = 29''\cdot06$ $w = 5\cdot20$ $\frac{1}{w} = 0\cdot19$ $C = 62° 45' 29''\cdot06$
	28·45	26·76	29·06	29·24	31·10	28·81	27·89	29·58	28·60	31·11	

At XXXIX (Rĕtavayal)

February 1877 ; *observed by Captain T. T. Carter, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLI (Mánúr)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0′	180° 0′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 36′	316° 49′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
XLI (Mánúr) and XXXVIII (Merpanaikád)	l 23·88 l 22·76 l 23·54	l 23·66 l 24·22 l 24·50	l 22·12 l 21·62 l 20·55	l 23·01 l 23·60 l 22·14	l 24·89 l 24·32 l 23·06	l 23·37 l 22·92 l 22·05	l 23·19 l 23·86 l 22·52 l 24·19	l 23·00 l 20·99 l 23·31	l 23·06 l 21·90 l 22·54	l 22·88 l 21·58 l 23·09	$M = 22''\cdot96$ $w = 12\cdot25$ $\frac{1}{w} = 0\cdot08$ $C = 69° 31' 22''\cdot96$
	23·39	24·13	21·43	22·92	24·09	22·78	23·44	22·43	22·50	22·52	
XXXVIII (Merpanaikád) and XXXVI (Kalúrunikád)	l 58·96 l 57·78 l 58·61	l 58·26 l 57·44 l 57·27	l 58·86 l 57·12 l 59·38	l 57·61 l 57·96 l 56·02	l 57·78 l 56·52 l 58·27	l 56·95 l 58·59 l 58·01	l 59·47 l 58·58 l 60·14 l 58·34	l 57·46 l 60·04 l 58·61	l 58·39 l 58·92 l 58·22	l 59·48 l 59·89 l 58·99	$M = 58''\cdot29$ $w = 14\cdot59$ $\frac{1}{w} = 0\cdot07$ $C = 73° 23' 58''\cdot30$
	58·45	57·66	58·45	57·20	57·52	57·85	59·13	58·70	58·51	59·45	

At XL (Kulamangalam)

January 1877; *observed by Captain T. T. Carter, R.E., and Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXVII (Kárakkurchi)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	153° 53′	333° 53′	233° 6′	53° 6′	312° 17′	132° 17′	31° 29′	211° 29′	110° 42′	290° 42′	
XXXVII (Kárakkurchi) and XXXVIII (Merpanaikád)	″ l 3·02 l 5·09 l 4·59	″ l 2·22 l 3·60 l 3·71	″ l 5·69 l 2·38 l 2·28 l 1·81 l 2·57	″ l 1·95 l 1·41 l 1·04 l 1·96	″ l 2·27 l 3·13 l 2·31	″ l 1·88 l 2·26 l 3·34	″ l 1·82 l 1·88 l 2·76	″ l 2·94 l 2·96 l 2·75	″ l 3·28 l 1·02 l 1·77 l 2·46	″ l 1·29 l 2·34 l 2·08 l 1·63	M = 2″·60 w = 13·34 1/w = 0·07 C = 76° 27′ 2″·59
	4·23	3·18	2·95	1·59	2·57	2·49	2·15	2·88	2·13	1·84	
XXXVIII (Merpanaikád) and XLII (Pallathivayal)	l 45·17 l 44·74 l 43·79	l 45·93 l 43·41 l 45·57 l 45·53	l 45·05 l 45·84 l 45·92	l 45·84 l 45·19 l 45·24	l 47·06 l 47·94 l 48·54	l 47·25 l 46·02 l 46·10	l 46·13 l 46·21 l 44·79	l 46·52 l 45·49 l 45·17	l 44·93 l 46·22 l 45·34	l 46·74 l 46·25 l 45·88	M = 45″·82 w = 11·04 1/w = 0·09 C = 77° 25′ 45″·82
	44·57	45·11	45·60	45·42	47·85	46·46	45·71	45·73	45·50	46·29	

At XLI (Mánúr)

January 1877; *observed by Captain T. T. Carter, R.E., and Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIV (Kánád)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	226° 7′	46° 7′	305° 18′	125° 18′	24° 29′	204° 29′	103° 42′	283° 42′	182° 54′	2° 54′	
XLIV (Kánád) and XLIII (Ŏkkúr)	″ l 26·79 l 28·26 l 27·03	″ l 28·04 l 28·56 l 28·02	″ l 27·53 l 28·32 l 27·83	″ l 29·44 l 28·85 l 30·75	″ l 26·91 l 28·81 l 27·83 l 29·02 l 28·02	″ l 27·92 l 27·87 l 28·80	″ l 29·05 l 28·32 l 28·39	″ l 28·64 l 27·73 l 28·40	″ l 29·90 l 29·44 l 29·57	″ l 26·67 l 27·68 l 27·90	M = 28″·34 w = 13·96 1/w = 0·07 C = 49° 23′ 28″·34
	27·36	28·21	27·89	29·68	28·12	28·20	28·59	28·26	29·64	27·42	
XLIII (Ŏkkúr) and XLII (Pallathivayal)	l 51·01 l 51·41 l 50·98	l 53·58 l 50·55 l 52·62 l 51·52	l 53·60 l 52·23 l 52·53	l 52·78 l 52·61 l 52·57	l 51·53 l 50·80 l 51·85	l 52·52 l 51·04 l 50·40	l 51·76 l 51·26 l 51·31	l 50·14 l 51·50 l 49·63	l 48·89 l 49·27 l 49·79	l 52·40 l 50·88 l 52·72	M = 51″·45 w = 8·22 1/w = 0·12 C = 62° 26′ 51″·45
	51·13	52·07	52·79	52·65	51·39	51·32	51·44	50·42	49·32	52·00	
XLII (Pallathivayal) and XXXVIII (Merpanaikád)	l 60·36 l 61·20 l 61·46	l 60·07 l 60·90 l 60·89	l 59·41 l 61·71 l 59·64	l 61·12 l 60·30 l 59·88	l 60·69 l 62·72 l 60·16	l 58·97 l 59·64 l 60·75	l 60·46 l 61·25 l 60·97	l 60·48 l 60·06 l 62·31	l 61·12 l 62·15 l 60·03	l 60·24 l 59·66 l 59·50	M = 60″·60 w = 21·70 1/w = 0·05 C = 68° 36′ 0″·60
	61·01	60·62	60·25	60·43	61·19	59·79	60·89	60·95	61·10	59·80	

At XLI (Mánúr)—(*Continued*).

Angle between	Circle readings, telescope being set on XLIV (Kánád) 226° 7′	46° 7′	305° 18′	125° 18	24° 29′	204° 29′	103° 42′	283° 42′	182° 54′	2° 54′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXVIII (Merpanaikád) and XXXIX (Rĕtavayal)	l 51·00 l 52·28 l 50·53	l 51·18 l 49·94 l 52·27	l 50·58 l 50·92 l 51·26	l 52·15 l 49·56 h 51·15	l 51·23 l 51·87 l 51·42	l 52·56 l 51·26 l 52·63	l 50·07 l 52·01 l 52·94 l 51·04	l 52·88 l 53·29 l 53·42	l 49·25 l 50·63 l 51·11	l 52·64 l 52·81 l 52·84	$M = 51''·57$ $w = 10·45$ $\frac{1}{w} = 0·10$ $C = 45° 38' 51''·57$
	51·27	51·13	50·92	50·95	51·51	52·15	51·52	53·20	50·33	52·76	

At XLII (Pallathivayal)

January 1877; *observed by Captain T. T. Carter, R.E., and Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XL (Kulamangalam) 211° 38′	31° 38′	290° 49′	110° 49′	10° 1′	190° 1′	89° 9′	269° 9′	168° 26′	348° 26′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XL (Kulamangalam) and XXXVIII (Merpanaikád)	l 26·22 l 27·53 l 27·92	l 28·27 l 27·78 l 26·04	l 26·82 l 26·56 l 28·00	l 28·52 l 30·59 l 29·04	l 27·69 l 28·17 l 28·98	l 26·74 l 28·43 l 28·00	l 28·44 l 28·33 l 27·30	l 27·61 l 26·96 l 29·46 l 28·62	l 30·60 l 29·16 l 28·48	l 29·13 l 28·40 l 27·96	$M = 28''·12$ $w = 11·67$ $\frac{1}{w} = 0·09$ $C = 34° 35' 28''·12$
	27·22	27·36	27·13	29·38	28·28	27·72	28·02	28·16	29·41	28·50	
XXXVIII (Merpanaikad) and XLI (Mánúr)	l 32·17 l 33·39 l 31·07	l 32·05 l 32·43 l 34·14	l 33·55 l 33·82 l 32·40	l 31·99 l 32·87 l 33·69	l 32·70 l 32·45 l 30·71	l 36·12 l 32·54 l 33·54 l 35·09 l 34·02	l 31·79 l 30·72 l 33·40 l 32·32	l 33·58 l 31·91 l 31·97	l 31·38 l 32·24 l 32·51	l 34·82 l 32·90 l 33·78 l 30·50 l 33·64 l 32·34	$M = 32''·70$ $w = 12·53$ $\frac{1}{w} = 0·08$ $C = 66° 9' 32''·73$
	32·21	32·87	33·26	32·85	31·95	34·26	32·06	32·49	32·04	33·00	
XLI (Mánúr) and XLIII (Ŏkkúr)	l 49·56 l 47·11 l 49·52	l 48·11 l 49·06 l 48·48	l 48·01 l 48·91 l 48·62	l 48·08 l 47·10 l 46·30	l 50·72 l 49·64 l 49·69	l 47·81 l 49·16 l 49·28	l 47·41 l 49·75 l 48·54	l 49·28 l 48·83 l 49·21	l 48·87 l 49·50 l 49·31	l 48·58 l 46·25 l 48·80 l 49·26	$M = 48''·69$ $w = 13·80$ $\frac{1}{w} = 0·07$ $C = 74° 8' 48''·69$
	48·73	48·55	48·51	47·16	50·02	48·75	48·57	49·11	49·23	48·22	
XLIII (Ŏkkúr) and XLV (Sembalavayal)	l 3·01 l 6·94 l 5·39 l 4·92 l 5·48	l 4·81 l 4·74 l 4·54	l 6·22 l 5·09 l 5·98	l 4·23 l 6·77 l 4·74 l 5·43	l 4·61 l 5·63 l 4·06	l 3·79 l 4·08 l 5·08 l 4·29	l 5·41 l 4·15 l 4·05	l 6·25 l 4·89 l 4·76	l 3·60 l 3·79 l 3·33	l 5·40 l 4·46 l 4·52	$M = 4''·82$ $w = 18·75$ $\frac{1}{w} = 0·05$ $C = 36° 43' 4''·82$
	5·15	4·70	5·76	5·29	4·77	4·31	4·54	5·30	3·57	4·79	

At XLIII (Ŏkkúr)

January 1877; *observed by Captain T. T. Carter, R.E., and Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLV (Sembalavayal) 0° 2′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 48′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XLV (Sembalavayal) and XLII (Pallathivayal)	″ *l* 20·53 *l* 21·36 *l* 23·20 *l* 21·56	″ *l* 20·48 *l* 19·67 *l* 21·60	″ *h* 19·03 *h* 22·98 *l* 19·95 *l* 20·48	″ *l* 20·62 *l* 18·55 *l* 21·49	″ *l* 20·89 *l* 20·63 *l* 21·70 *d* 21·90	″ *l* 21·31 *l* 20·72 *d* 20·28 *d* 19·13	″ *l* 18·55 *l* 20·15 *l* 21·13	″ *l* 20·53 *l* 20·62 *l* 20·20	″ *l* 20·70 *l* 20·83 *l* 21·80	″ *l* 19·78 *l* 20·47 *l* 20·23	$M = 20''·64$ $w = 18·34$ $\frac{1}{w} = 0·05$ $C = 80° 20′ 20''·65$
	21·66	20·58	20·61	20·22	21·28	20·36	19·94	20·45	21·11	20·16	
XLII (Pallathivayal) and XLI (Mánúr)	*l* 20·06 *l* 19·41 *l* 18·71 *l* 18·46	*l* 17·51 *l* 18·06 *l* 19·09	*h* 18·64 *h* 19·97 *l* 19·14 *l* 19·05	*l* 17·26 *l* 18·60 *l* 19·08 *d* 19·84	*l* 17·90 *l* 18·01 *l* 18·85 *d* 19·08	*l* 18·92 *l* 19·48 *d* 18·46 *d* 17·31	*l* 22·00 *l* 18·49 *l* 21·96 *l* 20·48	*l* 18·37 *l* 20·18 *l* 19·74 *l* 17·17	*l* 20·48 *l* 19·77 *l* 20·40	*l* 19·72 *l* 19·15 *l* 18·88	$M = 19''·14$ $w = 12·09$ $\frac{1}{w} = 0·08$ $C = 43° 24′ 19''·14$
	19·16	18·22	19·20	18·70	18·46	18·54	20·73	18·87	20·22	19·25	
XLI (Mánúr) and XLIV (Kánád)	*l* 30·29 *l* 34·70 *l* 32·45 *l* 33·07	*l* 35·08 *l* 35·26 *l* 35·69	*h* 31·46 *h* 34·02 *l* 31·93 *l* 32·57	*l* 36·52 *l* 33·23 *l* 35·42 *d* 36·59	*l* 27·93 *l* 31·06 *l* 30·89	*l* 33·84 *l* 34·87 *l* 33·13	*l* 30·38 *l* 33·80 *l* 30·26 *l* 30·33	*l* 34·54 *l* 31·56 *l* 31·16 *l* 36·92 *l* 34·13 *l* 34·30	*l* 32·63 *l* 33·11 *l* 32·33	*l* 33·29 *l* 33·77 *l* 33·14	$M = 33''·09$ $w = 2·97$ $\frac{1}{w} = 0·34$ $C = 65° 12′ 33''·09$
	32·63	35·34	32·50	35·44	29·96	33·95	31·19	33·77	32·69	33·40	
XLIV (Kánád) and XLVI (Sirukambúr)	*l* 58·95 *l* 57·76 *l* 59·20	*l* 60·32 *l* 59·68 *l* 59·58	*h* 59·52 *h* 62·91 *l* 59·31 *l* 60·42	*l* 58·83 *l* 59·51 *l* 60·53	*l* 61·57 *l* 61·47 *l* 61·94	*l* 60·44 *l* 59·22 *l* 59·89	*l* 60·12 *l* 59·81 *l* 59·03	*l* 58·91 *l* 59·14 *l* 59·66 *l* 58·99	*l* 62·52 *l* 60·07 *l* 60·27	*l* 60·00 *l* 59·78 *l* 59·88	$M = 59''·98$ $w = 10·88$ $\frac{1}{w} = 0·09$ $C = 65° 10′ 59''·98$
	58·64	59·86	60·54	59·62	61·66	59·85	59·65	59·18	60·95	59·89	
XLVI (Sirukambúr) and XLVII (Manikamkota)	*l* 37·22 *l* 38·22 *l* 37·38	*l* 35·57 *l* 34·96 *l* 33·88 *d* 35·97	*h* 37·50 *h* 37·89 *l* 34·92 *l* 36·61	*l* 35·67 *l* 36·19 *l* 34·23	*l* 35·57 *l* 35·81 *l* 34·82	*l* 33·76 *l* 33·96 *l* 34·60	*l* 36·75 *l* 37·59 *l* 36·74	*l* 37·15 *l* 35·95 *l* 37·08 *d* 38·13	*l* 35·10 *l* 35·23 *l* 35·89	*l* 35·71 *l* 37·40 *l* 34·26	$M = 35''·96$ $w = 7·19$ $\frac{1}{w} = 0·14$ $C = 41° 53′ 35''·96$
	37·61	35·10	36·73	35·36	35·40	34·11	37·03	37·08	35·41	35·79	
XLVII (Manikamkota) and XLV (Sembalavayal)	*l* 10·03 *l* 9·39 *l* 9·32	*l* 10·75 *l* 9·69 *l* 9·48 *d* 11·14	*h* 9·22 *h* 12·36 *l* 12·69 *l* 12·03	*l* 9·96 *l* 11·85 *l* 10·02	*l* 11·62 *l* 11·14 *l* 12·47	*l* 10·45 *l* 12·95 *l* 10·36	*l* 10·61 *l* 9·00 *l* 11·00	*l* 11·00 *l* 12·41 *l* 10·26 *d* 12·62	*l* 10·68 *l* 8·46 *l* 10·44 *l* 10·05	*l* 10·51 *l* 9·64 *l* 11·37	$M = 10''·72$ $w = 12·04$ $\frac{1}{w} = 0·08$ $C = 63° 58′ 10''·72$
	9·58	10·27	11·58	10·61	11·74	11·25	10·20	11·57	9·91	10·51	

At XLIV (Kánád)

January 1877; *observed by Captain T. T. Carter, R.E., and Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLVI (Sirukambúr) 0° 2′	180° 1′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLVI (Sirukambúr) and XLIII (Ókkúr)	″ l 55·62 l 54·52 l 54·79	″ l 53·75 l 53·55 l 53·94	″ l 54·47 l 54·64 l 54·07	″ l 52·83 l 53·46 l 54·15	″ l 53·68 l 54·08 l 53·75	″ l 54·50 l 56·22 l 54·64	″ l 55·95 l 53·64 l 53·38	″ l 54·82 l 55·42 l 54·32	″ l 54·74 l 54·18 l 55·08	″ l 54·36 l 52·54 l 54·49	$M = 54''\cdot32$ $w = 21\ \cdot70$ $\frac{1}{w} = 0\ \cdot05$ $C = 66^\circ\,52'\,54''\cdot32$
	54·98	53·75	54·39	53·48	53·84	55·12	54·32	54·85	54·67	53·80	
XLIII (Ókkúr) and XLI (Mánúr)	l 61·09 l 61·87 l 61·09	l 60·03 l 61·24 l 60·10	l 60·29 l 58·78 l 60·52	l 59·33 l 60·98 l 60·14	l 61·01 l 60·20 l 61·06	l 61·74 l 61·91 l 61·79	l 60·82 l 59·16 l 59·92	l 60·17 l 59·70 l 60·42	l 60·73 l 60·94 l 59·66	l 59·77 l 61·44 l 60·31	$M = 60''\cdot54$ $w = 20\ \cdot80$ $\frac{1}{w} = 0\ \cdot05$ $C = 65^\circ\,24'\,0''\cdot54$
	61·35	60·46	59·86	60·15	60·76	61·81	59·97	60·10	60·44	60·51	

At XLV (Sembalavayal)

December 1876; *observed by Captain T. T. Carter, R.E., and Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLII (Pallathivayal) 62° 58′	242° 58′	142° 9′	322° 9′	221° 20′	41° 20′	300° 33′	120° 33′	19° 45′	199° 45′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLII (Pallathivayal) and XLIII (Ókkúr)	″ h 31·31 h 35·34 h 32·67 l 34·21	″ l 33·87 l 33·56 l 35·77	″ l 36·87 l 33·89 l 34·47	″ l 34·90 l 35·42 l 33·64	″ h 35·52 h 33·69 h 34·79	″ h 37·06 h 35·33 h 34·55 h 35·11	″ l 34·28 l 34·72 l 34·42	″ l 33·68 l 34·71 l 35·68	″ l 33·59 l 34·99 l 35·81	″ l 33·52 l 34·91 l 33·47	$M = 34''\cdot56$ $w = 15\ \cdot60$ $\frac{1}{w} = 0\ \cdot06$ $C = 62^\circ\,56'\,34''\cdot56$
	33·38	34·40	35·08	34·65	34·67	35·51	34·47	34·69	34·80	33·97	
XLIII (Ókkúr) and XLVII (Manikamkota)	h 11·36 h 12·97 h 11·28	l 10·68 l 11·12 l 12·21	l 12·24 l 11·82 l 12·39	l 11·56 l 12·70 l 12·17	h 10·11 h 10·92 h 12·45 h 12·56	h 12·23 h 11·84 h 9·54 h 13·45	l 10·91 l 12·40 l 12·84	l 11·08 l 10·22 l 10·37	l 11·53 l 12·04 l 10·33	l 11·10 l 12·29 l 12·36	$M = 11''\cdot66$ $w = 21\ \cdot92$ $\frac{1}{w} = 0\ \cdot05$ $C = 79^\circ\,11'\,11''\cdot66$
	11·87	11·34	12·15	12·14	11·51	11·77	12·05	10·56	11·30	11·92	

At XLVI (Sirukambúr)

February 1876; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIX (Nambudalai)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	220° 31′	40° 31′	299° 43′	119° 42′	18° 55′	198° 55′	98° 7′	278° 7′	177° 19′	357° 19′	
	″	″	″	″	″	″	″	″	″	″	
XLIX (Nambudalai) and XLVIII (Manĕgandi)	l 2·58	l 2·73	l 3·68	l 4·17	l 3·15	l 3·15	l 2·49	l 1·60	l 2·44	l 1·27	$M = 2''·64$
	l 2·63	l 1·64	l 1·36	l 1·83	l 2·63	l 3·97	l 4·62	l 3·65	l 2·77	l 3·28	$w = 22·20$
	l 2·30	l 1·35	l 1·49	l 2·38	l 2·23	l 2·65	l 3·92	l 2·73	l 2·14	l 2·25	$\frac{1}{w} = 0·05$
	2·50	1·91	2·18	2·79	2·67	3·26	3·68	2·66	2·45	2·27	$C = 37° 50' 2''·64$
XLVIII (Manĕgandi) and XLVII (Manikamkota)	l 48·61	l 50·67	l 50·28	l 49·78	l 50·35	l 48·37	l 49·39	l 48·68	l 50·69	l 49·26	$M = 49''·54$
	l 48·80	l 50·44	l 50·23	l 50·37	l 48·30	l 48·65	l 48·03	l 47·95	l 49·12	l 47·89	$w = 12·20$
	l 50·16	l 51·53	l 51·00	l 51·13	l 48·29	l 48·98	l 49·18	l 49·82	l 50·13	l 50·17	$\frac{1}{w} = 0·08$
	49·19	50·88	50·50	50·43	48·98	48·67	48·87	48·82	49·98	49·11	$C = 67° 11' 49''·54$
XLVII (Manikamkota) and XLIII (Ŏkkúr)	l 56·23	l 57·14	l 58·16	l 56·31	l 57·66	l 57·89	l 57·19	l 58·14	l 56·34	l 57·44	$M = 57''·38$
	l 57·57	l 56·25	l 58·57	l 57·37	l 59·87	l 57·63	l 56·79	l 58·31	l 57·89	l 58·42	$w = 10·10$
	l 54·96	l 57·01	l 57·81	l 54·69	l 59·20	l 57·56	l 55·97	l 57·47	l 58·65	l 57·02	$\frac{1}{w} = 0·10$
	56·25	56·80	58·18	56·12	58·91	57·69	56·65	57·97	57·63	57·63	$C = 67° 31' 57''·38$
XLIII (Ŏkkúr) and XLIV (Kánád)	l 6·49	l 4·80	l 6·36	l 6·17	l 4·94	l 4·98	l 4·50	l 7·44	l 5·03	l 4·95	$M = 5''·34$
	l 5·86	l 5·91	l 3·56	l 3·49	l 4·80	l 6·05	l 4·31	l 5·26	l 5·83	l 6·12	$w = 19·60$
	l 4·12	l 3·89	l 5·60	l 4·77	l 5·95	l 5·69	l 6·53	l 6·69	l 3·96	l 6·25	$\frac{1}{w} = 0·05$
	5·49	4·87	5·17	4·81	5·23	5·57	5·11	6·46	4·94	5·77	$C = 47° 56' 5''·34$

At XLVII (Manikamkota)

February 1876; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLV (Sembalavayal)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	225° 24′	45° 24′	304° 36′	124° 36′	23° 48′	203° 48′	103° 0′	283° 0′	182° 12′	2° 12′	
	″	″	″	″	″	″	″	″	″	″	
XLV (Sembalavayal) and XLIII (Ŏkkúr)	l 35·53	l 37·07	l 37·35	l 36·26	l 36·32	l 35·08	l 37·16	l 36·55	l 36·93	l 35·26	$M = 36''·61$
	l 36·62	l 36·63	l 38·14	l 36·65	l 37·81	l 35·84	l 37·10	l 37·87	l 35·80	l 35·82	$w = 16·90$
	l 36·47	l 37·68	l 37·04	l 36·53	l 37·63	l 35·17	l 36·29	l 37·09	l 37·09	l 35·63	$\frac{1}{w} = 0·06$
	36·21	37·13	37·51	36·48	37·25	35·36	36·85	37·17	36·61	35·57	$C = 36° 50' 36''·61$

At XLVII (Manikamkota)—(*Continued*).

Angle between	Circle readings, telescope being set on XLV (Sembalavayal) 225° 24′	45° 24′	304° 36′	124° 36′	23° 48′	203° 48′	103° 0′	283° 0′	182° 12′	2° 12′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XLIII (Ŏkkúr) and XLVI (Sirukambúr)	l 26·36	l 26·50	l 27·71	l 27·79	l 25·59	l 27·92	l 26·43	l 25·36	l 28·65	l 26·45	M = 26″·86
	l 28·29	l 26·89	l 26·10	l 28·31	l 25·71	l 26·69	l 25·56	l 25·14	l 28·59	l 26·47	w = 9·70
	l 26·03	l 25·14	l 27·06	l 27·39	l 26·24	l 27·68	l 27·15	l 25·68	l 28·48	l 28·47	$\frac{1}{w}$ = 0·10
	26·89	26·18	26·96	27·83	25·85	27·43	26·38	25·39	28·57	27·13	C = 70° 34′ 26″·86
XLVI (Sirukambúr) and XLVIII (Manĕgandi)	l 4·41	l 6·60	l 5·40	l 4·38	l 7·16	l 6·43	l 5·06	l 6·74	l 4·30	l 6·51	M = 5″·58
	l 6·24	l 5·02	l 4·05	l 5·94	l 6·32	l 4·69	l 5·59	l 5·20	l 5·77	l 7·08	w = 21·30
	l 5·68	l 7·33	l 6·08	l 4·50	l 5·70	l 5·57	l 5·73	l 4·55	l 5·12	l 4·21	$\frac{1}{w}$ = 0·05
	5·44	6·32	5·18	4·94	6·39	5·56	5·46	5·50	5·06	5·93	C = 68° 31′ 5″·58
XLVIII (Manĕgandi) and L (Vĕnniyúr)	l 58·94	l 57·27	l 59·63	l 59·70	l 58·32	l 59·22	l 57·24	l 59·06	l 58·06	l 59·28	M = 59″·20
	l 58·77	l 57·27	l 61·00	l 58·55	l 59·06	l 59·36	l 59·47	l 61·08	l 59·24	l 60·94	w = 12·00
	l 59·09	l 58·47	l 59·64	l 60·95	l 58·68	l 59·77	l 59·30	l 60·02	l 58·35	l 60·28	$\frac{1}{w}$ = 0·08
	58·93	57·67	60·09	59·73	58·69	59·45	58·67	60·05	58·55	60·17	C = 49° 26′ 59″·20

At XLVIII (Manĕgandi)

February 1876; *observed by Major B. R. Branfill with Troughton and Simms'*
24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLVII (Manikamkota) 0° 2′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XLVII (Manikamkota) and XLVI (Sirukambúr)	l 4·40	h 7·19	l 4·68	l 5·98	l 5·03	l 5·11	l 5·26	l 6·03	l 2·76	l 5·14	M = 5″·35
	l 4·63	h 8·47	l 4·18	l 7·12	l 4·63	l 4·99	l 4·53	l 4·82	l 5·03	l 5·32	w = 7·24
	l 5·60	h 7·62	l 5·35	l 7·28	l 4·44	l 5·32	h 4·81	l 4·39	l 5·68	l 2·56	$\frac{1}{w}$ = 0·14
									h 7·42		
	4·88	7·76	4·74	6·79	4·70	5·14	4·87	5·08	5·22	4·34	C = 44° 17′ 5″·35
XLVI (Sirukambúr) and XLIX (Nambudalai)	l 25·75	h 23·35	l 25·58	l 26·40	l 26·34	l 27·50	l 24·85	l 26·95	l 25·86	l 27·59	M = 26″·14
	l 26·80	h 24·34	l 25·93	l 25·98	l 26·91	l 26·06	l 25·60	l 25·85	l 24·96	l 26·10	w = 13·82
	l 26·13	h 25·30	l 27·69	l 25·08	l 26·33	l 26·57	h 27·16	l 26·40	l 25·87	l 28·24	$\frac{1}{w}$ = 0·07
		h 24·73							h 26·14		
	26·23	24·43	26·40	25·82	26·53	26·71	25·87	26·40	25·71	27·31	C = 72° 4′ 26″·13

At XLVIII (Manĕgandi)—(*Continued*).

Angle between	Circle readings, telescope being set on XLVII (Manikamkota)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
XLIX (Nambudalai) and LI (Ūrannankudi)	l 42·84 l 42·42 l 42·66	h 46·13 h 44·36 h 44·18	l 42·14 l 42·89 l 40·20	l 41·63 l 41·25 l 43·25	l 42·85 l 42·66 l 42·10	l 41·66 l 42·35 l 42·51	l 44·09 l 42·74 h 44·58	l 42·22 l 42·86 l 42·36	l 44·13 l 44·40 l 42·26 h 44·09	l 41·22 l 42·57 l 41·44	$M = 42''\cdot78$ $w = 8\cdot12$ $\frac{1}{w} = 0\cdot12$ $C = 67^\circ 15' 42''\cdot78$
	42·64	44·89	41·74	42·04	42·54	42·17	43·80	42·48	43·72	41·74	
LI (Ūrannankudi) and LII (Mutupatnam)	l 4·24 l 5·14 l 4·75	h 1·54 h 2·71 h 2·71	l 6·15 l 6·19 l 5·98	l 4·06 l 5·62 l 3·55	l 4·75 l 4·59 l 6·04	l 5·02 l 4·96 l 3·44	l 5·03 l 5·76 h 5·07	l 4·44 l 4·23 l 4·83	l 3·92 l 4·54 l 6·18 h 5·13	l 4·78 l 3·82 l 5·48	$M = 4''\cdot66$ $w = 9\cdot53$ $\frac{1}{w} = 0\cdot10$ $C = 47^\circ 6' 4''\cdot66$
	4·71	2·32	6·11	4·41	5·13	4·47	5·29	4·50	4·94	4·69	
LII (Mutupatnam) and L (Vĕnniyúr)	l 9·08 l 7·76 l 8·14	h 8·21 h 7·84 h 9·38	l 6·28 l 7·09 l 6·83	l 7·05 l 6·70 l 7·97	l 6·97 l 6·96 l 6·61	l 6·66 l 6·73 l 6·13	l 5·48 l 8·00 h 7·29	l 5·64 l 7·79 l 7·23	l 5·31 l 6·70 l 6·44 h 6·67	l 7·75 l 9·21 l 6·82	$M = 7''\cdot22$ $w = 13\cdot56$ $\frac{1}{w} = 0\cdot07$ $C = 63^\circ 48' 7''\cdot22$
	8·33	8·48	6·73	7·24	6·85	6·51	6·92	6·89	6·28	7·93	
L (Vĕnniyúr) and XLVII (Manikamkota)	l 32·66 l 33·19 l 32·96	h 32·77 h 32·92 h 32·17	l 34·68 l 33·54 l 33·62	l 34·29 l 32·74 l 33·36	l 33·71 l 34·10 l 34·04	l 34·39 l 34·54 l 35·53	l 34·11 l 33·20 h 33·82	l 35·13 l 33·82 l 33·27	l 35·49 l 34·01 l 34·37 h 32·03	l 33·90 l 33·54 l 35·70	$M = 33''\cdot79$ $w = 17\cdot33$ $\frac{1}{w} = 0\cdot06$ $C = 65^\circ 28' 33''\cdot79$
	32·94	32·62	33·95	33·46	33·95	34·82	33·71	34·07	33·98	34·38	

At XLIX (Nambudalai)

***February* 1876; *observed by Major B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on LI (Ūrannankudi)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2′	180° 1′	79° 13′	259° 12′	158° 24′	338° 23′	237° 37′	57° 36′	316° 50′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
LI (Ūrannankudi) and XLVIII (Manĕgandi)	h 12·44 h 14·73 h 13·91	h 14·97 h 13·23 h 12·94	l 13·48 l 13·92 l 12·69	l 14·30 l 12·82 l 13·96	l 13·93 l 13·54 l 13·33	l 15·40 l 13·87 l 12·87	h 16·39 h 15·03 l 13·69	l 13·58 l 13·90 l 13·85	l 13·21 l 13·08 l 14·37	l 14·18 l 13·93 l 12·15	$M = 13''\cdot79$ $w = 23\cdot30$ $\frac{1}{w} = 0\cdot04$ $C = 76^\circ 20 13''\cdot79$
	13·69	13·71	13·36	13·69	13·60	14·05	15·04	13·78	13·55	13·42	

At XLIX (Nambudalai)—(*Continued*).

Angle between	Circle readings, telescope being set on LI (Ūrannankudi) 0° 2′	180° 1′	79° 13′	259° 12′	158° 24′	338° 23′	237° 37′	57° 36′	316° 50′	136° 49′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XLVIII (Manĕgandi) and XLVI (Sirukambúr)	″ h 31·48 h 32·69 h 31·19	″ h 33·01 h 30·07 h 30·59	″ l 31·38 l 32·55 l 32·38	″ l 32·02 l 31·96 l 31·70	″ l 32·18 l 32·24 l 32·46	″ l 31·10 l 32·34 l 31·63	″ h 30·74 h 30·63 l 30·39	″ l 31·58 l 30·85 l 31·20	″ l 31·79 l 31·40 l 31·17	″ l 32·18 l 32·47 l 33·22	$M = 31''·69$ $w = 22·20$ $\frac{1}{w} = 0·05$ $C = 70° 5' 31''·69$
	31·79	31·22	32·10	31·89	32·29	31·69	30·59	31·21	31·45	32·62	

At L (Vĕnniyúr)

February 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLVII (Manikamkota) 135° 33′	315° 33′	214° 45′	34° 45′	293° 57′	113° 57′	13° 9′	193° 14′	92° 22′	272° 22′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XLVII (Manikamkota) and XLVIII (Manĕgandi)	″ l 26·27 l 26·21 l 25·85	″ l 24·74 l 27·23 l 25·32	″ l 27·53 l 27·16 l 26·02	″ l 27·53 l 27·52 l 25·52	″ l 29·09 l 27·11 l 29·63	″ l 28·76 l 29·21 l 30·52	″ h 25·37 h 26·55 h 26·40	″ h 26·92 l 26·17 l 26·77	″ l 27·81 l 28·40 l 28·08	″ l 27·10 l 27·41 l 27·13	$M = 27''·18$ $w = 6·20$ $\frac{1}{w} = 0·16$ $C = 65° 4' 27''·18$
	26·11	25·76	26·90	26·86	28·61	29·50	26·11	26·62	28·10	27·21	
XLVIII (Manĕgandi) and LII (Mutupatnam)	l 61·01 l 60·42 l 58·70	l 58·54 l 56·90 l 58·48	l 57·59 l 59·68 l 58·26	l 56·98 l 56·98 l 58·81	l 58·22 l 58·05 l 57·65	l 58·44 l 55·79 l 56·10	h 59·20 h 59·01 h 58·65	h 57·93 l 58·03 l 59·37	l 58·74 l 58·46 l 59·43	l 58·81 l 60·98 l 58·61	$M = 58''·46$ $w = 9·00$ $\frac{1}{w} = 0·11$ $C = 70° 27' 58''·46$
	60·04	57·97	58·51	57·59	57·97	56·78	58·95	58·44	58·88	59·47	

At LI (Ūrannankudi)

March 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LIV (Pŏragudi) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 49′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
LIV (Pŏragudi) and LIII (Kŏdikulam)	″ l 44·25 l 43·60 l 43·79	″ l 46·00 l 46·35 l 44·74	″ l 45·31 l 44·24 l 44·66	″ l 46·78 l 45·36 l 46·17	″ l 45·57 l 44·27 l 45·40	″ h 43·82 h 43·26 h 44·53	″ l 45·73 l 44·31 l 46·44 l 45·92	″ l 44·10 l 44·97 l 46·02	″ l 46·51 l 46·43 l 45·32	″ l 44·76 l 43·18 l 45·59	$M = 45''·06$ $w = 12·26$ $\frac{1}{w} = 0·08$ $C = 30° 7' 45''·06$
	43·88	45·70	44·74	46·10	45·08	43·87	45·60	45·03	46·09	44·51	

At LI (Úrannankudi)—(*Continued*).

Angle between	Circle readings, telescope being set on LIV (Pŏragudi)										M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
LIII (Kŏdikulam) and LII (Mutupatnam)	l 50·09	l 52·34	l 49·49	l 49·60	l 48·89	h 50·21	l 49·63	l 50·00	l 49·48	l 49·23	$M = 49''\cdot90$
	l 50·52	l 51·24	l 49·03	l 49·76	l 51·25	h 49·21	l 48·17	l 49·66	l 49·45	l 50·99	$w = 15\cdot47$
	l 50·14	l 51·12	l 48·51	l 48·89	l 48·41	h 50·18	l 50·21	l 50·52	l 49·97	l 50·85	$\frac{1}{w} = 0\cdot06$
							l 49·36				
	50·25	51·57	49·01	49·42	49·52	49·87	49·34	50·06	49·63	50·36	$C = 71° 7' 49''\cdot90$
LII (Mutupatnam) and XLVIII (Manĕgandi)	l 28·24	l 28·12	l 27·45	l 27·55	l 29·61	h 28·02	l 28·04	l 29·54	l 30·84	l 29·83	$M = 28''\cdot93$
	l 28·24	l 28·72	l 29·54	l 28·74	l 27·65	h 28·04	l 30·46	l 29·07	l 31·36	l 28·74	$w = 13\cdot60$
	l 29·20	l 28·63	l 29·20	l 29·12	l 30·58	h 29·10	l 28·71	l 28·26	l 29·86	l 26·92	$\frac{1}{w} = 0\cdot07$
							l 29·82				
	28·56	28·49	28·73	28·47	29·28	28·39	29·26	28·96	30·69	28·50	$C = 67° 55' 28''\cdot93$
XLVIII (Manĕgandi) and XLIX (Nambudalai)	l 4·63	l 2·16	l 4·07	l 3·71	l 2·45	h 4·73	l 2·94	l 3·10	l 1·50	l 4·06	$M = 3''\cdot40$
	l 3·38	l 2·96	l 4·27	l 3·74	l 3·17	h 3·37	l 2·34	l 4·17	l 1·00	l 4·16	$w = 12\cdot80$
	l 4·27	l 2·84	l 3·72	l 2·88	l 3·58	h 4·78	l 2·79	l 4·50	l 2·63	l 4·04	$\frac{1}{w} = 0\cdot08$
	4·09	2·65	4·02	3·44	3·07	4·29	2·69	3·92	1·71	4·09	$C = 36° 24' 3''\cdot40$

At LII (Mutupatnam)

March 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on L (Vĕnniyúr)										M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	0° 0′	180° 0′	79° 13′	259° 13′	158° 25′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
L (Vĕnniyúr) and XLVIII (Manĕgandi)	l 53·65	l 54·59	l 53·97	l 55·16	l 52·70	l 52·50	l 53·57	l 53·36	l 55·06	l 54·80	$M = 54''\cdot03$
	l 53·17	l 54·69	l 53·09	l 55·55	l 54·02	l 51·74	l 53·87	l 55·93	l 54·90	l 54·33	$w = 12\cdot70$
	l 52·98	l 55·19	l 52·98	l 53·64	l 53·71	l 53·58	l 56·12	l 53·48	l 54·78	l 53·81	$\frac{1}{w} = 0\cdot08$
	53·27	54·82	53·35	54·78	53·48	52·61	54·52	54·26	54·91	54·31	$C = 45° 43' 54''\cdot03$
XLVIII (Manĕgandi) and LI (Úrannankudi)	l 24·87	l 25·33	l 25·07	l 28·88	l 27·33	l 29·07	l 27·56	l 26·13	l 25·49	l 26·98	$M = 26''\cdot69$
	l 27·61	l 25·15	l 25·59	l 26·00	l 28·38	l 28·63	l 27·77	l 25·16	l 26·90	l 28·91	$w = 4\cdot80$
	l 24·23	l 25·57	l 26·30	l 28·20	l 27·92	l 29·86	l 25·60	l 23·65	l 26·37	l 26·28	$\frac{1}{w} = 0\cdot21$
	25·57	25·35	25·65	27·69	27·88	29·19	26·98	24·98	26·25	27·39	$C = 64° 58' 26''\cdot69$

At LII (Mutupatnam)—(*Continued*).

Angle between	Circle readings, telescope being set on L (Vĕnniyúr) 0°0′	180°0′	79°18′	259°13′	158°25′	338°24′	237°37′	57°37′	316°49′	136°49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LI (Urannankudi) and LIII (Kŏdikulam)	l 27·84	l 27·83	l 29·08	l 25·49	l 28·86	l 27·73	l 29·33	l 27·50	l 29·33	l 29·69	$M = 28''\cdot22$
	l 29·40	l 27·77	l 28·54	l 28·99	l 27·32	l 27·54	l 28·63	l 27·36	l 28·86	l 26·55	$w = 10\cdot70$
	l 28·68	l 29·73	l 28·81	l 26·47	l 26·84	l 25·80	l 30·42	l 29·96	l 28·03	l 28·03	$\frac{1}{w} = 0\cdot09$
	l 28·80										
	28·68	28·44	28·81	26·98	27·67	27·02	29·46	28·27	28·74	28·09	$C = 66^\circ\, 32'\, 28''\cdot22$
LIII (Kŏdikulam) and LV (Náyanárkoil)	l 45·71	l 47·24	l 46·60	l 45·51	l 47·79	l 44·69	l 43·64	l 45·42	l 46·15	l 43·82	$M = 45''\cdot79$
	l 46·25	l 46·74	l 46·95	l 45·26	l 47·44	l 46·73	l 43·60	l 47·50	l 44·60	l 45·27	$w = 6\cdot41$
	l 46·32	l 44·94	l 47·50	l 44·85	l 47·06	l 44·84	l 43·30	l 46·97	l 45·80	l 44·41	$\frac{1}{w} = 0\cdot16$
	l 46·97										
	46·31	46·31	47·02	45·21	47·43	45·42	43·51	46·63	45·52	44·50	$C = 39^\circ\, 2'\, 45''\cdot79$

At LIII (Kŏdikulam)

March 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LIV (Pŏragudi) 0°1′	180°1′	79°18′	259°18′	158°25′	338°25′	237°37′	57°37′	316°49′	136°49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LIV (Pŏragudi) and LVI (Ramnad)	l 35·11	l 35·66	l 35·92	l 34·89	l 35·17	l 36·93	l 34·26	l 35·99	l 35·57	l 36·37	$M = 35''\cdot50$
	l 37·05	l 36·11	l 35·08	l 35·01	l 35·34	l 34·73	l 37·10	l 35·43	l 35·71	l 34·24	$w = 28\cdot60$
	l 34·89	l 36·67	l 35·24	l 34·08	l 35·87	l 35·78	l 36·02	l 35·76	l 34·27	l 34·91	$\frac{1}{w} = 0\cdot03$
	35·68	36·15	35·41	34·66	35·46	35·81	35·79	35·73	35·18	35·17	$C = 79^\circ\, 39'\, 35''\cdot50$
LVI (Ramnad) and LVII (Sambuttiyendal)	l 31·10	l 31·49	l 29·78	l 33·69	l 33·13	l 33·14	l 31·51	l 30·81	l 32·18	l 32·72	$M = 31''\cdot90$
	l 30·53	l 32·00	l 31·15	l 33·73	l 31·47	l 35·02	l 30·72	l 31·69	l 32·53	l 33·29	$w = 6\cdot10$
	l 31·27	l 31·57	l 29·47	l 33·10	l 33·34	l 33·20	l 29·61	l 31·79	l 30·08	l 31·96	$\frac{1}{w} = 0\cdot16$
	30·97	31·69	30·13	33·51	32·65	33·79	30·61	31·43	31·60	32·66	$C = 48^\circ\, 48'\, 31''\cdot90$
LVII (Sambuttiyendal) and LV (Náyanárkoil)	l 33·25	l 34·81	l 35·46	l 32·53	l 35·18	l 35·59	l 36·67	l 37·50	l 37·59	l 35·99	$M = 35''\cdot40$
	l 32·78	l 35·84	l 33·02	l 32·91	l 35·90	l 35·29	l 35·84	l 36·06	l 35·28	l 36·19	$w = 5\cdot10$
	l 34·35	l 35·13	l 35·75	l 34·52	l 34·73	l 34·58	l 37·78	l 37·32	l 37·99	l 36·21	$\frac{1}{w} = 0\cdot20$
	33·46	35·26	34·74	33·32	35·27	35·15	36·76	36·96	36·95	36·13	$C = 67^\circ\, 40'\, 35''\cdot40$

At LIII (Kŏdikulam)—(*Continued*).

Angle between	Circle readings, telescope being set on LIV (Pŏragudi) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LV (Náyanárkoil) and LII (Mutupatnam)	l 18·57	l 16·50	l 16·35	l 17·36	l 13·72	l 12·91	l 13·83	l 13·97	l 13·56	l 13·74	$M = 15''\cdot20$
	l 18·14	l 15·91	l 17·67	l 17·03	l 14·12	l 14·03	l 13·42	l 14·73	l 15·50	l 15·03	$w = 4\cdot50$
	l 16·14	l 15·45	l 15·53	l 15·62	l 13·28	l 13·98	l 14·24	l 13·36	l 16·02	l 16·27	$\frac{1}{w} = 0\cdot22$
	17·62	15·95	16·52	16·67	13·71	13·64	13·83	14·02	15·03	15·01	$C = 70° 4' 15''\cdot20$
LII (Mutupatnam) and LI (Ūrannankudi)	l 43·15	l 45·11	l 43·80	l 41·95	l 43·93	l 45·12	l 45·44	l 46·27	l 45·22	l 43·93	$M = 44''\cdot51$
	l 44·83	l 46·22	l 43·60	l 43·03	l 44·32	l 43·70	l 46·07	l 43·88	l 44·42	l 43·99	$w = 11\cdot90$
	l 44·88	l 45·43	l 44·00	l 44·06	l 44·88	l 45·70	l 44·83	l 43·90	l 46·15	l 43·34	$\frac{1}{w} = 0\cdot08$
	44·29	45·59	43·80	43·01	44·38	44·84	45·45	44·68	45·26	43·75	$C = 42° 19' 44''\cdot51$
LI (Ūrannankudi) and LIV (Pŏragudi)	l 15·93	l 15·05	l 16·64	l 18·32	l 19·50	l 16·73	l 15·65	l 16·74	l 15·54	l 17·12	$M = 16''\cdot90$
	l 17·42	l 15·36	l 19·21	l 18·20	l 17·47	l 16·66	l 15·27	l 18·49	l 16·47	l 17·31	$w = 6\cdot53$
	l 18·48	l 15·73	l 17·74	l 17·77	l 18·37	l 16·14	l 16·56	l 17·34	l 13·81	l 15·49	$\frac{1}{w} = 0\cdot15$
			l 18·53								
	17·28	15·38	18·03	18·10	18·45	16·51	15·83	17·52	15·27	16·64	$C = 51° 27' 16''\cdot90$

At LIV (Pŏragudi)

March 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LVI (Ramnad) 165° 0′	345° 0′	244° 13′	64° 13′	323° 24′	143° 24′	42° 36′	222° 36′	121° 49′	301° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LVI (Ramnad) and LIII (Kŏdikulam)	l 55·28	l 53·73	l 54·35	l 54·23	l 54·43	l 53·50	l 54·53	l 52·95	l 53·81	l 53·57	$M = 54''\cdot05$
	l 55·98	l 53·63	l 53·50	l 53·45	l 55·44	l 53·20	l 52·22	l 54·05	l 54·87	l 53·82	$w = 17\cdot20$
	l 53·96	l 54·96	l 52·35	l 53·14	l 53·80	l 53·07	l 54·90	l 54·26	l 56·28	l 54·06	$\frac{1}{w} = 0\cdot06$
	55·07	54·11	53·40	53·61	54·56	53·26	53·88	53·75	54·99	53·82	$C = 66° 34' 54''\cdot05$
LIII (Kŏdikulam) and LI (Ūrannankudi)	l 56·28	l 56·42	l 56·55	l 56·76	l 56·80	l 56·72	l 57·92	l 57·97	l 55·99	l 57·91	$M = 57''\cdot13$
	l 56·04	l 55·99	l 57·24	l 57·07	l 57·25	l 58·36	l 57·87	l 57·57	l 56·59	l 57·07	$w = 19\cdot60$
	l 57·85	l 56·07	l 57·61	l 56·62	l 57·91	l 58·24	l 58·94	l 57·17	l 56·24	l 56·87	$\frac{1}{w} = 0\cdot05$
	56·72	56·16	57·13	56·82	57·32	57·77	58·24	57·57	56·27	57·28	$C = 98° 24' 57''\cdot13$

At LV (Náyanárkoil)

May 1876; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LII (Mutupatnam)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	
	″	″	″	″	″	″	″	″	″	″	
LII (Mutupatnam) and LIII (Kōdikulam)	l 58·79 l 59·40 l 59·20	l 58·99 l 60·24 l 60·08	l 59·88 l 59·74 l 59·37	l 59·33 l 59·97 l 59·35	l 60·29 l 60·80 l 58·89	l 60·61 l 58·93 l 60·34	l 58·96 l 59·96 l 59·32	l 60·41 l 60·56 l 61·45	l 57·86 l 58·25 l 58·70	l 59·95 l 57·06 l 58·78	M = 59″·52 w = 15 ·60 $\frac{1}{w}$ = 0 ·06 C = 70° 52′ 59″·52
	59·13	59·77	59·66	59·55	59·99	59·96	59·41	60·81	58·27	58·60	
LIII (Kōdikulam) and LVII (Sambuttiyendal)	l 14·88 l 13·99 l 13·49	l 14·11 l 12·72 l 12·11	l 13·36 l 14·72 l 15·15	l 14·27 l 13·01 l 13·44	l 12·40 l 14·33 l 15·22	l 11·73 l 13·57 l 13·59	l 13·44 l 11·29 l 11·35	l 11·20 l 12·20 l 11·70	l 12·01 l 12·11 l 14·01	l 12·09 l 13·89 l 12·76	M = 13″·14 w = 9 ·90 $\frac{1}{w}$ = 0 ·10 C = 69° 5′ 13″·14
	14·12	12·98	14·41	13·57	13·98	12·96	12·03	11·70	12·71	12·91	

At LVI (Ramnad)

* *March* 1875; *and* †*April* 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LIX (Kánjarangudi)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	96° 42′	276° 42′	175° 37′	355° 38′	254° 49′	74° 49′	334° 1′	154° 2′	53° 14′	233° 14′	
	″	″	″	″	″	″	″	″	″	″	
* LIX (Kánjarangudi) and LVIII (Uttarakoshamangai)	l 49·75 l 48·16 l 50·15	l 47·57 l 47·82 l 48·92	l 48·89 l 49·33 l 48·02	l 49·30 l 48·45 l 48·43	l 50·79 l 49·34 l 49·78	l 49·22 l 48·96 l 48·57	l 49·13 l 50·88 l 50·36	l 48·43 l 47·00 l 48·80	l 48·43 l 50·45 l 49·57	l 47·58 l 47·77 l 47·12	M = 48″·90 w = 11 ·80 $\frac{1}{w}$ = 0 ·08 C = 53° 21′ 48″·90
	49·35	48·10	48·75	48·73	49·97	48·92	50·12	48·08	49·48	47·49	
* LVIII (Uttarakoshamangai) and LVII (Sambuttiyendal)	l 50·13 l 50·23 h 49·55	l 49·30 l 48·75 l 48·22	l 49·92 l 49·56 l 48·52	l 48·74 l 48·71 l 48·77	l 48·34 l 48·99 l 47·85	l 47·89 l 47·37 l 47·90	l 47·65 l 46·55 l 47·76	l 49·09 l 48·49 l 48·64	l 46·63 l 46·80 l 48·72	l 50·35 l 48·75 l 50·38	M = 48″·62 w = 10 ·20 $\frac{1}{w}$ = 0 ·10 C = 43° 2′ 48″·62
	49·97	48·76	49·33	48·74	48·39	47·72	47·32	48·74	47·38	49·83	
	Circle readings, telescope being set on LVII (Sambuttiyendal)										
	106° 26′	286° 26′	185° 38′	5° 38′	264° 50′	84° 50′	344° 2′	164° 2′	63° 15′	243° 15′	
	″	″	″	″	″	″	″	″	″	″	
† LVII (Sambuttiyendal) and LIII (Kōdikulam)	l 54·32 l 54·54 l 53·25	l 54·27 l 53·50 l 54·52	l 51·66 l 53·76 l 52·47	l 53·51 l 53·30 l 53·50	l 53·96 l 52·27 l 54·61	l 52·62 l 53·34 l 52·95	l 53·17 l 51·97 l 53·17	l 52·85 l 54·28 l 52·89	l 54·84 l 55·74 l 54·87	l 53·75 l 53·24 l 52·13	M = 53″·51 w = 14 ·10 $\frac{1}{w}$ = 0 ·07 C = 72° 39′ 53″·51
	54·04	54·10	52·63	53·44	53·61	52·97	52·77	53·34	55·15	53·04	

At LVI (Ramnad)—(*Continued*).

Angle between	Circle readings, telescope being set on LVII (Sambuttiyendal) 106° 26′	286° 26′	185° 38′	5° 38′	264° 50′	84° 50′	344° 2′	164° 2′	63° 15′	243° 15′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† LIII (Kŏdikulam) and LIV (Pŏragudi)	″ l 29·99 l 30·25 l 31·53	″ l 30·28 l 31·48 l 30·59	″ l 32·21 l 31·26 l 31·23	″ l 30·47 l 30·79 l 31·13	″ l 31·61 l 33·10 l 30·58	″ l 29·70 l 30·32 l 29·83	″ l 31·64 l 32·84 l 32·77	″ l 33·20 l 32·84 l 33·10	″ l 28·96 l 31·03 l 31·33	″ l 32·45 l 31·67	$M = 31''\cdot34$ $w = 9\cdot04$ $\frac{1}{w} = 0\cdot11$ $C = 33^\circ 45' 31''\cdot34$
	30·59	30·78	31·57	30·80	31·76	29·95	32·42	33·05	30·44	32·06	

At LVII (Sambuttiyendal)

‡ *March* 1875; *and* § *May* 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LV (Náyanárkoil) 101° 46′	281° 47′	180° 59′	0° 59′	260° 10′	80° 10′	339° 23′	159° 23′	58° 35′	238° 35′	M = Mean of Groups w = Relative Weight C = Concluded Angle
§ LV (Náyanárkoil) and LIII (Kŏdikulam)	″ l 10·68 l 10·42 l 12·73	″ l 10·69 l 11·23 l 12·89	″ l 13·08 l 12·44 l 12·59	″ l 10·72 l 11·23 l 9·79	″ l 12·33 l 10·92 l 13·64	″ l 8·78 l 8·61 l 11·66	″ l 12·31 l 10·99 l 11·55	″ l 11·52 l 14·74 h 11·99	″ h 12·82 h 13·21 h 12·49	″ h 12·61 h 12·34 h 13·58	$M = 11''\cdot82$ $w = 6\cdot90$ $\frac{1}{w} = 0\cdot14$ $C = 43^\circ 14' 11''\cdot82$
	11·28	11·60	12·70	10·58	12·30	9·68	11·62	12·75	12·84	12·84	
§ LIII (Kŏdikulam) and LVI (Ramnad)	l 37·20 l 36·45 l 36·07	l 37·23 l 36·43 l 34·46	l 36·04 l 37·32 l 35·82	l 37·71 l 36·52 l 38·19	l 36·88 l 38·92 l 35·10	l 38·00 l 37·46 l 35·96	l 36·68 l 38·58 l 37·51	l 35·88 h 35·90 h 36·83	h 36·26 h 34·67 h 36·10	h 36·25 h 38·37 h 36·01	$M = 36''\cdot69$ $w = 14\cdot90$ $\frac{1}{w} = 0\cdot07$ $C = 58^\circ 31' 36''\cdot69$
	36·57	36·04	36·39	37·47	36·97	37·14	37·59	36·20	35·68	36·88	

Angle between	Circle readings, telescope being set on LVI (Ramnad) 131° 35′	311° 36′	210° 47′	30° 48′	289° 59′	109° 59′	9° 12′	189° 12′	88° 24′	268° 25′	
‡ LVI (Ramnad) and LVIII (Uttarakoshamangai)	″ l 9·65 l 8·82 l 9·19	″ l 10·23 l 10·24 l 9·07	″ l 11·97 l 11·13 l 9·88	″ l 13·02 l 10·70 l 10·32	″ l 10·46 l 10·06 l 10·17	″ l 11·43 l 11·15 l 12·44	″ l 12·23 l 10·22 l 11·72	″ l 11·30 l 11·01 l 11·21	″ l 9·38 l 10·55 l 9·63	″ l 11·03 l 11·63 l 10·93	$M = 10''\cdot69$ $w = 11\cdot90$ $\frac{1}{w} = 0\cdot08$ $C = 51^\circ 40' 10''\cdot69$
	9·22	9·85	10·99	11·35	10·23	11·67	11·39	11·17	9·85	11·20	
‡ LVIII (Uttarakoshamangai) and LXII (Arapoth)	l 32·88 l 33·03 l 34·24	l 31·32 l 33·11 l 32·49	l 29·74 l 31·07 l 31·25	l 30·08 l 33·80 l 31·82	l 34·20 l 34·68 l 32·58	l 32·97 l 32·82 l 31·34	l 33·75 l 32·82 l 32·49	l 33·11 l 32·82 l 32·64	l 33·92 l 32·96 l 33·24	l 33·19 l 33·89 l 34·02	$M = 32''\cdot74$ $w = 9\cdot10$ $\frac{1}{w} = 0\cdot11$ $C = 79^\circ 54' 32''\cdot74$
	33·38	32·31	30·69	31·90	33·82	32·38	33·02	32·86	33·37	33·70	

At LVIII (Uttarakoshamangai)

March 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXI (Tanichanthai) 0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXI (Tanichanthai) and LXII (Arapoth)	l 16·65	l 17·31	h 16·80	l 17·65	l 17·73	l 16·56	l 16·14	l 16·62	l 17·69	l 17·08	$M = 16''·91$
	l 16·84	l 16·60	l 17·05	l 18·18	l 16·47	l 16·53	l 16·75	l 16·59	l 17·95	l 17·52	$w = 27·80$
	l 15·26	l 16·48	l 15·86	l 16·73	l 17·04	l 15·20	l 17·31	l 18·19	h 16·90	l 17·65	$\frac{1}{w} = 0·04$
	16·25	16·80	16·57	17·52	17·08	16·10	16·73	17·13	17·51	17·42	$C = 41° 27' 16''·91$
LXII (Arapoth) and LVII (Sambuttiyendal)	l 1·55	l 2·29	h 1·91	l 2·20	l 1·25	l 1·18	l 1·34	l 1·26	l 2·34	l 1·42	$M = 1''·74$
	l 1·30	l 2·01	l 2·80	l 2·10	l 1·97	l 1·43	l 1·14	l 1·91	l 0·11	l 1·15	$w = 28·60$
	l 0·29	l 2·78	l 3·12	l 2·80	l 1·84	l 2·41	l 1·54	l 1·65	l 1·21	l 1·94	$\frac{1}{w} = 0·03$
	1·05	2·36	2·61	2·37	1·69	1·67	1·34	1·61	1·22	1·50	$C = 62° 20' 1''·74$
LVII (Sambuttiyendal) and LVI (Ramnad)	l 61·38	l 61·81	h 61·67	l 61·35	l 61·85	l 62·10	l 60·64	l 62·23	l 60·53	l 61·08	$M = 61''·40$
	l 62·36	l 60·96	h 60·88	l 62·18	l 60·98	l 62·17	l 61·10	l 61·57	l 61·50	l 61·47	$w = 29·40$
	l 62·80	l 59·98	l 61·37	l 62·06	l 61·62	l 61·47	l 60·23	l 60·94	l 60·09	l 61·46	$\frac{1}{w} = 0·03$
	62·18	60·92	61·31	61·86	61·48	61·91	60·66	61·58	60·71	61·34	$C = 85° 17' 1''·40$
LVI (Ramnad) and LIX (Kánjarangudi)	l 41·47	l 41·44	h 40·71	l 41·94	l 40·21	l 40·29	l 41·31	l 38·20	l 40·77	l 41·30	$M = 40''·91$
	l 41·38	l 41·35	h 41·19	l 40·55	l 39·99	l 40·67	l 40·74	l 40·96	l 41·45	l 40·79	$w = 17·90$
	l 41·28	l 41·99	l 42·13	l 41·09	l 40·10	l 41·98	l 41·30	l 39·20	h 41·84	h 39·70	$\frac{1}{w} = 0·06$
	41·38	41·59	41·34	41·19	40·10	40·98	41·12	39·45	41·35	40·60	$C = 75° 33' 40''·91$
LIX (Kánjarangudi) and LX (Yervádi)	l 42·95	l 42·13	h 43·96	l 41·65	l 43·99	l 45·44	l 45·16	l 45·76	l 43·74	l 42·76	$M = 43''·62$
	l 43·32	l 43·34	h 43·49	l 43·54	l 44·87	l 43·85	l 45·32	l 43·92	l 42·05	l 42·10	$w = 8·70$
	l 42·59	l 43·36	l 42·75	l 43·05	l 43·22	l 44·46	l 44·96	l 45·65	h 42·57	h 42·65	$\frac{1}{w} = 0·11$
	42·95	42·94	43·40	42·75	44·03	44·58	45·15	45·11	42·79	42·50	$C = 52° 9' 43''·62$
LX (Yervádi) and LXI (Tanichanthai)	l 14·07	l 13·54	h 13·98	l 15·08	l 15·02	l 14·60	l 15·04	l 14·77	l 15·90	l 16·49	$M = 14''·85$
	l 15·28	l 14·85	h 14·02	l 14·15	l 15·05	l 15·03	l 13·11	l 14·74	l 16·11	l 17·11	$w = 14·90$
	l 15·28	l 14·90	l 14·18	l 14·75	l 14·29	l 13·83	l 13·70	l 15·98	h 14·99	l 15·76	$\frac{1}{w} = 0·07$
	14·88	14·43	14·06	14·66	14·79	14·49	13·95	15·16	15·67	16·45	$C = 43° 12' 14''·85$

At LIX (Kánjarangudi)

March 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LX (Yervádi) 109° 36′	289° 36′	188° 47′	8° 47′	267° 59′	87° 59′	347° 11′	167° 11′	66° 24′	246° 24′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LX (Yervádi) and LVIII (Uttarakoshamangai)	l 44·08	l 44·78	l 44·58	h 43·05	l 45·45	l 44·09	l 45·24	l 44·80	l 42·93	l 42·53	$M = 44''·18$
	l 44·38	l 44·33	l 44·75	h 43·41	l 45·22	l 43·46	l 45·27	l 44·29	l 43·78	l 42·71	$w = 15·60$
	l 45·03	l 43·91	l 45·16	h 44·04	l 45·55	l 43·36	h 44·33	l 43·38	l 43·81	l 43·69	$\frac{1}{w} = 0·06$
	44·50	44·34	44·83	43·50	45·41	43·64	44·95	44·16	43·51	42·98	$C = 58° 29' 44''·18$

At LIX (Kánjarangudi)—(*Continued*).

Angle between	Circle readings, telescope being set on LX (Yervádi) 109° 36′	289° 36′	188° 47′	8° 47′	267° 59′	87° 59′	347° 11′	167° 11′	66° 24′	246° 24′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LVIII (Uttarakoshamangai) and LVI (Ramnad)	l 29·72	l 30·20	l 30·57	h 31·76	l 31·57	l 30·52	l 30·71	l 30·57	l 31·92	l 31·22	$M = 30''\cdot63$
	l 30·52	l 29·82	l 30·40	h 29·52	l 31·03	l 30·64	l 30·04	l 31·77	l 31·59	l 30·84	$w = 28\cdot60$
	l 31·15	l 28·99	l 29·76	h 30·51	l 29·47	l 31·44	h 30·63	l 30·00	l 31·09	l 30·93	$\frac{1}{w} = 0\cdot03$
	30·46	29·67	30·24	30·60	30·69	30·87	30·46	30·78	31·53	31·00	$C = 51° \; 4' \; 30''\cdot63$

At LX (Yervádi)

March 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXI (Tanichanthai) 0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXI (Tanichanthai) and LVIII (Uttarakoshamangai)	l 45·76	l 45·15	l 44·94	l 45·85	l 45·47	l 44·96	l 44·13	l 44·19	l 46·00	l 44·71	$M = 44''\cdot83$
	l 44·86	l 45·45	l 45·55	l 45·31	l 43·80	l 44·25	l 45·47	l 43·11	l 43·91	l 42·91	$w = 15\cdot90$
	l 46·27	l 44·94	l 44·59	l 44·88	l 44·45	l 45·94	l 44·21	l 42·89	l 46·49	l 44·28	$\frac{1}{w} = 0\cdot06$
	45·63	45·18	45·03	45·35	44·57	45·05	44·60	43·40	45·47	43·97	$C = 99° \; 25' \; 44''\cdot83$
LVIII (Uttarakoshamangai) and LIX (Kánjarangudi)	l 31·23	l 32·30	l 32·53	l 31·10	l 31·58	l 31·72	l 32·19	l 31·40	l 32·54	l 33·12	$M = 32''\cdot02$
	l 33·29	l 32·71	l 32·97	l 30·97	l 31·91	l 31·51	l 30·89	l 31·50	l 32·19	l 31·69	$w = 37\cdot00$
	l 32·02	l 31·15	l 32·29	l 32·07	l 32·52	l 31·94	l 31·71	l 32·69	l 31·62	l 33·20	$\frac{1}{w} = 0\cdot03$
	32·18	32·05	32·60	31·38	32·00	31·72	31·60	31·86	32·12	32·67	$C = 69° \; 20' \; 32''\cdot02$

At LXI (Tanichanthai)

February 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXIV (Ōpilán) 0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXIV (Ōpilán) and LXIII (Kadaládi)	l 7·59	l 8·03	l 7·68	h 8·83	l 8·55	l 8·09	h 7·27	l 7·12	l 6·78	l 6·19	$M = 7''\cdot57$
	l 7·76	l 6·26	l 7·03	l 7·90	l 6·47	l 8·52	l 8·70	l 6·75	l 8·16	l 6·91	$w = 18\cdot20$
	l 7·18	l 7·42	h 6·25	l 8·96	h 7·58	l 9·49	l 7·56	l 7·28	h 7·90	l 6·76	$\frac{1}{w} = 0\cdot05$
	7·51	7·24	6·99	8·56	7·53	8·70	7·84	7·05	7·61	6·62	$C = 38° \; 48' \; 7''\cdot57$
LXIII (Kadaládi) and LXII (Arapoth)	l 42·97	l 40·86	l 41·58	h 43·00	l 41·05	l 42·12	h 40·70	l 41·96	l 43·51	l 43·40	$M = 41''\cdot77$
	l 40·56	l 41·96	h 42·62	l 42·73	l 41·11	l 41·08	h 40·74	l 41·87	h 42·89	l 42·19	$w = 18\cdot20$
	l 42·21	l 41·41	l 42·11	l 41·27	h 42·42	l 40·54	l 40·69	l 41·01	l 42·42	l 40·17	$\frac{1}{w} = 0\cdot05$
	41·91	41·41	42·10	42·33	41·53	41·25	40·71	41·61	42·94	41·92	$C = 73° \; 58' \; 41''\cdot77$

At LXI (Tanichanthai)—(*Continued*).

Angle between	Circle readings, telescope being set on LXIV (Ōpilán) 0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXII (Arapoth)	l 11·96	l 13·36	l 12·53	h 9·72	l 10·20	l 12·64	h 13·19	l 10·99	l 13·14	l 12·37	$M = 12''\cdot21$
and	l 12·29	l 13·87	h 12·41	l 10·57	l 13·59	l 13·63	h 12·15	l 11·60	h 10·13	l 10·96	$w = 13\cdot64$
LVIII (Uttarakoshamangai)	l 12·80	l 11·32	l 11·65	l 11·81	h 12·68	l 12·55	l 13·45	l 12·73	l 11·96	l 13·20	$\frac{1}{w} = 0\cdot07$
										l 13·40	
	12·35	12·85	12·20	10·70	12·16	12·94	12·93	11·77	11·74	12·48	$C = 62^\circ 39' 12''\cdot21$
LVIII (Uttarakoshamangai)	l 60·88	l 60·68	l 62·01	h 59·50	l 61·67	l 58·98	h 58·39	l 60·78	l 59·92	l 60·28	$M = 60''\cdot21$
and	l 61·45	l 59·53	h 61·41	l 59·37	l 59·40	l 60·52	h 60·07	l 60·90	l 60·81	l 60·09	$w = 13\cdot30$
LX (Yervádi)	l 59·98	l 61·19	l 61·72	l 58·25	h 59·08	l 59·61	l 59·95	l 61·05	l 59·66	l 59·21	$\frac{1}{w} = 0\cdot08$
	60·77	60·47	61·71	59·04	60·05	59·70	59·47	60·91	60·13	59·86	$C = 37^\circ 22' 0''\cdot21$

At LXII (Arapoth)

March 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LVII (Sambuttiyendal) 211° 40′	31° 41′	290° 51′	110° 52′	10° 9′	190° 9′	89° 16′	269° 16′	168° 28′	348° 29′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LVII (Sambuttiyendal)	l 27·58	l 27·34	l 26·52	h 29·36	l 27·02	l 29·07	l 26·50	l 27·74	l 27·50	l 27·56	$M = 27''\cdot30$
and	l 26·39	l 26·40	l 25·88	h 27·89	l 27·24	l 27·64	l 26·56	l 27·43	l 26·81	l 26·99	$w = 15\cdot40$
LVIII (Uttarakoshamangai)	l 26·36	l 26·58	l 27·12	h 28·41	l 28·01	l 28·71	l 27·20	l 28·37	l 27·18	l 25·76	$\frac{1}{w} = 0\cdot06$
	26·78	26·77	26·51	28·55	27·42	28·47	26·75	27·85	27·16	26·77	$C = 37^\circ 45' 27''\cdot30$
LVIII (Uttarakoshamangai)	h 32·25	l 32·06	l 33·02	l 33·40	h 32·96	l 32·89	l 31·35	l 32·73	h 31·30	l 32·70	$M = 32''\cdot16$
and	h 31·53	l 31·55	l 31·93	l 31·47	h 33·54	l 31·29	l 31·91	l 32·91	l 31·77	l 30·55	$w = 18\cdot90$
LXI (Tanichanthai)	l 30·09	l 31·12	l 32·76	l 32·41	l 33·23	l 33·13	l 30·90	l 32·27	l 32·85	l 33·03	$\frac{1}{w} = 0\cdot05$
	31·29	31·58	32·57	32·43	33·24	32·44	31·39	32·64	31·97	32·09	$C = 75^\circ 53' 32''\cdot16$
LXI (Tanichanthai)	h 20·70	l 20·86	l 21·33	l 23·36	h 23·02	l 24·12	l 21·34	l 21·54	h 21·36	l 23·41	$M = 22''\cdot06$
and	l 22·16	l 20·74	l 21·51	l 21·10	h 21·76	l 22·77	l 22·09	l 22·43	l 22·54	l 23·88	$w = 17\cdot20$
LXIII (Kadaládi)	l 22·19	l 22·50	l 21·21	l 21·60	h 22·03	l 22·63	l 22·30	l 20·51	l 23·33	l 21·36	$\frac{1}{w} = 0\cdot06$
	21·68	21·37	21·35	22·02	22·27	23·17	21·91	21·49	22·41	22·88	$C = 63^\circ 13' 22''\cdot06$
LXIII (Kadaládi)	h 21·16	l 19·75	l 20·72	l 18·29	h 20·49	l 18·61	l 19·76	l 18·87	l 17·37	l 20·57	$M = 19''\cdot82$
and	l 18·77	l 20·35	l 19·57	l 19·82	h 21·33	l 18·35	l 19·59	l 20·53	l 19·33	l 19·77	$w = 12\cdot30$
LXV (Kidátirukai)	l 21·26	l 18·33	l 20·67	l 19·64	h 21·74	l 20·23	l 20·12	l 20·58	l 18·61	l 20·51	$\frac{1}{w} = 0\cdot08$
	20·40	19·48	20·32	19·25	21·19	19·06	19·82	19·99	18·44	20·28	$C = 34^\circ 46' 19''\cdot82$

At LXIII (Kadaládi)

February 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXVI (Taraigudi) 0° 2′	180° 2′	79° 13′	259° 13′	158° 26′	338° 26′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVI (Taraigudi) and LXVII (Pulápati)	″ l 34·71 l 35·17 l 34·96	″ l 36·39 l 36·10 l 35·91	″ l 36·94 l 36·79 l 36·01	″ l 36·99 l 35·67 l 35·81	″ l 35·53 l 34·48 h 34·47	″ h 37·07 l 35·64 l 37·75	″ l 35·47 l 35·30 l 34·99	″ l 35·74 h 33·99 l 35·58	″ l 36·01 l 36·95 l 35·79	″ l 36·08 l 35·38 l 35·37	$M = 35''\cdot 77$ $w = 16\ \cdot 70$ $\frac{1}{w} = 0\ \cdot 06$ $C = 39^\circ\ 26'\ 35''\cdot 77$
	34·95	36·13	36·58	36·16	34·83	36·82	35·25	35·10	36·25	35·61	
LXVII (Pulápati) and LXV (Kidátirukai)	l 14·92 l 16·49 l 16·44	l 14·59 l 15·79 l 15·02	h 18·98 l 15·88 l 16·54 l 16·28	l 15·30 l 16·41 l 16·01	l 15·89 l 17·23 h 18·50	h 17·67 l 16·23 l 17·60	l 16·36 l 15·70 l 17·35	l 17·65 l 17·66 h 17·07	l 16·59 l 16·24 l 16·17	l 15·59 l 15·03 l 14·69	$M = 16''\cdot 37$ $w = 11\ \cdot 45$ $\frac{1}{w} = 0\ \cdot 09$ $C = 57^\circ\ 35'\ 16''\cdot 37$
	15·95	15·13	16·92	15·91	17·21	17·17	16·47	17·46	16·33	15·10	
LXV (Kidátirukai) and LXII (Arapoth)	l 9·70 l 6·86 l 7·72	l 8·69 l 8·68 l 8·62	l 6·14 l 8·01 l 7·72	l 8·41 l 7·33 l 8·39	l 7·12 l 6·76 h 8·01	l 7·62 l 6·93 l 8·15	l 10·57 l 10·66 l 9·07	l 9·35 l 9·66 h 7·74	l 6·95 l 7·60 l 9·17	l 7·80 l 9·02 l 8·45	$M = 8''\cdot 23$ $w = 11\ \cdot 00$ $\frac{1}{w} = 0\ \cdot 09$ $C = 75^\circ\ 22'\ 8''\cdot 23$
	8·09	8·66	7·29	8·04	7·30	7·57	10·10	8·92	7·91	8·42	
LXII (Arapoth) and LXI (Tanichanthai)	l 55·97 l 56·89 l 58·26	l 55·80 l 55·52 l 56·11	l 56·51 l 57·45 l 56·79	l 56·59 l 56·67 l 56·63	l 57·19 l 55·44 h 55·01	l 57·77 l 56·37 l 54·30	l 54·94 l 55·55 l 56·93	l 56·64 l 56·15 l 55·79	l 58·47 l 56·62 l 56·84	l 58·45 l 57·15 l 55·35	$M = 56''\cdot 47$ $w = 17\ \cdot 20$ $\frac{1}{w} = 0\ \cdot 06$ $C = 42^\circ\ 47'\ 56''\cdot 47$
	57·04	55·81	56·92	56·63	55·88	56·15	55·81	56·19	57·31	56·98	
LXI (Tanichanthai) and LXIV (Ōpilán)	l 23·45 l 23·21 l 22·11	l 22·19 l 22·45 l 21·92	l 21·42 l 23·31 l 23·25	l 22·69 l 21·39 l 21·87	l 22·49 l 23·53 h 24·07	h 23·26 l 21·63 l 22·24	l 22·82 l 20·53 l 20·42	l 22·66 l 22·03 l 21·76	l 21·28 l 22·44 l 21·40	l 21·66 l 23·97 l 23·46	$M = 22''\cdot 36$ $w = 17\ \cdot 20$ $\frac{1}{w} = 0\ \cdot 06$ $C = 74^\circ\ 13'\ 22''\cdot 36$
	22·92	22·19	22·66	21·98	23·36	22·38	21·26	22·15	21·71	23·03	
LXIV (Ōpilán) and LXVI (Taraigudi)	l 41·81 l 42·06 l 40·65	l 41·64 l 40·93 l 41·59	l 40·29 l 42·84 l 40·78	l 40·89 l 41·86 l 42·28	l 41·33 l 41·76 h 40·61	l 40·73 l 40·64 l 38·83	l 39·32 l 41·40 l 41·80	l 39·45 l 41·27 l 41·59	l 39·71 l 40·34 l 40·66	l 41·04 l 39·79 l 40·50	$M = 40''\cdot 95$ $w = 20\ \cdot 00$ $\frac{1}{w} = 0\ \cdot 05$ $C = 70^\circ\ 34'\ 40''\cdot 95$
	41·51	41·39	41·30	41·68	41·23	40·07	40·84	40·77	40·24	40·44	

At LXIV (Ŏpilán)

February 1875; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXVI (Taraigudi) 0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 50′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVI (Taraigudi) and LXIII (Kadaládi)	″ l 37·11 l 35·85 l 35·88	″ l 37·18 l 36·85 l 37·23	″ l 37·17 l 37·98 l 39·45	″ l 37·41 l 37·37 l 38·44	″ h 37·03 h 36·90 h 37·51	″ l 37·37 l 37·63 l 36·94	″ l 39·27 l 38·19 l 37·48	″ l 37·30 l 36·50 l 37·16	″ l 38·23 l 37·02 l 38·52	″ l 37·98 l 36·71 l 38·87	$M = 37''\cdot48$ $w = 19\cdot20$ $\frac{1}{w} = 0\cdot05$ $C = 68°\ 2'\ 37''\cdot48$
	36·28	37·09	38·20	37·74	37·15	37·31	38·31	36·99	37·92	37·85	
LXIII (Kadaládi) and LXI (Tanichanthai)	l 31·82 l 32·17 l 30·29	l 31·93 l 33·29 l 31·13	l 30·93 l 29·39 l 29·92	l 31·76 l 32·15 l 29·46	h 30·19 h 30·77 h 29·57	l 29·37 l 31·63 l 31·30	l 30·39 l 30·17 l 29·85	l 30·01 l 30·40 l 30·30	l 31·41 l 31·99 l 29·61	l 29·34 l 29·38 l 28·81	$M = 30''\cdot63$ $w = 11\cdot20$ $\frac{1}{w} = 0\cdot09$ $C = 66°\ 58'\ 30''\cdot63$
	31·43	32·12	30·08	31·12	30·18	30·77	30·14	30·24	31·00	29·18	

At LXV (Kidátirukai)

February 1875; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXII (Arapoth) 148° 5′	328° 7′	227° 16′	47° 19′	306° 28′	126° 28′	25° 41′	205° 41′	104° 53′	284° 53′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXII (Arapoth) and LXIII (Kadaládi)	″ l 32·93 l 30·88 l 31·87	″ l 31·32 l 34·92 h 33·63 h 33·20	″ l 33·04 l 32·10 h 31·08	″ h 31·41 l 34·31 l 32·92	″ l 33·23 l 32·64 l 33·68	″ l 34·77 l 34·50 l 33·69	″ l 33·20 l 32·60 l 30·80	″ l 31·03 l 32·84 l 33·81 l 32·20	″ l 31·35 l 33·11 l 32·96	″ l 33·84 l 31·95 l 33·01	$M = 32''\cdot77$ $w = 12\cdot74$ $\frac{1}{w} = 0\cdot08$ $C = 69°\ 51'\ 32''\cdot77$
	31·89	33·27	32·07	32·88	33·18	34·32	32·20	32·47	32·47	32·93	
LXIII (Kadaládi) and LXVII (Pulápati)	l 55·41 l 54·38 l 54·38	l 54·45 l 52·98 l 54·72	l 55·19 h 54·85 h 55·46	h 55·15 l 54·36 h 53·45	l 53·83 l 54·76 l 54·43	l 52·89 l 53·33 l 53·25	l 54·17 l 53·52 l 54·96	l 55·41 l 53·50 l 53·65	l 54·16 l 53·10 l 54·85	l 52·65 l 54·12 l 55·79	$M = 54''\cdot24$ $w = 23\cdot30$ $\frac{1}{w} = 0\cdot04$ $C = 78°\ 11'\ 54''\cdot24$
	54·72	54·05	55·17	54·32	54·34	53·16	54·22	54·19	54·04	54·19	

At LXVI (Taraigudi)

February 1875; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXIX (Súrangudi) 0° 2′	180° 5′	79° 13′	259° 16′	158° 24′	338° 27′	237° 37′	57° 39′	316° 49′	136° 52′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXIX (Súrangudi) and LXVIII (Annapúnáyakanpati)	″ l 38·93 l 37·42 l 36·68	″ l 39·48 l 38·94 l 40·31	″ l 38·75 l 36·59 h 39·88 h 38·83	″ l 39·31 l 38·93 l 38·81	″ l 40·20 l 37·11 l 39·84	″ l 40·45 l 39·52 l 39·52	″ l 39·71 l 38·85 l 38·20	″ l 38·24 l 38·77 l 39·61	″ l 36·90 l 37·89 l 37·60	″ l 39·87 l 38·93 l 39·42	$M = 38''\cdot83$ $w = 12\cdot58$ $\frac{1}{w} = 0\cdot08$ $C = 62°\ 21'\ 38''\cdot83$
	37·68	39·58	38·51	39·02	39·05	39·83	38·92	38·87	37·46	39·41	

At LXVI (Taraigudi)—(*Continued*).

Angle between	Circle readings, telescope being set on LXIX (Súrangudi) 0° 2′	180° 5′	79° 13′	259° 16′	158° 24′	338° 27′	237° 37′	57° 39′	316° 49′	136° 52′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXVIII (Annapúnáyakanpati)	l 35·89	l 36·00	l 34·74	l 35·41	l 33·94	l 33·92	l 34·78	l 36·25	l 36·21	l 34·85	$M = 35''·28$
and	l 35·65	l 36·65	l 35·62	l 35·95	l 34·63	l 35·37	l 34·19	l 36·02	l 33·74	l 37·43	$w = 18·90$
LXVII (Pulápati)	l 35·59	l 35·93	h 34·11	l 34·66	l 33·99	l 35·08	l 35·55	l 35·12	l 35·58	l 35·38	$\frac{1}{w} = 0·05$
	35·71	36·19	34·82	35·34	34·19	34·79	34·84	35·80	35·18	35·89	$C = 56° 58' 35''·28$
LXVII (Pulápati)	l 61·51	l 61·18	l 60·00	l 61·21	l 61·30	l 60·38	l 61·40	l 58·95	l 62·21	l 59·93	$M = 60''·48$
and	l 59·65	l 61·35	l 60·22	l 60·14	l 60·52	l 61·28	l 61·15	l 60·28	l 62·67	l 58·05	$w = 12·30$
LXIII (Kadaládi)	l 60·39	l 60·07	h 58·33	l 61·69	l 59·37	l 60·76	l 60·92	l 59·34	l 60·20	l 59·87	$\frac{1}{w} = 0·08$
	60·52	60·87	59·52	61·01	60·40	60·81	61·16	59·52	61·69	59·28	$C = 67° 6' 0''·48$
LXIII (Kadaládi)	l 40·25	l 39·09	l 41·56	l 41·55	l 41·00	l 40·30	l 38·77	l 40·58	l 40·80	l 39·45	$M = 40''·41$
and	l 39·78	l 37·66	l 39·36	l 39·68	l 42·16	l 39·05	l 41·76	l 39·07	l 42·00	l 41·19	$w = 11·40$
LXIV (Ŏpilán)	l 41·25	l 39·87	h 40·03	l 39·95	l 42·38	l 39·80	l 40·37	l 41·44	h 41·34	h 40·73	$\frac{1}{w} = 0·09$
	40·43	38·87	40·32	40·39	41·85	39·72	40·30	40·36	41·38	40·46	$C = 41° 22' 40''·41$

At LXVII (Pulápati)

***February* 1875; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on LXV (Kidátirukai) 245° 43′	65° 45′	324° 54′	144° 56′	44° 6′	224° 8′	123° 17′	303° 20′	202° 30′	22° 33′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXV (Kidátirukai)	l 48·43	l 49·23	h 49·73	l 47·65	l 48·91	h 48·14	l 49·43	l 47·30	h 48·62	l 51·99	$M = 49''·23$
and	l 49·64	l 47·48	h 50·06	l 48·09	l 50·09	h 46·99	l 50·85	l 49·09	h 50·16	l 49·86	$w = 7·68$
LXIII (Kadaládi)	l 49·71	l 48·06	l 50·77	l 51·12	l 50·32	h 47·13	l 49·02	l 46·95	h 50·29	l 50·12	$\frac{1}{w} = 0·13$
				l 50·26				l 48·49			
	49·26	48·26	50·19	49·28	49·77	47·42	49·77	47·96	49·69	50·66	$C = 44° 12' 49''·22$
LXIII (Kadaládi)	l 25·13	l 23·03	h 24·45	l 24·02	l 24·80	h 23·32	l 24·23	l 25·41	h 23·34	l 21·71	$M = 23''·49$
and	l 22·68	l 23·12	h 22·66	l 23·27	l 22·58	h 24·65	l 22·89	l 24·89	h 24·17	l 23·12	$w = 18·64$
LXVI (Taraigudi)	l 23·40	l 24·48	l 23·84	l 22·25	l 23·73	h 23·64	l 21·53	l 24·20	h 23·31	l 23·34	$\frac{1}{w} = 0·05$
				l 21·26				l 23·34			
	23·74	23·54	23·65	22·70	23·70	23·87	22·88	24·46	23·61	22·72	$C = 73° 27' 23''·49$

At LXVII (Pulápati)—(*Continued*).

Angle between	Circle readings, telescope being set on LXV (Kidátirukai) 245° 43′	65° 45′	324° 54′	144° 56′	44° 6′	224° 8′	123° 17′	303° 20′	202° 30′	22° 33′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXVI (Taraigudi) and LXVIII (Annapúnáyakanpati)	l 6·13 l 6·38 l 4·89	l 4·69 l 3·30 l 4·20	h 5·47 h 3·46 l 4·93	l 5·41 l 4·97 l 5·27	l 4·69 l 5·75 l 4·27	h 5·77 h 3·74 h 3·38 l 5·38	l 4·81 l 4·47 l 4·90	l 4·29 l 4·09 l 4·15	h 3·51 h 3·37 l 5·20	l 4·67 l 4·91 l 4·88	$M = 4''·69$ $w = 22·93$ $\frac{1}{w} = 0·04$ $C = 73° 19' 4''·69$
	5·80	4·06	4·62	5·22	4·90	4·57	4·73	4·18	4·03	4·82	
LXVIII (Annapúnáyakanpati) and LXX (Mutúruni)	l 36·13 l 36·27 l 38·50	l 37·88 l 37·49 l 35·87	h 37·57 h 36·11 l 36·71	l 35·69 l 36·95 l 36·27	l 36·44 l 37·90 l 37·34	h 37·20 h 38·37 h 35·20 l 38·36	l 34·35 l 35·79 l 37·54	l 38·25 l 37·51 l 37·01	h 36·31 h 36·76 h 36·15	l 36·62 l 36·38 l 36·80	$M = 36''·82$ $w = 19·86$ $\frac{1}{w} = 0·05$ $C = 54° 41' 36''·83$
	36·97	37·08	36·80	36·30	37·23	37·28	35·89	37·59	36·41	36·60	

At LXVIII (Annapúnáyakanpati)

January 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXII (Melakalúruni) 0° 2′	180° 2′	79° 12′	259° 13′	158° 25′	338° 25′	237° 36′	57° 37′	316° 50′	136° 51′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXII (Melakalúruni) and LXX (Mutúruni)	h 25·81 h 24·39 l 25·73	l 24·73 l 26·06 l 27·63	l 28·07 l 24·78 l 24·79 l 24·94	l 28·04 h 26·72 h 25·09 h 28·55	h 26·30 h 25·98 h 24·27	l 25·54 l 23·72 l 25·14 l 24·03 l 25·06	l 27·05 h 26·38 l 26·03	l 26·83 l 23·77 l 23·43 l 25·14	l 24·62 h 23·43 h 25·09 h 27·36	l 26·97 l 24·51 l 26·15 l 27·23	$M = 25''·71$ $w = 10·55$ $\frac{1}{w} = 0·09$ $C = 59° 23' 25''·70$
	25·31	26·14	25·65	27·10	25·52	24·70	26·49	24·79	25·13	26·22	
LXX (Mutúruni) and LXVII (Pulápati)	h 14·99 h 17·05 h 16·43	l 17·03 l 15·81 l 16·13	l 15·36 l 16·38 l 17·16	l 14·86 h 15·96 h 13·75 h 14·45	l 17·99 l 17·47 h 14·79 h 16·18	l 16·96 l 15·39 l 16·16	l 17·83 h 14·20 l 14·75	l 14·03 l 16·28 l 16·02 l 16·40	l 16·37 h 18·10 h 16·77	h 14·27 l 16·32 l 15·81 l 16·07	$M = 16''·03$ $w = 14·70$ $\frac{1}{w} = 0·07$ $C = 74° 52' 16''·01$
	16·16	16·32	16·30	14·76	16·61	16·17	15·59	15·68	17·08	15·62	
LXVII (Pulápati) and LXVI (Taraigudi)	h 19·29 h 18·10 l 21·44	l 18·14 l 18·51 l 18·74	l 17·63 l 18·38 l 18·77	l 21·46 h 21·94 h 22·19 l 22·14 l 18·18 l 18·57	h 19·47 l 16·65 l 19·17 l 17·44 h 18·08	l 19·94 l 21·44 l 22·27 h 18·38	l 20·91 h 19·13 l 20·20	l 20·20 l 17·82 l 20·27 l 19·52	l 19·08 h 19·76 h 20·43	h 19·62 h 17·08 l 20·41	$M = 19''·41$ $w = 8·06$ $\frac{1}{w} = 0·12$ $C = 49° 42' 19''·43$
	19·61	18·46	18·26	20·75	18·16	20·51	20·08	19·45	19·76	19·04	

At LXVIII (Annapúnáyakanpati)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXII (Melakalúruni) 0° 2′	180° 2′	79° 12′	259° 13′	158° 25′	338° 25′	237° 36′	57° 37′	316° 50′	136° 51′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVI (Taraigudi) and LXIX (Súrangudi)	″ h 49·56 h 49·05 l 49·15	″ l 50·08 l 49·86 l 48·13	″ l 50·16 l 50·09 l 50·55	″ h 50·52 h 49·21 l 48·99	″ h 50·77 l 50·47 l 48·15 h 50·52	″ l 47·92 l 48·84 l 47·24 h 49·23	″ l 46·44 h 49·41 h 48·92 h 50·39	″ l 48·31 l 51·75 l 49·87 l 47·17	″ l 50·81 h 49·82 h 50·18	″ h 50·75 h 51·88 l 49·07 l 48·77	$M = 49''\cdot52$ $w = 13\cdot30$ $\frac{1}{w} = 0\cdot08$ $C = 50° \; 3' 49''\cdot51$
	49·25	49·36	50·27	49·57	49·98	48·31	48·79	49·28	50·27	50·12	
LXIX (Súrangudi) and LXXI (Mŏtúruni)	h 41·74 h 40·71 l 44·74	l 41·23 l 41·93 l 44·33	l 41·35 l 39·95 l 39·55 l 43·11 l 41·73	h 42·51 h 42·08 h 42·44	h 41·00 l 42·98 l 43·27 h 43·84	l 44·00 l 43·90 h 42·06	l 43·24 h 42·26 l 44·14	l 43·62 l 42·71 l 43·45 l 43·70	l 42·54 h 43·00 h 42·10	h 44·23 h 44·95 l 39·62 l 42·40	$M = 42''\cdot64$ $w = 11\cdot91$ $\frac{1}{w} = 0\cdot08$ $C = 85° \; 26' 42''\cdot62$
	42·40	42·50	41·14	42·34	42·77	43·32	43·21	43·37	42·55	42·80	
LXXI (Mŏtúruni) and LXXII (Melakalúruni)	h 29·39 l 28·78 l 27·18 l 27·44	l 26·74 l 28·15 l 27·00	l 28·46 l 28·65 l 26·34	l 26·73 h 25·89 h 23·99 l 24·19	h 27·02 l 27·76 h 25·92	l 28·14 l 28·18 l 26·95 l 27·91	l 24·92 h 29·01 l 25·23 l 27·04 l 26·00	l 27·09 l 28·41 l 27·30 l 27·23	l 27·64 h 27·50 h 25·27 h 27·08	h 24·32 h 24·75 l 27·05 l 28·97 l 29·00	$M = 27''\cdot09$ $w = 9\cdot15$ $\frac{1}{w} = 0\cdot11$ $C = 40° \; 31' 27''\cdot08$
	28·20	27·30	27·82	25·20	26·90	27·80	26·44	27·51	26·87	26·82	

At LXIX (Súrangudi)

January 1875; *observed by Mr. G. Belcham with Troughton and Simms*' 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXI (Mŏtúruni) 0° 2′	180° 5′	79° 13′	259° 16′	158° 25′	338° 28′	237° 38′	57° 41′	316° 49′	136° 52′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXXI (Mŏtúruni) and LXVIII (Annapúnáyakanpati)	″ h 19·74 l 22·22 l 21·08 l 21·35	″ l 20·79 l 20·54 l 22·95 l 22·36	″ l 22·00 l 23·25 l 21·84	″ l 21·17 h 21·27 h 22·52	″ h 20·15 l 22·20 l 20·45	″ l 19·43 l 21·50 l 23·38 l 20·94	″ l 21·73 l 20·64 l 21·69	″ l 19·45 l 20·41 l 20·05	″ l 21·09 l 20·05 l 19·86	″ l 23·24 l 20·01 l 21·47 l 21·43	$M = 21''\cdot22$ $w = 13\cdot86$ $\frac{1}{w} = 0\cdot07$ $C = 52° \; 20' 21''\cdot23$
	21·10	21·66	22·36	21·65	20·93	21·31	21·35	19·97	20·33	21·54	
LXVIII (Annapúnáyakanpati) and LXVI (Taraigudi)	h 34·99 h 33·60 l 34·11	l 32·62 l 32·83 l 30·60 l 31·25	l 33·90 l 30·55 l 31·42 l 33·04	l 31·60 l 32·08 h 33·23 h 31·91	h 32·49 h 31·89 l 30·96 l 32·70	l 32·20 l 33·54 l 31·37 l 31·74	l 34·93 l 32·40 l 32·37 l 30·07	l 32·50 l 30·64 l 30·67	l 31·32 l 30·53 l 30·81	l 31·09 l 32·43 l 31·68	$M = 32''\cdot11$ $w = 9\cdot56$ $\frac{1}{w} = 0\cdot10$ $C = 67° \; 34' 32''\cdot11$
	34·23	31·83	32·23	32·21	32·01	32·21	32·44	31·27	30·89	31·73	

At LXX (Mutúruni)

January 1875; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXVII (Pulápati) 124° 32′	304° 32′	203° 42′	23° 42′	282° 55′	102° 55′	2° 7′	182° 7′	81° 19′	261° 19′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXVII (Pulápati) and LXVIII (Annapúnáyakanpati)	″ h 5·19 h 9·00 h 8·10 l 8·85	″ h 10·43 h 10·06 h 8·82 h 8·30 l 7·21	″ l 8·07 l 6·37 l 7·53 l 8·10	″ l 7·21 l 7·35 l 8·81 l 5·75	″ l 5·72 l 7·89 l 8·52	″ l 7·37 l 6·62 l 7·60	″ h 9·00 l 8·66 l 8·39	″ h 11·49 h 10·38 l 9·14 l 9·04 l 6·32 h 9·00	″ l 9·27 l 9·91 l 6·46 l 9·01	″ l 9·50 l 7·76 l 8·74	$M = 8''\cdot14$ $w = 10\cdot39$ $\frac{1}{w} = 0\cdot10$ $C = 50^\circ\ 26'\ 8''\cdot17$
	7·79	8·96	7·52	7·28	7·38	7·20	8·68	9·23	8·66	8·67	
LXVIII (Annapúnáyakanpati) and LXXII (Melakalúruni)	h 42·57 h 41·09 h 39·82 l 42·10	h 40·17 h 39·24 h 42·94 l 38·44	l 40·21 l 42·92 l 39·82 l 39·51	l 42·61 l 41·07 l 38·05 l 43·00	l 39·99 l 39·92 l 41·62	l 40·91 l 41·61 l 41·26	h 40·77 l 40·29 l 40·67	h 41·62 h 40·64 l 39·53 l 40·78 l 42·28	l 40·06 l 38·87 l 40·88 h 41·11	l 41·37 l 41·69 l 40·74	$M = 40''\cdot82$ $w = 17\cdot54$ $\frac{1}{w} = 0\cdot06$ $C = 74^\circ\ 3'\ 40''\cdot82$
	41·40	40·20	40·62	41·18	40·51	41·26	40·58	40·97	40·23	41·27	

At LXXI (Mŏtúruni)

January 1875; *observed by Major B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXIII (Supalápuram) 0° 2′	180° 0′	79° 13′	259° 11′	158° 24′	338° 21′	237° 36′	57° 34′	316° 50′	136° 47′	M = Mean of Groups w = Relative Weight C = Concluded Angle
LXXIII (Supalápuram) and LXXIV (Mínákshi)	″ h 16·31 h 15·85 h 14·31	″ h 18·44 l 17·10 l 17·96	″ l 17·12 l 15·72 l 16·95	″ h 17·03 h 17·14 h 17·44	″ h 16·17 h 15·44 h 15·18	″ h 18·58 h 17·83 h 17·29	″ l 17·09 l 16·42 l 17·09	″ l 16·81 l 17·12 l 16·93	″ h 17·71 h 16·85 l 16·53	″ h 18·42 h 18·72 h 17·44	$M = 16''\cdot97$ $w = 11\cdot00$ $\frac{1}{w} = 0\cdot09$ $C = 53^\circ\ 20'\ 16''\cdot97$
	15·49	17·83	16·60	17·20	15·60	17·90	16·87	16·95	17·03	18·19	
LXXIV (Mínákshi) and LXXII (Melakalúruni)	h 20·85 h 21·89 h 21·84	h 22·24 l 22·20 l 21·78	l 22·35 l 21·98 l 20·78	h 22·54 h 22·62 h 22·05	h 22·08 h 22·71 h 22·30	h 21·80 h 21·69 h 21·59	l 22·96 l 22·24 l 22·11	l 21·58 l 20·88 l 22·17	h 21·57 h 21·97 h 21·07 l 22·07	h 20·40 h 20·36 l 22·26	$M = 21''\cdot84$ $w = 33\cdot54$ $\frac{1}{w} = 0\cdot03$ $C = 66^\circ\ 43'\ 21''\cdot84$
	21·53	22·07	21·70	22·40	22·36	21·69	22·44	21·54	21·67	21·01	
LXXII (Melakalúruni) and LXVIII (Annapúnáyakanpati)	h 39·61 h 39·96 h 39·03	h 37·66 l 39·94 l 39·21	l 40·17 l 40·64 l 41·00	h 37·85 h 39·82 h 37·56	h 38·08 h 38·49 h 39·79	h 39·12 h 38·42 h 39·47	l 40·51 l 38·80 l 40·31	l 39·05 l 40·26 l 40·41	h 38·54 h 39·79 h 38·58 l 39·60	h 38·40 h 37·90 l 40·49	$M = 39''\cdot31$ $w = 16\cdot51$ $\frac{1}{w} = 0\cdot06$ $C = 76^\circ\ 10'\ 39''\cdot31$
	39·53	38·94	40·60	38·41	38·79	39·00	39·87	39·91	39·13	38·93	

At LXXI (Mŏtúruni)—(*Continued*).

Angle between	0° 2′	180° 0′	79° 13′	259° 11′	158° 24′	338° 21′	237° 36′	57° 34′	316° 50′	136° 47′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on LXXIII (Supalápuram)										
	″	″	″	″	″	″	″	″	″	″	
LXVIII (Annapúnáyakanpati) and LXIX (Súrangudi)	h 57·89 h 56·38 h 56·54	h 56·96 l 55·18 l 55·71	l 55·56 l 56·35 l 55·47	h 56·55 h 55·53 h 56·97	h 57·48 h 57·56 h 55·83	h 55·97 h 57·06 h 55·71	l 54·69 l 56·06 l 54·91	l 55·88 l 54·65 l 54·75	h 57·37 h 54·87 l 56·62	h 55·30 h 56·18 l 54·78	$M = 56''·03$ $w = 16·90$ $\frac{1}{w} = 0·06$ $C = 42° 12' 56''·03$
	56·94	55·95	55·79	56·35	56·96	56·25	55·22	55·09	56·29	55·42	

At LXXII (Melakalúruni)

January 1875; *observed by Major B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	199° 24′	19° 22′	278° 36′	98° 34′	357° 46′	177° 44′	76° 59′	256° 57′	156° 12′	336° 10′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on LXX (Mutúruni)										
	″	″	″	″	″	″	″	″	″	″	
LXX (Mutúruni) and LXVIII (Annapúnáyakanpati)	h 52·16 h 52·22 h 52·59	h 53·48 h 52·95 h 53·14	l 52·87 l 53·42 l 54·94	l 53·29 l 55·08 l 54·38	h 52·22 h 54·16 h 54·56	h 52·82 h 51·60 h 53·41 l 53·39	l 52·32 l 52·55 l 51·45	l 52·91 l 52·71 l 54·83	h 51·67 h 54·88 h 52·32 h 52·90	h 52·43 h 54·16 h 53·35	$M = 53''·18$ $w = 15·70$ $\frac{1}{w} = 0·06$ $C = 46° 32' 53''·17$
	52·32	53·19	53·74	54·25	53·65	52·81	52·11	53·48	52·94	53·31	
LXVIII (Annapúnáyakanpati) and LXXI (Mŏtúruni)	h 56·26 h 55·77 h 55·06	h 54·91 h 54·85 h 55·38	l 54·82 l 53·71 l 52·46 l 52·37 l 54·44	l 54·75 l 54·94 l 56·05	h 52·70 h 53·92 h 54·64	h 56·52 h 55·41 h 54·79 l 52·58	l 53·46 l 52·51 l 53·82	l 54·17 l 53·83 l 52·66	h 54·00 h 51·41 h 55·72 h 56·18	h 56·60 h 54·72 h 54·80	$M = 54''·47$ $w = 8·97$ $\frac{1}{w} = 0·11$ $C = 63° 17' 54''·46$
	55·70	55·05	53·56	55·25	53·75	54·83	53·26	53·55	54·33	55·37	
LXXI (Mŏtúruni) and LXXIII (Supalápuram)	h 9·47 h 8·83 h 8·77	h 9·69 h 8·70 h 8·68	l 7·27 l 9·95 l 9·59 l 9·40	l 7·55 l 8·76 l 7·92	h 8·71 h 7·43 h 8·82	h 7·59 h 8·97 h 7·87	l 10·40 l 9·43 l 10·19	l 7·92 l 9·35 l 8·91	h 8·76 h 8·78 h 8·23 h 7·10	h 7·92 h 9·12 h 7·55	$M = 8''·68$ $w = 19·84$ $\frac{1}{w} = 0·05$ $C = 36° 53' 8''·68$
	9·02	9·02	9·05	8·08	8·32	8·14	10·01	8·73	8·22	8·20	
LXXIII (Supalápuram) and LXXIV (Mínákshi)	h 17·15 h 16·73 h 16·18	h 17·41 h 18·14 h 17·61	l 18·36 l 17·25 l 17·15	l 19·27 l 16·38 l 17·27	h 17·44 h 18·22 h 16·28	h 17·68 h 17·36 h 17·00	l 15·89 l 17·31 l 16·62	l 19·04 l 17·80 l 17·54	h 17·21 h 19·18 h 16·81	h 19·29 h 17·42 h 19·06	$M = 17''·54$ $w = 18·50$ $\frac{1}{w} = 0·05$ $C = 52° 38' 17''·54$
	16·69	17·72	17·59	17·64	17·31	17·35	16·61	18·13	17·73	18·59	

At LXXIII (Supalápuram)

January 1875; *observed by Major B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXV (Kulayanallúr) 0°2′	180°1′	79°13′	259°12′	158°24′	338°23′	237°36′	57°34′	316°50′	136°49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXV (Kulayanallúr) and LXXXIII (Koilpati)	l 25·45	l 27·38	h 23·15	l 22·90	h 26·30	h 24·61	h 25·83	h 25·28	l 25·60	l 24·60	$M = 24''·84$
	l 26·67	l 26·21	l 25·89	l 23·69	h 24·50	h 23·28	h 25·06	h 24·19	l 25·52	l 24·96	$w = 11·96$
	h 25·93	l 25·13	h 24·73	l 23·19	h 24·35	h 23·72	h 24·55	h 24·64	l 24·58	l 25·01	$\frac{1}{w} = 0·08$
		h 24·14									
	26·02	25·72	24·59	23·26	25·05	23·87	25·15	24·70	25·23	24·86	$C = 77° 59' 24''·84$
LXXXIII (Koilpati) and LXXIV (Mínákshi)	l 26·36	l 26·58	h 27·37	l 27·82	h 25·68	h 27·20	h 26·52	h 25·56	l 28·52	l 27·61	$M = 26''·89$
	l 25·05	l 26·79	l 27·14	l 28·84	h 25·85	h 26·87	h 25·99	h 26·45	l 27·44	l 28·20	$w = 8·70$
	h 24·84	l 27·13	h 25·35	l 29·10	h 26·77	h 29·23	h 26·26	h 26·06	l 27·98	l 26·24	$\frac{1}{w} = 0·11$
	25·42	26·83	26·62	28·59	26·10	27·77	26·26	26·02	27·98	27·35	$C = 31° 33' 26''·89$
LXXIV (Mínákshi) and LXXII (Melakalúruni)	l 40·51	l 40·54	l 40·81	l 40·99	h 40·32	h 39·71	h 39·34	h 40·26	l 39·20	l 40·42	$M = 40''·11$
	l 40·64	l 40·38	h 40·81	l 39·87	h 40·66	h 40·76	h 40·04	h 40·37	l 39·46	l 38·42	$w = 24·40$
	h 39·88	l 40·41	l 41·00	l 41·44	h 39·09	h 39·07	h 39·73	h 40·11	h 38·25	l 40·81	$\frac{1}{w} = 0·04$
	40·34	40·44	40·87	40·77	40·02	39·85	39·70	40·25	38·97	39·88	$C = 65° 29' 40''·11$
LXXII (Melakalúruni) and LXXI (Mŏtúruni)	l 13·29	l 11·74	l 14·36	l 12·05	h 12·43	h 13·25	h 13·30	h 12·29	l 10·82	l 12·04	$M = 12''·57$
	l 13·51	l 12·80	h 13·59	l 13·53	h 11·63	h 12·08	h 10·70	h 12·24	l 11·50	l 13·80	$w = 16·90$
	l 11·45	l 12·25	l 13·61	l 12·22	h 12·09	h 13·68	h 12·46	h 12·52	h 12·25	l 13·73	$\frac{1}{w} = 0·06$
	12·75	12·26	13·85	12·60	12·05	13·00	12·15	12·35	11·52	13·19	$C = 23° 3' 12''·57$

At LXXIV (Mínákshi)

January 1875; *observed by Major B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXII (Melakalúruni) 166°46′	346°45′	245°56′	65°56′	325°7′	145°7′	44°19′	224°18′	123°38′	303°32′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXII (Melakalúruni) and LXXI (Mŏtúruni)	l 12·18	l 11·58	l 12·54	l 11·07	l 12·25	l 12·44	l 12·49	h 10·83	l 11·99	l 11·37	$M = 12''·02$
	l 12·16	l 10·92	l 12·01	l 11·06	l 12·00	l 12·53	l 11·79	l 13·77	l 10·31	l 11·97	$w = 22·70$
	l 11·74	l 11·17	l 13·92	l 11·81	l 13·01	l 11·30	l 12·01	l 13·36	l 12·16	l 12·77	$\frac{1}{w} = 0·04$
	12·03	11·22	12·82	11·31	12·42	12·09	12·10	12·65	11·49	12·04	$C = 23° 45' 12''·02$

NOTE.—Stations LXXXIII (Koilpati) and LXXXV (Kulayanallúr) appertain to the Great Arc Meridional Series, Section 8° to 18°.

At LXXIV (Mínákshi)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXII (Melakalúruni) 166° 46′	346° 45′	245° 56′	65° 56′	325° 7′	145° 7′	44° 19′	224° 18′	123° 33′	303° 32′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXI (Mötúruni) and LXXIII (Supalápuram)	l 51·63	l 51·44	l 51·04	l 52·22	l 50·64	l 51·37	l 51·61	h 52·88	l 51·17	l 51·17	M = 51″·32
	l 51·45	l 52·34	l 50·41	l 51·70	l 51·36	l 51·64	l 51·22	l 51·46	l 52·43	l 51·02	w = 33·30
	l 51·26	l 52·16	l 49·80	l 51·25	l 51·05	l 51·44	l 51·53	l 50·21	l 50·52	l 50·27	1/w = 0·03
	51·45	51·98	50·42	51·72	51·02	51·48	51·45	51·52	51·37	50·82	C = 38° 6′ 51″·32
LXXIII (Supalápuram) and LXXXV (Kulayanallúr)	l 11·92	l 11·58	l 12·59	l 11·00	l 12·48	l 10·48	l 11·06	h 11·23	l 11·54	l 11·29	M = 11″·39
	l 12·18	l 11·32	l 12·37	l 10·91	l 11·63	l 10·67	l 10·57	l 10·42	l 9·35	l 11·45	w = 25·74
	l 11·98	l 12·63	l 11·52	l 11·25	l 11·96	l 11·86	l 10·82	l 11·15	l 11·82	l 10·49	1/w = 0·04
									l 11·14		
	12·03	11·84	12·16	11·05	12·02	11·00	10·82	10·93	10·96	11·08	C = 35° 59′ 11″·39
LXXXV (Kulayanallúr) and LXXXIII (Koilpati)	l 60·01	l 59·84	l 59·83	l 59·54	l 59·78	l 61·08	l 59·65	h 59·23	l 60·82	l 61·11	M = 60″·35
	l 60·97	l 58·89	l 59·63	l 60·67	l 60·16	l 61·29	l 61·55	l 61·31	l 61·74	l 61·14	w = 18·50
	l 59·18	l 58·81	l 60·04	l 60·83	l 59·48	l 59·76	l 60·29	l 62·12	l 60·57	l 61·22	1/w = 0·05
	60·05	59·18	59·83	60·35	59·81	60·71	60·50	60·89	61·04	61·16	C = 68° 52′ 0″·35

At LXXXIII (Koilpati)

January 1875; *observed by Major B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXIV (Mínákshi) 84° 12′	264° 12′	163° 24′	343° 23′	242° 34′	62° 33′	321° 46′	141° 46′	41° 0′	221° 0′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXIV (Mínákshi) and LXXIII (Supalápuram)	h 22·76	h 22·83	l 22·36	l 22·81	l 23·29	l 22·50	h 22·86	h 20·62	l 22·23	l 21·82	M = 22″·42
	h 22·00	h 23·07	l 22·41	l 22·51	l 21·51	l 22·38	h 24·24	h 22·56	l 23·08	l 22·22	w = 24·40
	h 21·31	h 23·13	l 23·39	l 22·50	l 21·63	l 21·97	h 23·26	h 22·17	l 22·08	l 21·00	1/w = 0·04
	22·02	23·01	22·72	22·61	22·14	22·28	23·45	21·78	22·46	21·68	C = 43° 35′ 22″·42
LXXIII (Supalápuram) and LXXXV (Kulayanallúr)	h 38·12	h 38·77	l 38·73	l 41·52	l 39·02	l 37·56	h 39·22	h 40·32	l 39·23	l 40·67	M = 39″·43
	h 40·26	h 39·30	l 39·83	l 38·91	l 39·41	l 37·78	h 38·54	h 39·16	l 38·92	l 40·33	w = 16·40
	h 40·53	h 38·89	l 38·86	l 39·83	l 40·62	l 38·90	h 39·22	l 39·79	l 39·76	l 40·84	1/w = 0·06
	39·64	38·99	39·14	40·09	39·68	38·08	38·99	39·76	39·30	40·61	C = 40° 34′ 39″·43

Note.—Stations LXXXIII (Koilpati) and LXXXV (Kulayanallúr) appertain to the Great Arc Meridional Series, Section 8° to 18°.

At LXXXV (Kulayanallúr)

December 1874; *observed by Major B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXIII (Koilpati) 0° 2′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 36′	57° 36′	316° 50′	136° 50′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXIII (Koilpati) and LXXIV (Mínákshi)	*l* 58·26 *l* 58·77 *l* 58·16	*l* 58·75 *l* 58·90 *l* 59·49	*l* 59·58 *l* 59·53 *l* 58·53	*l* 60·36 *l* 59·97 *l* 59·36	*h* 58·85 *h* 58·86 *h* 59·09	*h* 59·10 *h* 58·59 *h* 57·72	*l* 60·59 *l* 59·15 *l* 59·42	*l* 59·38 *l* 59·44 *l* 58·19	*l* 58·95 *l* 60·20 *l* 57·83	*l* 58·84 *l* 57·79 *l* 58·54	$M = 59''{\cdot}01$ $w = 27{\cdot}80$ $\frac{1}{w} = 0{\cdot}04$ $C = 26^\circ\,57'\,59''{\cdot}01$
	58·40	59·05	59·21	59·90	58·93	58·47	59·72	59·00	58·99	58·39	
LXXIV (Mínákshi) and LXXIII (Supalápuram)	*l* 56·67 *l* 58·31 *l* 56·73	*l* 57·00 *l* 57·57 *l* 58·05	*l* 58·12 *l* 57·34 *l* 58·54	*l* 56·81 *l* 56·36 *l* 56·85	*h* 57·58 *h* 57·12 *h* 57·52	*h* 57·91 *h* 58·97 *h* 57·95	*l* 55·96 *l* 57·40 *l* 56·79	*l* 57·12 *l* 57·43 *l* 58·23 *h* 56·91	*l* 57·32 *l* 56·72 *l* 58·50	*l* 57·57 *l* 57·80 *l* 58·93	$M = 57''{\cdot}49$ $w = 25{\cdot}82$ $\frac{1}{w} = 0{\cdot}04$ $C = 34^\circ\,27'\,57''{\cdot}49$
	57·24	57·54	58·00	56·67	57·41	58·28	56·72	57·42	57·51	58·10	

NOTE.—Stations LXXXIII (Koilpati) and LXXXV (Kulayanallúr) appertain to the Great Arc Meridional Series, Section 8° to 18°.

June 1882.

J. B. N. HENNESSEY,
In charge of Computing Office.

CEYLON BRANCH SERIES OF THE SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. OBSERVED ANGLES.

At LIX (Kánjarangudi)

March 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXVII (Pĕriyapatnam)										M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	277° 30′	97° 30′	356° 41′	176° 41′	75° 53′	255° 53′	155° 5′	335° 5′	234° 18′	54° 18′	
	″	″	″	″	″	″	″	″	″	″	
LXXVII (Pĕriyapatnam) and LXXVIII (Válai Tívu)	*l* 61·39	*l* 62·45	*l* 60·99	*h* 59·61	*l* 61·77	*l* 63·24	*l* 60·96	*l* 62·04	*l* 61·83	*l* 62·58	$M = 61''·59$
	l 60·84	*l* 61·64	*l* 60·70	*h* 59·76	*l* 61·07	*l* 62·38	*l* 60·42	*l* 62·47	*l* 63·67	*l* 62·49	$w = 11·20$
	l 60·37	*l* 62·17	*l* 60·33	*h* 61·79	*l* 61·47	*l* 63·00	*l* 60·51	*h* 62·04	*l* 62·05	*l* 61·78	$\frac{1}{w} = 0·09$
	60·87	62·09	60·67	60·39	61·44	62·87	60·63	62·18	62·52	62·28	$C = 27° 28′ 1''·59$
LXXVIII (Válai Tívu) and LXXVI (Appa Tívu)	*l* 17·87	*l* 18·66	*l* 18·84	*h* 18·34	*l* 18·17	*l* 16·41	*l* 17·04	*l* 17·02	*l* 16·21	*l* 15·11	$M = 18''·00$
	l 18·06	*l* 19·45	*l* 18·20	*h* 19·61	*l* 18·80	*l* 18·44	*l* 18·17	*h* 18·26	*l* 17·31	*l* 17·13	$w = 11·90$
	l 17·91	*l* 18·46	*l* 18·81	*h* 19·36	*l* 19·10	*l* 18·34	*l* 17·95	*h* 16·92	*l* 19·21	*l* 16·93	$\frac{1}{w} = 0·08$
	17·95	18·86	18·62	19·10	18·69	17·73	17·72	17·40	17·58	16·39	$C = 53° 28′ 18''·00$

At LIX (Kánjarangudi)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXVII (Pĕriyapatnam) 277° 30′	97° 30′	356° 41′	176° 41′	75° 53′	255° 53′	155° 5′	335° 5′	234° 18′	54° 18′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXVI (Appa Tívu)	l 19·22	l 20·19	l 18·49	h 20·07	l 18·35	l 21·30	l 19·56	l 20·38	l 18·11	l 20·80	$M = 19''\cdot83$
and	l 19·45	l 19·89	l 19·48	h 21·45	l 19·18	l 21·71	l 21·30	h 20·45	l 17·75	l 20·66	$w = 9\cdot80$
LXXV (Púvarasanhalli Tívu)	l 19·55	l 19·00	h 19·86	h 19·70	l 18·42	l 19·77	l 20·12	h 20·05	l 18·76	l 21·92	$\frac{1}{w} = 0\cdot10$
	19·41	19·69	19·28	20·41	18·65	20·93	20·33	20·29	18·21	21·13	$C = 44^\circ\ 28'\ 19''\cdot83$
LXXV (Púvarasanhalli Tívu)	l 61·13	l 59·04	l 60·43	h 61·24	l 62·15	l 61·54	l 60·91	l 60·94	l 61·26	l 61·85	$M = 60''\cdot89$
and	l 59·61	l 60·50	l 59·70	h 61·42	l 61·58	l 60·83	l 59·44	l 60·58	l 62·22	l 61·51	$w = 18\cdot20$
LX (Yervádi)	l 60·35	l 61·35	h 59·00	h 60·95	l 61·23	l 61·09	l 61·28	h 61·07	l 62·18	l 60·24	$\frac{1}{w} = 0\cdot05$
	60·36	60·30	59·71	61·20	61·65	61·15	60·54	60·86	61·89	61·20	$C = 42^\circ\ 29'\ 0''\cdot89$

At LX (Yervádi)

March 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LIX (Kánjarangudi) 191° 16′	11° 16′	270° 27′	90° 27′	349° 38′	169° 39′	68° 51′	248° 51′	148° 3′	328° 3′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LIX (Kánjarangudi)	l 45·59	l 44·19	l 45·78	l 45·61	l 44·91	l 46·41	l 45·29	l 44·90	l 43·22	l 45·36	$M = 44''\cdot99$
and	l 45·66	l 44·09	l 43·49	l 44·62	l 44·95	l 44·35	l 45·60	l 47·23	l 44·18	l 44·79	$w = 21\cdot30$
LXXVI (Appa Tívu)	l 44·08	l 44·16	l 44·21	l 45·41	l 45·14	l 45·87	l 45·09	l 45·09	l 44·74	l 45·63	$\frac{1}{w} = 0\cdot05$
	45·11	44·15	44·49	45·21	45·00	45·54	45·33	45·74	44·05	45·26	$C = 46^\circ\ 46'\ 44''\cdot99$
LXXVI (Appa Tívu)	l 13·74	l 14·01	l 13·46	l 12·70	l 14·09	l 13·86	l 13·97	l 14·34	l 15·32	l 16·13	$M = 14''\cdot14$
and	l 12·77	l 14·66	l 14·24	l 13·31	l 13·69	l 14·72	l 13·77	l 13·00	l 16·13	l 15·19	$w = 14\cdot50$
LXXV (Púvarasanhalli Tívu)	l 14·28	l 13·49	l 13·47	l 13·17	l 14·73	l 14·72	l 13·35	l 14·60	l 15·95	l 13·33	$\frac{1}{w} = 0\cdot07$
	13·60	14·05	13·72	13·06	14·17	14·43	13·70	13·98	15·80	14·88	$C = 40^\circ\ 30'\ 14''\cdot14$

At LXXV (Púvarasanhalli Tívu)

March and April 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LX (Yervádi) 0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LX (Yervádi)	l 60·64	l 59·28	l 60·91	l 61·86	l 58·28	h 58·81	l 59·41	l 60·26	l 62·11	l 59·64	$M = 60''\cdot04$
and	l 60·61	l 59·89	l 60·09	l 60·03	l 59·86	h 61·04	l 59·50	l 59·29	l 59·95	l 58·58	$w = 20\cdot40$
LIX (Kánjarangudi)	l 60·42	l 58·97	l 60·37	l 60·36	l 59·56	l 59·87	l 60·31	l 59·82	l 60·68	l 60·70	$\frac{1}{w} = 0\cdot05$
	60·56	59·38	60·46	60·75	59·23	59·91	59·74	59·79	60·91	59·64	$C = 50^\circ\ 14'\ 0''\cdot04$

At LXXV (Púvarasanhalli Tívu)—(*Continued*).

Circle readings, telescope being set on LX (Yervádi)

Angle between	0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LIX (Kánjarangudi) and LXXVI (Appa Tívu)	*l* 34·67	*l* 36·06	*l* 35·91	*l* 34·22	*l* 35·15	*h* 35·50	*l* 36·32	*l* 34·21	*l* 33·10	*l* 35·73	M = 34″·80
	l 33·68	*l* 34·19	*l* 33·94	*l* 35·06	*l* 34·23	*h* 34·93	*l* 35·78	*l* 35·62	*l* 33·89	*l* 35·80	w = 18 ·90
	l 33·77	*l* 35·94	*l* 34·11	*l* 34·92	*l* 34·20	*l* 34·02	*l* 35·38	*l* 34·84	*l* 33·99	*l* 34·68	$\frac{1}{w}$ = 0 ·05
	34·04	35·40	34·65	34·73	34·53	34·82	35·83	34·89	33·66	35·40	C = 50° 37′ 34″·80

At LXXVI (Appa Tívu)

April 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Circle readings, telescope being set on LXXV (Púvarasanhalli Tívu)

Angle between	0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXV (Púvarasanhalli Tívu) and LX (Yervádi)	*l* 11·06	*l* 11·65	*l* 10·71	*l* 11·05	*h* 10·34	*l* 11·74	*l* 12·08	*l* 10·84	*l* 11·68	*l* 9·33	M = 10″·94
	l 9·69	*l* 10·79	*l* 11·53	*l* 10·77	*l* 9·83	*l* 11·79	*l* 10·99	*l* 10·18	*l* 12·66	*l* 10·00	w = 15 ·60
	l 10·31	*l* 10·51	*l* 10·57	*l* 10·58	*l* 10·87	*l* 13·07	*l* 11·00	*l* 9·94	*l* 11·98	*l* 10·76	$\frac{1}{w}$ = 0 ·06
	10·35	10·98	10·94	10·80	10·35	12·20	11·36	10·32	12·11	10·03	C = 38° 38′ 10″·94

Angle between	0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
LX (Yervádi) and LIX (Kánjarangudi)	*l* 52·38	*l* 52·65	*l* 52·62	*l* 54·71	*h* 55·32	*l* 52·36	*l* 52·65	*l* 52·03	*l* 52·55	*l* 53·79	M = 53″·01
	l 52·34	*l* 52·22	*l* 52·64	*l* 52·51	*l* 54·82	*l* 53·13	*l* 52·50	*l* 52·16	*l* 51·80	*l* 54·56	w = 11 ·80
	l 53·68	*l* 52·00	*l* 54·12	*l* 53·08	*l* 54·86	*l* 52·42	*l* 52·81	*l* 52·82	*l* 51·94	*l* 52·71	$\frac{1}{w}$ = 0 ·08
	52·80	52·29	53·13	53·43	55·00	52·64	52·65	52·34	52·10	53·69	C = 46° 15′ 53″·01

Angle between	0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
LIX (Kánjarangudi) and LXXVII (Pěriyapatnam)	*l* 39·90	*l* 41·24	*l* 39·50	*l* 39·68	*h* 39·95	*l* 40·37	*l* 40·56	*l* 41·70	*l* 40·72	*l* 41·81	M = 40″·39
	l 40·38	*l* 41·48	*l* 38·96	*l* 42·22	*h* 37·95	*l* 41·12	*l* 39·68	*l* 40·75	*l* 40·30	*l* 39·50	w = 10 ·50
	l 40·29	*l* 40·99	*l* 38·34	*l* 41·44	*l* 38·45	*l* 39·96	*l* 40·43	*l* 41·42	*l* 40·76	*l* 41·81	$\frac{1}{w}$ = 0 ·10
	40·19	41·24	38·93	41·11	38·78	40·48	40·22	41·29	40·59	41·04	C = 54° 29′ 40″·39

Angle between	0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
LXXVII (Pěriyapatnam) and LXXVIII (Válai Tívu)	*l* 9·94	*l* 10·87	*l* 12·37	*l* 13·02	*h* 10·22	*l* 9·52	*l* 11·55	*l* 10·73	*l* 10·61	*l* 11·38	M = 11″·34
	l 11·48	*l* 11·71	*l* 11·52	*l* 10·96	*h* 12·76	*l* 10·15	*l* 12·06	*l* 10·69	*l* 11·84	*l* 10·42	w = 13 ·00
	l 11·41	*l* 12·01	*l* 13·72	*l* 11·60	*l* 10·41	*l* 11·22	*l* 13·16	*l* 10·17	*l* 12·09	*l* 10·61	$\frac{1}{w}$ = 0 ·08
	10·94	11·53	12·54	11·86	11·13	10·30	12·26	10·53	11·51	10·80	C = 36° 33′ 11″·34

At LXXVII (Pĕriyapatnam)

April 1875; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXIX (Rámaswámi Madam)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	183° 21′	3° 21′	262° 32′	82° 33′	341° 44′	161° 44′	60° 57′	240° 57′	140° 9′	320° 9′	
LXXIX (Rámaswámi Madam) and LXXX (Musal Tívu)	″ h 26·02 l 27·94 l 26·47	″ h 27·25 h 25·14 l 25·32	″ l 26·04 l 27·18 l 26·38	″ l 26·89 l 28·28 l 27·64	″ l 26·45 l 26·27 l 25·22	″ l 27·86 l 28·02 l 28·44	″ h 26·11 h 25·26 l 25·75	″ h 28·09 h 27·46 l 27·46	″ l 26·79 l 25·55 l 25·97	″ l 28·51 l 27·82 l 27·22	$M = 26''\cdot83$ $w = 10\cdot60$ $\frac{1}{w} = 0\cdot09$ $C = 21^\circ\ 37'\ 26''\cdot83$
	26·81	25·90	26·53	27·60	25·98	28·11	25·71	27·67	26·10	27·85	
LXXX (Musal Tívu) and LXXVIII (Válai Tívu)	h 48·88 l 46·90 l 46·36	h 47·47 h 49·41 h 49·52	l 45·15 l 46·92 l 47·02	l 46·70 l 47·57 l 47·63	l 47·88 l 48·21 l 46·60	l 45·63 l 46·81 l 47·60	h 48·53 h 48·84 h 49·33	h 46·91 h 48·78 l 46·85	l 46·33 l 47·77 l 48·45	l 45·98 l 46·74 l 46·66	$M = 47''\cdot45$ $w = 10\cdot50$ $\frac{1}{w} = 0\cdot10$ $C = 46^\circ\ 49'\ 47''\cdot45$
	47·38	48·80	46·36	47·30	47·56	46·68	48·90	47·51	47·52	46·46	
LXXVIII (Válai Tívu) and LXXVI (Appa Tívu)	h 19·62 l 21·66 l 21·42	h 18·59 h 19·60 h 20·71	l 20·98 l 19·09 l 19·61	l 21·67 l 21·43 l 21·94	l 21·27 l 22·83 h 20·97	l 21·84 l 21·73 l 20·41	h 21·34 h 21·35 h 19·92	h 20·22 h 18·84 h 18·94	l 19·22 l 18·91 l 20·46	l 20·25 l 19·45 l 19·00	$M = 20''\cdot44$ $w = 9\cdot30$ $\frac{1}{w} = 0\cdot11$ $C = 70^\circ\ 18'\ 20''\cdot44$
	20·90	19·63	19·89	21·68	21·69	21·33	20·87	19·33	19·53	19·57	
LXXVI (Appa Tívu) and LIX (Kánjarangudi)	h 60·09 h 59·06 l 59·93	h 61·14 h 58·79 l 58·75	l 59·19 l 59·79 l 60·94	l 57·71 l 59·37 l 58·11	l 59·09 l 59·05 h 59·34	l 58·30 l 58·24 l 57·84	h 59·47 h 59·06 l 58·69	h 61·43 h 60·00 h 60·18	l 59·97 l 60·72 l 59·08	l 60·36 l 59·00 l 60·87	$M = 59''\cdot45$ $w = 13\cdot90$ $\frac{1}{w} = 0\cdot07$ $C = 44^\circ\ 33'\ 59''\cdot45$
	59·69	59·56	59·97	58·40	59·16	58·13	59·07	60·54	59·92	60·08	

At LXXVIII (Válai Tívu)

April 1875; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXVI (Appa Tívu)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	
LXXVI (Appa Tívu) and LIX (Kánjarangudi)	″ l 48·51 l 49·66 l 48·98	″ l 51·94 l 51·60 l 51·74	″ l 52·19 l 51·06 l 51·19	″ l 50·63 l 51·99 l 50·03	″ l 49·78 l 50·68 l 50·39	″ l 49·90 l 50·41 l 50·66	″ h 50·83 h 51·17 h 50·73	″ h 50·29 l 48·64 l 50·25	″ l 51·30 l 49·38 l 51·16	″ l 49·32 l 48·21 l 48·42	$M = 50''\cdot37$ $w = 9\cdot20$ $\frac{1}{w} = 0\cdot11$ $C = 35^\circ\ 28'\ 50''\cdot37$
	49·05	51·76	51·48	50·88	50·28	50·32	50·91	49·73	50·61	48·65	

At LXXVIII (Válai Tívu)—(*Continued*).

Angle between	0° 1′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 50′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	Circle readings, telescope being set on LXXVI (Appa Tívu)										
	″	″	″	″	″	″	″	″	″	″	
LIX (Kánjarangudi)	l 39·62	l 39·52	l 38·69	l 38·81	l 37·79	l 37·23	h 39·25	h 38·78	l 38·18	l 39·81	$M = 38''{\cdot}82$
and	l 39·57	l 38·97	l 39·48	l 38·48	l 37·85	l 37·60	h 37·97	l 38·33	l 39·27	l 40·75	$w = 16{\cdot}90$
LXXVII (Pĕriyapatnam)	l 38·96	l 38·77	l 37·45	l 40·05	l 39·64	l 37·71	h 37·85	l 39·93	l 38·62	l 39·62	$\frac{1}{w} = 0{\cdot}06$
	39·38	39·09	38·54	39·11	38·43	37·51	38·36	39·01	38·69	40·06	$C = 37° 39' 38''{\cdot}82$
LXXVII (Pĕriyapatnam)	l 10·19	l 8·43	l 10·67	l 9·01	l 9·89	l 9·38	h 10·94	l 8·50	l 9·87	l 9·84	$M = 9''{\cdot}42$
and	l 8·24	l 8·90	l 9·58	l 8·65	l 10·13	l 8·74	l 9·86	l 7·43	l 10·22	l 8·25	$w = 14{\cdot}70$
LXXIX (Rámaswámi Madam)	l 9·45	l 10·12	l 11·20	l 9·57	l 9·59	l 8·24	l 10·26	l 7·91	l 9·53	l 9·88	$\frac{1}{w} = 0{\cdot}07$
	9·29	9·15	10·48	9·08	9·87	8·79	10·35	7·95	9·87	9·32	$C = 82° 55' 9''{\cdot}42$
LXXIX (Rámaswámi Madam)	l 60·18	l 61·23	l 59·93	l 61·18	l 60·79	l 62·48	h 62·04	l 61·69	l 61·68	l 61·88	$M = 61''{\cdot}49$
and	l 60·92	l 60·76	l 60·79	l 62·53	l 61·60	l 62·90	l 61·83	l 61·89	l 61·77	l 62·52	$w = 21{\cdot}70$
LXXX (Musal Tívu)	l 61·61	l 59·66	l 62·26	l 62·17	l 60·67	l 61·81	l 61·24	l 62·36	l 61·03	l 61·29	$\frac{1}{w} = 0{\cdot}05$
	60·90	60·55	60·99	61·96	61·02	62·40	61·70	61·98	61·49	61·90	$C = 25° 22' 1''{\cdot}49$

At LXXIX (Rámaswámi Madam)

***April* 1875; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	180° 22′	0° 22′	259° 33′	79° 33′	338° 45′	158° 45′	57° 57′	237° 57′	137° 9′	317° 10′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	Circle readings, telescope being set on LXXXI (Marakayárpatnam)										
	″	″	″	″	″	″	″	″	″	″	
LXXXI (Marakayárpatnam)	l 23·31	l 22·15	l 21·80	h 22·22	l 22·36	l 21·71	l 21·72	l 24·85	l 23·02	h 24·38	$M = 22''{\cdot}57$
and	l 21·90	l 22·39	l 21·50	h 21·82	l 22·57	l 23·83	l 20·76	l 22·81	l 21·92	h 23·87	$w = 9{\cdot}80$
LXXXII (Púmurichán)	l 23·48	l 21·89	l 22·32	h 21·01	l 24·35	l 22·39	l 21·73	l 23·11	h 21·15	h 24·92	$\frac{1}{w} = 0{\cdot}10$
	22·90	22·14	21·87	21·68	23·09	22·64	21·40	23·59	22·03	24·39	$C = 18° 57' 22''{\cdot}57$
LXXXII (Púmurichán)	l 30·60	l 29·49	l 29·80	h 29·53	l 29·66	l 31·31	l 28·88	l 28·82	l 30·35	h 28·26	$M = 29''{\cdot}72$
and	l 29·31	l 29·43	l 30·09	h 29·29	l 30·42	l 31·02	l 30·06	l 29·52	l 30·24	h 29·57	$w = 19{\cdot}20$
LXXX (Musal Tívu)	l 29·60	l 30·98	l 28·95	h 27·94	l 30·54	l 29·33	l 30·13	l 28·20	h 31·13	h 29·20	$\frac{1}{w} = 0{\cdot}05$
	29·84	29·97	29·61	28·92	30·21	30·55	29·69	28·85	30·57	29·01	$C = 69° 33' 29''{\cdot}72$

At LXXIX (Rámaswámi Madam)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXXI (Marakayárpatnam) 180° 22′	0° 22′	259° 38′	79° 33′	338° 45′	158° 45′	57° 57′	237° 57′	137° 9′	317° 10′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXX (Musal Tívu) and LXXVIII (Válai Tívu)	l 27·10	l 26·67	l 26·68	h 26·99	l 28·12	l 25·62	l 27·88	l 28·37	l 26·24	h 27·07	$M = 27''\cdot11$
	l 26·38	l 27·83	l 28·62	h 26·51	l 26·21	l 27·16	l 28·31	l 28·11	l 26·54	h 26·74	$w = 15\cdot47$
	l 26·39	l 26·15	l 27·33	h 27·54	l 26·54	l 26·66	l 28·45	l 28·75	h 25·24	h 27·80	$\frac{1}{w} = 0\cdot06$
			l 26·82								
	26·62	26·88	27·36	27·01	26·96	26·48	28·21	28·41	26·01	27·20	$C = 63^\circ\ 11'\ 27''\cdot11$
LXXVIII (Válai Tívu) and LXXVII (Pĕriyapatnam)	l 37·18	l 36·24	l 37·01	h 36·61	l 36·19	l 36·86	l 37·33	l 37·44	l 35·52	h 36·24	$M = 36''\cdot60$
	l 37·26	l 35·53	l 38·05	h 37·46	l 36·80	l 36·17	l 35·78	l 36·94	l 35·86	h 36·37	$w = 23\cdot80$
	l 38·14	l 36·35	l 36·53	h 35·58	l 37·95	l 35·38	l 36·98	l 35·76	h 35·59	h 36·77	$\frac{1}{w} = 0\cdot04$
	37·53	36·04	37·20	36·55	36·98	36·14	36·70	36·71	35·66	36·46	$C = 28^\circ\ 37'\ 36''\cdot60$

At LXXX (Musal Tívu)

***April* 1875; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on LXXVIII (Válai Tívu) 0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 50′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXVIII (Válai Tívu) and LXXVII (Pĕriyapatnam)	l 2·01	l 1·87	l 3·08	l 2·70	l 3·09	l 1·00	h 2·00	l 1·70	l 0·09	h 0·94	$M = 1''\cdot85$
	l 2·38	l 1·13	l 1·75	l 1·46	l 3·32	l 1·23	h 2·78	l 1·98	h 0·60	h 2·21	$w = 20\cdot00$
	l 0·33	l 1·96	h 3·16	l 1·54	l 2·37	l 2·16	h 2·05	l 1·21	h 1·55	h 1·79	$\frac{1}{w} = 0\cdot05$
	1·57	1·65	2·66	1·90	2·93	1·46	2·28	1·63	0·75	1·65	$C = 24^\circ\ 53'\ 1''\cdot85$
LXXVII (Pĕriyapatnam) and LXXIX (Rámaswámi Madam)	l 30·03	l 29·75	l 30·13	l 29·48	l 29·09	l 31·46	h 28·33	l 31·26	l 27·91	h 30·14	$M = 29''\cdot78$
	l 29·72	l 29·48	h 31·34	l 28·00	l 29·27	l 30·07	h 28·25	l 30·29	h 28·49	h 31·08	$w = 9\cdot60$
	l 31·03	l 29·71	h 30·60	l 29·43	l 28·37	l 31·38	h 30·34	l 31·19	h 27·97	h 29·27	$\frac{1}{w} = 0\cdot10$
	30·26	29·65	30·69	29·17	28·91	30·97	28·97	30·91	28·12	30·16	$C = 66^\circ\ 33'\ 29''\cdot78$
LXXIX (Rámaswámi Madam) and LXXXI (Marakayárpatnam)	l 57·74	l 58·71	l 60·71	l 57·52	l 60·49	l 58·63	l 59·12	l 59·75	l 60·90	l 58·68	$M = 59''\cdot27$
	l 59·52	l 58·60	l 60·32	l 59·28	l 59·86	l 58·23	l 59·12	l 60·77	h 58·23	l 59·52	$w = 17\cdot20$
	l 58·75	l 60·19	h 59·02	l 58·52	l 58·63	l 57·78	l 60·16	l 59·87	h 59·77	l 59·68	$\frac{1}{w} = 0\cdot06$
	58·67	59·17	60·02	58·44	59·66	58·21	59·47	60·13	59·63	59·29	$C = 49^\circ\ 12'\ 59''\cdot27$

At LXXX (Musal Tívu)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXVIII (Válai Tívu)										M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 50′	
	″	″	″	″	″	″	″	″	″	″	
LXXXI (Marakayárpatnam) and LXXXII (Púmurichán)	l 20·36	l 20·60	l 19·78	l 21·69	l 21·50	l 19·64	l 20·06	l 21·23	l 21·06	l 19·44	M = 20″·71
	l 20·69	l 22·07	l 18·34	l 22·15	l 21·27	l 21·57	l 20·99	l 21·19	h 20·04	l 20·13	w = 13·70
	l 20·30	l 21·25	l 18·60	l 20·85	l 20·77	l 20·80	l 22·36	l 20·48	h 21·80	l 20·31	1/w = 0·07
	20·45	21·31	18·91	21·56	21·18	20·67	21·14	20·97	20·97	19·96	C = 31° 16′ 20″·71

At LXXXI (Marakayárpatnam)

**April* 1875; *and* †*April* 1876; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXIV (Pisásu Mundal)										M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	7° 25′	187° 25′	86° 37′	266° 37′	165° 49′	345° 49′	245° 1′	65° 1′	324° 14′	144° 14′	
	″	″	″	″	″	″	″	″	″	″	
† LXXXIV (Pisásu Mundal) and LXXXIII (Gandhamána)	l 30·07	l 29·42	l 30·90	l 31·80	l 31·47	l 30·20	l 30·66	l 30·58	l 30·56	l 30·52	M = 30″·39
	l 29·85	l 29·74	l 29·62	l 30·22	l 32·29	l 30·02	l 30·99	l 30·34	l 31·73	l 29·50	w = 13·50
	l 28·64	l 30·47	l 28·79	l 29·77	l 31·76	l 29·94	l 30·84	l 29·93	l 32·20	l 28·88	1/w = 0·07
	29·52	29·88	29·77	30·60	31·84	30·05	30·83	30·28	31·50	29·63	C = 7° 24′ 30″·39

Angle between	Circle readings, telescope being set on LXXXIII (Gandhamána)										
	182° 10′	2° 10′	261° 20′	81° 21′	340° 32′	160° 32′	59° 44′	239° 45′	138° 57′	318° 57′	
	″	″	″	″	″	″	″	″	″	″	
* LXXXIII (Gandhamána) and LXXXII (Púmurichán)	h 42·84	h 43·34	l 41·84	h 43·43	h 43·73	h 44·76	l 43·35	l 42·52	l 40·86	l 44·14	
	h 44·97	l 42·55	l 41·62	h 44·42	l 41·75	l 42·17	l 42·29	l 43·05	l 41·42	l 43·43	M = 43″·00
	h 43·78	h 44·04	l 42·09	h 44·64	l 42·21	l 43·44	l 43·53	l 41·80	l 41·82	l 43·77	
									l 41·67	l 44·16	w = 12·26
									l 42·86	l 42·64	1/w = 0·08
									l 41·73	l 43·11	
	43·86	43·31	41·85	44·16	42·56	43·46	43·06	42·46	41·73	43·54	C = 42° 57′ 42″·99
* LXXXII (Púmurichán) and LXXX (Musal Tívu)	h 42·54	h 44·47	l 43·46	h 44·45	h 44·53	h 43·85	l 43·94	l 43·69	l 46·92	l 41·42	
	h 41·62	l 43·90	l 45·27	h 43·23	h 43·12	l 44·82	l 44·54	l 43·04	l 47·18	l 41·35	M = 43″·96
	h 42·84	h 43·38	l 44·98	h 42·89	h 45·19	l 44·85	l 44·58	l 44·48	l 46·75	l 41·69	
									l 46·06	l 42·43	w = 5·94
									l 45·47	l 42·71	1/w = 0·17
									l 46·35	l 42·11	
	42·33	43·92	44·57	43·52	44·28	44·51	44·35	43·74	46·46	41·95	C = 96° 53′ 43″·96
* LXXX (Musal Tívu) and LXXIX (Rámaswámi Madam)	h 7·22	h 4·45	l 8·01	h 6·63	h 7·31	h 6·62	l 6·88	l 8·15	l 8·12	l 8·15	M = 6″·96
	h 7·19	l 5·83	l 5·90	h 7·94	h 7·71	h 8·77	l 5·78	l 7·18	l 6·13	l 8·60	w = 14·70
	h 6·86	h 5·89	l 6·63	h 6·42	l 5·41	l 7·17	l 7·16	l 6·67	h 6·33	l 7·69	1/w = 0·07
	7·09	5·39	6·85	7·00	6·81	7·52	6·61	7·33	6·86	8·15	C = 42° 16′ 6″·96

At LXXXII (Púmurichán)

******April* 1875 ; *and* †*April* 1876 ; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXX (Musal Tívu)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 2′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 50′	
* LXXX (Musal Tívu) and LXXIX (Rámaswámi Madam)	″ h 8·64 l 8·52 l 8·16	″ l 9·53 l 11·24 l 8·08	″ l 8·76 h 8·33 h 7·99	″ h 10·34 h 10·45 h 8·99	″ h 8·71 h 7·97 h 8·84	″ h 8·75 h 7·72 h 9·13	″ h 8·59 h 10·20 h 8·88 h 10·39	″ l 8·75 l 7·76 l 8·61	″ l 7·64 l 7·33 l 7·97	″ l 7·27 l 7·97 l 7·88	$M = 8''\cdot66$ $w = 13\cdot56$ $\frac{1}{w} = 0\cdot07$ $C = 29° 57' 8''\cdot66$
	8·44	9·62	8·36	9·93	8·51	8·53	9·52	8·37	7·65	7·71	
* LXXIX (Rámaswámi Madam) and LXXXI (Marakayárpatnam)	h 44·61 l 46·78 l 44·42	l 44·83 l 43·11 l 44·91	l 46·70 l 46·72 l 45·74	h 45·46 h 45·18 h 46·38	h 47·01 h 46·00 h 46·80	h 47·74 h 47·29 h 45·57	h 46·63 h 45·87 h 46·50 h 46·39	h 44·54 l 46·35 l 46·55	l 46·02 l 46·50 l 45·74	l 45·42 l 47·41 l 46·56	$M = 45''\cdot98$ $w = 13\cdot38$ $\frac{1}{w} = 0\cdot07$ $C = 21° 52' 45''\cdot98$
	45·27	44·28	46·39	45·67	46·60	46·87	46·35	45·81	46·09	46·46	
* LXXXI (Marakayárpatnam) and LXXXIII (Gandhamána)	h 32·47 l 31·44 l 33·86	l 33·25 l 33·17 l 32·96	l 32·17 l 30·80 l 32·00	h 34·15 h 33·26 h 34·72	h 30·55 h 33·01 h 30·74	h 28·72 h 30·83 h 31·64	h 31·47 h 32·23 h 31·52	h 32·23 l 32·15 l 32·03	l 31·24 l 31·15 l 33·31	l 32·89 l 31·19 l 30·85	$M = 32''\cdot07$ $w = 8\cdot20$ $\frac{1}{w} = 0\cdot12$ $C = 119° 55' 32''\cdot07$
	32·59	33·13	31·66	34·04	31·43	30·40	31·74	32·14	31·90	31·64	
	Circle readings, telescope being set on LXXXIII (Gandhamána)										
	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 50′	
† LXXXIII (Gandhamána) and LXXXV (Masánam Karai)	″ l 44·10 l 44·74 l 43·84	″ l 46·16 l 44·90 l 44·36	″ l 45·54 l 45·41 l 44·93	″ l 45·40 l 45·69 l 45·34	″ l 43·69 l 44·26 l 43·93	″ l 43·76 l 44·37 l 43·74	″ l 44·62 l 45·75 l 45·79	″ l 45·12 l 44·15 l 45·00	″ l 44·99 l 45·77 l 44·20	″ l 44·19 l 45·75 l 46·14	$M = 44''\cdot86$ $w = 22\cdot20$ $\frac{1}{w} = 0\cdot05$ $C = 16° 16' 44''\cdot86$
	44·23	45·14	45·29	45·48	43·96	43·96	45·39	44·76	44·99	45·36	

At LXXXIII (Gandhamána)

April 1876 ; *observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXV (Masánam Karai)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 1′	79° 18′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 50′	
LXXXV (Masánam Karai) and LXXXII (Púmurichán)	″ l 21·47 l 20·99 l 22·19	″ l 21·14 l 21·35 l 20·85	″ l 22·37 l 20·71 l 20·81	″ l 21·06 l 20·84 l 20·58	″ l 19·25 l 21·30 l 21·07	″ l 20·67 l 20·26 l 20·42	″ l 21·43 l 21·81 l 20·72	″ l 20·39 l 19·71 l 20·63	″ l 20·28 l 19·31 l 20·98	″ l 19·72 l 19·04 l 20·33	$M = 20''\cdot72$ $w = 21\cdot70$ $\frac{1}{w} = 0\cdot05$ $C = 82° 21' 20''\cdot72$
	21·55	21·11	21·30	20·83	20·54	20·45	21·32	20·24	20·19	19·70	

At LXXXIII (Gandhamána)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXXV (Masánam Karai) 0° 1′	180° 1′	79° 18′	259° 18′	158° 25′	338° 25′	237° 37′	57° 37′	316° 50′	136° 50′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXII (Púmurichán)	l 42·85	l 42·37	l 43·34	l 43·94	l 44·96	l 42·80	l 43·26	l 42·76	l 45·00	l 44·00	$M = 43''·57$
and	l 43·60	l 44·09	l 42·80	l 44·47	l 42·64	l 43·55	l 43·21	l 42·57	l 45·90	l 43·54	$w = 16·90$
LXXXI (Marakayárpatnam)	l 42·77	l 44·11	l 42·49	l 44·42	l 43·83	l 43·78	l 43·28	l 43·11	l 44·51	l 43·09	$\frac{1}{w} = 0·06$
	43·07	43·52	42·88	44·28	43·81	43·38	43·25	42·81	45·14	43·54	$C = 17° 6' 43''·57$
LXXXI (Marakayárpatnam)	l 40·39	l 42·19	l 40·11	l 39·88	l 38·53	l 42·08	l 40·33	l 41·38	l 40·71	l 41·57	$M = 40''·52$
and	l 40·32	l 40·05	l 41·77	l 39·23	l 39·54	l 40·40	l 39·81	l 42·83	l 40·22	l 39·47	$w = 8·80$
LXXXIV (Pisásu Mundal)	l 39·68	l 40·45	l 40·71	l 40·15	l 37·82	l 41·88	l 39·93	l 42·42	l 39·72	l 41·89	$\frac{1}{w} = 0·11$
	40·13	40·90	40·86	39·75	38·63	41·45	40·02	42·21	40·22	40·98	$C = 110° 49' 40''·52$
LXXXIV (Pisásu Mundal)	l 31·87	l 33·57	l 33·86	l 33·41	l 33·13	l 32·55	l 32·51	l 32·93	l 33·27	l 31·98	$M = 33''·05$
and	l 31·98	l 33·25	l 31·48	l 33·50	l 34·33	l 33·20	l 33·46	l 32·23	l 32·68	l 33·32	$w = 20·40$
LXXXVI (Kachi Tívu, N.)	l 32·56	l 33·39	l 33·46	l 33·12	l 35·15	l 33·03	l 32·76	l 32·41	l 34·95	l 32·13	$\frac{1}{w} = 0·05$
	32·14	33·40	32·93	33·34	34·20	32·93	32·91	32·52	33·63	32·48	$C = 55° 4' 33''·05$
LXXXVI (Kachi Tívu, N.)	l 59·31	l 59·25	l 59·39	l 60·85	l 59·15	l 60·25	l 59·99	l 58·88	l 59·23	l 60·45	$M = 59''·53$
and	l 60·32	l 58·90	l 60·84	l 59·56	l 58·29	l 59·11	l 58·70	l 59·69	l 60·21	l 59·44	$w = 33·30$
LXXXVII (Kachi Tívu, S.)	l 59·75	l 58·29	l 59·07	l 59·22	l 58·76	l 58·71	l 60·47	l 59·57	l 60·28	l 59·91	$\frac{1}{w} = 0·03$
	59·79	58·81	59·77	59·88	58·73	59·36	59·72	59·38	59·91	59·93	$C = 2° 33' 59''·53$
LXXXVII (Kachi Tívu, S.)	l 44·41	l 41·69	l 41·35	l 40·07	l 44·42	l 40·61	l 42·47	l 42·56	l 42·08	l 41·88	$M = 42''·13$
and	l 42·41	l 41·38	l 42·31	l 41·91	l 42·23	l 42·47	l 42·77	l 41·60	l 41·74	l 41·23	$w = 16·40$
LXXXV (Masánam Karai)	l 42·53	l 41·38	l 42·25	l 42·43	l 43·81	l 41·86	l 42·20	l 41·89	l 42·11	l 41·88	$\frac{1}{w} = 0·06$
	43·12	41·48	41·97	41·47	43·49	41·65	42·48	42·02	41·98	41·66	$C = 92° 3' 42''·13$

At LXXXIV (Pisásu Mundal)

April 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24*-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXVI (Kachi Tívu, N.) 181° 12′	1° 12′	260° 24′	80° 24′	339° 36′	159° 36′	58° 48′	238° 48′	138° 1′	318° 1′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXVI (Kachi Tívu, N.)	l 24·81	l 23·25	l 26·75	l 24·52	l 27·33	l 25·76	l 28·25	l 28·77	l 23·06	l 28·34	$M = 25''·22$
and	l 25·26	l 22·50	l 26·79	l 25·07	l 26·97	l 22·67	l 23·40	l 23·93	l 22·52	l 26·76	$w = 3·30$
LXXXIII (Gandhamána)	l 25·75	l 25·00	l 25·53	l 22·83	l 28·69	l 22·26	l 24·45	l 24·48	l 24·10	l 26·79	$\frac{1}{w} = 0·30$
	25·27	23·58	26·36	24·14	27·66	23·56	25·37	25·73	23·23	27·30	$C = 119° 25' 25''·22$

At LXXXIV (Pisásu Mundal)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXXVI (Kachi Tívu, N.)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	181° 12′	1° 12′	260° 24′	80° 24′	339° 36′	159° 36′	58° 48′	238° 48′	138° 1′	318° 1′	
LXXXIII (Gandhamána)	″	″	″	″	″	″	″	″	″	″	
and	l 48·23	l 48·37	l 48·82	l 48·17	l 49·16	l 49·88	l 48·50	l 47·50	l 50·04	l 46·90	$M = 48''\cdot39$
LXXXI (Marakayárpatnam)	l 49·44	l 48·78	l 47·96	l 48·13	l 47·23	l 47·96	l 47·49	l 45·49	l 49·18	l 50·68	$w = 16\cdot40$
	l 47·97	l 47·90	l 47·70	l 47·65	l 46·85	l 49·91	l 49·15	l 50·62	l 48·03	l 48·02	$\frac{1}{w} = 0\cdot06$
	48·55	48·35	48·16	47·98	47·75	49·25	48·38	47·87	49·08	48·53	$C = 61^\circ 45' 48''\cdot39$

At LXXXV (Masánam Karai)

April 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXII (Púmurichán)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 0′	180° 0′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 54′	136° 54′	
LXXXII (Púmurichán)	″	″	″	″	″	″	″	″	″	″	
and	l 52·81	l 53·51	l 53·72	l 54·64	l 53·94	l 52·54	l 57·90	l 56·61	l 54·35	l 52·79	$M = 54''\cdot38$
LXXXIII (Gandhamána)	l 55·86	l 53·91	l 54·02	l 54·41	l 52·98	l 53·03	l 56·82	l 56·09	l 55·70	l 53·90	$w = 6\cdot80$
	l 54·64	l 53·94	l 53·72	l 54·52	l 53·71	l 52·83	l 55·39	l 54·62	l 54·20	l 54·17	$\frac{1}{w} = 0\cdot15$
	54·44	53·79	53·82	54·52	53·54	52·80	56·70	55·77	54·75	53·62	$C = 81^\circ 21' 54''\cdot38$
LXXXIII (Gandhamána)	l 62·25	l 61·79	l 61·27	l 63·35	l 62·29	l 63·26	l 61·82	l 61·78	l 62·14	l 61·29	$M = 62''\cdot12$
and	l 61·38	l 61·15	l 62·88	l 62·58	l 63·36	l 62·42	l 63·53	l 61·82	l 62·19	l 59·38	$w = 13\cdot30$
LXXXVII (Kachi Tívu, S.)	l 62·68	l 61·33	l 62·51	l 62·09	l 62·97	l 63·14	l 63·13	l 62·24	l 61·18	l 60·29	$\frac{1}{w} = 0\cdot08$
	62·10	61·42	62·22	62·67	62·87	62·94	62·83	61·95	61·84	60·32	$C = 78^\circ 34' 2''\cdot12$

At LXXXVI (Kachi Tívu, N.)

April 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXVIII (Ámanakamunai)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	
LXXXVIII (Ámanakamunai)	″	″	″	″	″	″	″	″	″	″	
and	l 30·57	l 31·78	l 30·51	l 33·33	l 31·41	l 29·66	l 31·54	l 28·89	l 31·49	l 29·40	$M = 30''\cdot85$
LXXXIX (Úrimunai)	l 31·39	l 30·79	l 29·75	l 32·45	l 30·02	l 30·42	l 30·31	l 31·32	l 28·91	l 28·13	$w = 11\cdot16$
	l 30·07	l 30·46	l 32·06	l 32·55	l 30·90	l 31·00	l 30·83	l 32·60	l 31·29	l 30·81	$\frac{1}{w} = 0\cdot09$
						l 31·97		l 30·64			
	30·68	31·01	30·77	32·78	30·78	30·76	30·89	30·86	30·56	29·45	$C = 27^\circ 46' 30''\cdot85$

At LXXXVI (Kachi Tívu, N.)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXXVIII (Ámanakamunai) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXIX (Úrimunai) and LXXXVII (Kachi Tívu, S.)	l 49·65	l 50·34	l 48·56	l 50·92	l 48·20	l 50·52	l 46·11	l 49·19	l 46·46	l 47·15	$M = 48''\cdot49$
	l 49·89	l 52·23	l 48·19	l 50·85	l 50·63	l 49·15	l 47·38	l 45·84	l 46·55	l 46·27	$w = 3\cdot22$
	l 49·87	l 49·62	l 47·60	l 50·60	l 49·98	l 47·99	l 46·80	l 47·13	l 45·46	l 46·90	$\frac{1}{w} = 0\cdot31$
						l 46·31		l 48·52			
	49·80	50·73	48·12	50·79	49·60	48·49	46·76	47·67	46·16	46·77	$C = 79^\circ\ 58'\ 48''\cdot49$
LXXXVII (Kachi Tívu, S.) and LXXXIII (Gandhamána)	l 21·91	l 21·43	l 22·00	l 17·53	l 21·08	l 20·90	l 23·75	l 24·77	l 23·54	l 25·76	$M = 22''\cdot81$
	l 21·45	l 20·42	l 24·54	l 20·13	l 21·15	l 24·52	l 25·51	l 24·56	l 24·97	l 24·57	$w = 2\cdot30$
	l 22·49	l 21·56	l 22·75	l 19·24	l 20·21	l 23·81	l 24·60	l 24·38	l 26·06	l 24·19	$\frac{1}{w} = 0\cdot43$
						l 23·79					
	21·95	21·14	23·10	18·97	20·81	23·26	24·62	24·57	24·86	24·84	$C = 100^\circ\ 10'\ 22''\cdot81$
LXXXIII (Gandhamána) and LXXXIV (Pisásu Mundal)	l 60·82	l 59·03	l 58·01	l 60·21	l 64·63	l 61·47	l 61·80	l 61·09	l 61·63	l 60·87	$M = 60''\cdot62$
	l 60·80	l 57·43	l 60·32	l 58·60	l 63·39	l 60·17	l 61·21	l 60·55	l 60·00	l 61·03	$w = 5\cdot10$
	l 61·10	l 58·61	l 60·22	l 60·36	l 62·66	l 60·64	l 60·65	l 60·17	l 61·09	l 59·99	$\frac{1}{w} = 0\cdot20$
	60·91	58·36	59·52	59·72	63·56	60·76	61·22	60·60	60·91	60·63	$C = 5^\circ\ 30'\ 0''\cdot62$

At LXXXVII (Kachi Tívu, S.)

April 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXV (Masánam Karai) 183° 46′	3° 46′	262° 58′	82° 58′	342° 10′	162° 10′	61° 22′	241° 22′	140° 35′	320° 35′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXV (Masánam Karai) and LXXXIII (Gandhamána)	l 17·60	l 17·66	h 14·25	h 14·84	h 16·36	h 18·52	h 15·76	h 14·30	l 17·18	l 14·48	$M = 16''\cdot03$
	l 17·52	l 18·38	h 14·38	h 15·92	h 14·30	h 18·93	h 13·78	h 19·36	l 16·89	l 14·51	$w = 4\cdot40$
	l 16·44	l 15·74	l 13·43	l 14·45	h 14·90	h 17·40	h 15·32	h 16·91	l 16·40	l 14·92	$\frac{1}{w} = 0\cdot23$
	17·19	17·26	14·02	15·07	15·19	18·28	14·95	16·86	16·82	14·64	$C = 9^\circ\ 22'\ 16''\cdot03$
LXXXIII (Gandhamána) and LXXXVI (Kachi Tívu, N.)	l 31·84	l 31·05	l 30·83	l 32·50	l 30·73	l 32·84	h 32·19	h 29·50	l 31·42	l 31·69	$M = 31''\cdot41$
	l 32·31	l 29·34	l 31·50	l 33·73	l 29·29	l 32·45	h 31·42	h 31·04	l 30·17	l 31·50	$w = 10\cdot00$
	l 30·83	l 31·85	l 31·45	l 33·54	l 29·80	l 31·73	h 31·17	h 31·38	l 31·24	l 31·94	$\frac{1}{w} = 0\cdot10$
	31·66	30·75	31·26	33·26	29·94	32·34	31·59	30·64	30·94	31·71	$C = 77^\circ\ 15'\ 31''\cdot41$

At LXXXVII (Kachi Tívu, S.)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXXV (Masánam Karai) 183° 46′	3° 46′	262° 58′	82° 58′	342° 10′	162° 10′	61° 22′	241° 22′	140° 35′	320° 35′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXVI (Kachi Tívu, N.) and LXXXVIII (Ámanakamunai)	*l* 45·86 *l* 45·84 *l* 46·35	*l* 45·81 *l* 46·58 *l* 46·20	*l* 45·57 *l* 46·10 *l* 46·80	*l* 44·51 *l* 44·14 *l* 43·70	*l* 47·36 *l* 48·08 *l* 47·02	*l* 46·40 *l* 46·36 *l* 45·01	*h* 46·53 *h* 44·72 *h* 45·54	*h* 46·80 *h* 46·75 *h* 45·90	*l* 44·90 *l* 47·38 *l* 45·45	*l* 45·00 *l* 47·79 *l* 45·01	$M = 45''·98$ $w = 11·80$ $\frac{1}{w} = 0·08$
	46·02	46·20	46·16	44·12	47·49	45·92	45·60	46·48	45·91	45·93	$C = 69° 27' 45''·98$
LXXXVIII (Ámanakamunai) and LXXXIX (Úrimunai)	*l* 46·37 *l* 44·62 *l* 44·73	*l* 43·26 *l* 44·38 *l* 42·76	*l* 46·21 *l* 44·88 *l* 46·08	*l* 44·38 *l* 44·48 *l* 44·50	*l* 44·11 *l* 45·30 *l* 45·53	*l* 44·11 *l* 43·12 *l* 43·86	*h* 45·60 *h* 46·41 *h* 47·80	*h* 44·01 *h* 44·20 *h* 44·88	*l* 44·63 *l* 43·56 *l* 45·74	*l* 44·99 *l* 44·14 *l* 46·61	$M = 44''·84$ $w = 9·60$ $\frac{1}{w} = 0·10$
	45·24	43·47	45·72	44·45	44·98	43·70	46·60	44·36	44·64	45·25	$C = 27° 39' 44''·84$

At LXXXVIII (Ámanakamunai)

March 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXIX (Úrimunai) 0° 0′	180° 0′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXIX (Úrimunai) and LXXXVII (Kachi Tívu, S.)	*l* 19·20 *l* 18·85 *l* 18·20	*l* 17·84 *l* 17·34 *l* 19·75	*l* 18·41 *l* 18·82 *l* 19·42	*l* 18·49 *l* 19·73 *l* 19·30	*l* 19·92 *l* 20·31 *l* 18·51	*l* 16·94 *l* 16·27 *l* 18·47	*h* 19·53 *h* 19·68 *h* 16·68	*h* 19·75 *h* 20·86 *h* 21·04	*h* 21·15 *h* 20·83 *h* 21·35	*h* 15·53 *h* 17·04 *h* 17·25	$M = 18''·88$ $w = 4·90$ $\frac{1}{w} = 0·20$
	18·75	18·31	18·88	19·17	19·58	17·23	18·63	20·55	21·11	16·61	$C = 75° 26' 18''·88$
LXXXVII (Kachi Tívu, S.) and LXXXVI (Kachi Tívu, N.)	*l* 60·24 *l* 60·40 *l* 61·50	*l* 61·47 *l* 59·30 *l* 59·76	*l* 62·64 *l* 61·53 *l* 60·71	*l* 59·07 *l* 59·14 *l* 59·35	*l* 60·95 *l* 62·66 *l* 61·06	*l* 62·14 *l* 62·17 *l* 61·16	*h* 57·74 *h* 59·12 *h* 59·14	*h* 59·39 *h* 58·51 *h* 60·38	*h* 58·18 *h* 58·54 *h* 58·13	*h* 58·07 *h* 59·76 *h* 61·32	$M = 60''·12$ $w = 5·50$ $\frac{1}{w} = 0·18$
	60·71	60·18	61·63	59·19	61·56	61·82	58·67	59·43	58·28	59·72	$C = 2° 47' 0''·12$

At LXXXIX (Úrimunai)

March 1876; *observed by Mr. G. Belcham with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on LXXXVII (Kachi Tívu, S.) 76° 55′	256° 55′	156° 7′	336° 7′	235° 19′	55° 18′	314° 31′	134° 31′	33° 43′	213° 43′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXVII (Kachi Tívu, S.) and LXXXVI (Kachi Tívu, N.)	*l* 47·85 *l* 47·58 *l* 49·03	*l* 45·08 *l* 46·09 *l* 44·99	*l* 46·84 *l* 48·60 *l* 44·71 *l* 45·68	*l* 44·89 *l* 46·12 *l* 44·30	*l* 48·17 *l* 49·36 *h* 49·60	*h* 44·87 *l* 44·77 *l* 46·78	*l* 49·10 *l* 46·07 *l* 47·90	*l* 44·92 *l* 44·64 *l* 45·05	*l* 46·25 *l* 47·61 *l* 45·20 *l* 46·21	*l* 44·80 *l* 44·93 *l* 45·11	$M = 46''·34$ $w = 4·12$ $\frac{1}{w} = 0·24$
	48·15	45·39	46·46	45·10	49·04	45·47	47·69	44·87	46·32	44·95	$C = 2° 53' 46''·34$

At LXXXIX (Úrimunai)—(*Continued*).

Angle between	Circle readings, telescope being set on LXXXVII (Kachi Tívu, S.) 76° 55′	256° 55′	156° 7′	336° 7′	235° 19′	55° 18′	314° 31′	134° 31′	33° 43′	213° 43′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
LXXXVI (Kachi Tívu, N.) and LXXXVIII (Ámanakamunai)	*l* 8·41 *l* 13·59 *l* 13·11 *l* 9·18 *l* 8·67	*l* 11·83 *l* 11·64 *l* 11·46	*l* 10·29 *l* 8·76 *l* 10·83 *l* 11·61	*l* 11·00 *l* 12·32 *l* 12·55	*l* 9·13 *h* 8·03 *h* 9·68	*h* 10·58 *l* 10·80 *l* 10·99	*l* 9·07 *l* 8·22 *l* 6·92	*l* 10·61 *l* 10·78 *l* 9·81	*l* 7·29 *l* 8·66 *l* 7·66	*l* 11·20 *l* 11·02 *l* 12·09	$M = 10''·21$ $w = 4·05$ $\frac{1}{w} = 0·25$
	10·59	11·64	10·37	11·96	8·95	10·79	8·07	10·40	7·87	11·44	$C = 74° \; 0' \; 10''·21$

May 1883.

W. H. COLE,
In charge of Computing Office.

In the calculations of the weights of the observed angles by the formula given in Section 4 of Chapter VII of Volume II and illustrated by an example in the foot note to page 342 of the same Volume, it is necessary to employ the squares of the *apparent* errors of observation and graduation. These data have been employed to 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 instrument employed was Troughton and Simms' 24-inch Theodolite No. 1, having 5 microscopes to read the azimuth circle; observations were taken on 5 pairs of zeros (*face right* and *face left*) giving circle readings at 7° 12′ apart.

The *e.m.s. of observation* of a single measure of an angle $= \sqrt{\dfrac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$

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

Group	Observer and Instrument	Position of stations	Interval between microscope readings of circle	Number of: Measures on each zero (average)	Number of: Angles	Number of: Single measures	Number of: Single zeros	e. m. s. of observation of a single measure	e. m. s. of graduation and observation of a single zero
			° ′						
I	Lt.-Col. B. R. Branfill, Troughton and Simms' 24-inch Theodolite No. 1.	Plains,	7 12	3·09	146	4514	1460	$\left\{\frac{1980·96}{4514-1460}\right\}^{\frac{1}{2}} = \pm 0''·805$	$\left\{\frac{789·79}{1460-146}\right\}^{\frac{1}{2}} = \pm 0''·775$
II	Captain T. T. Carter, Troughton and Simms' 24-inch Theodolite No. 1.	„	7 12	3·13	24	751	240	$\left\{\frac{306·68}{751-240}\right\}^{\frac{1}{2}} = \pm 0\ ·775$	$\left\{\frac{101·18}{240-24}\right\}^{\frac{1}{2}} = \pm 0\ ·684$
III	Mr. G. Belcham, Troughton and Simms' 24-inch Theodolite No. 1.	„	7 12	3·07	140	4304	1400	$\left\{\frac{2292·80}{4304-1400}\right\}^{\frac{1}{2}} = \pm 0\ ·889$	$\left\{\frac{941·45}{1400-140}\right\}^{\frac{1}{2}} = \pm 0\ ·864$
IV	Captain T. T. Carter and Mr. G. Belcham, Troughton and Simms' 24-inch Theodolite No. 1.	„	7 12	3·23	27	872	270	$\left\{\frac{504·16}{872-270}\right\}^{\frac{1}{2}} = \pm 0\ ·915$	$\left\{\frac{175·21}{270-27}\right\}^{\frac{1}{2}} = \pm 0\ ·849$
I, II, III and IV	Lt.-Col. B. R. Branfill, Captain T. T. Carter and Mr. G. Belcham, Troughton and Simms' 24-inch Theodolite No. 1.	„	7 12	3·10	337	10441	3370	$\left\{\frac{5084·60}{10441-3370}\right\}^{\frac{1}{2}} = \pm 0\ ·848$	$\left\{\frac{2007·63}{3370-337}\right\}^{\frac{1}{2}} = \pm 0\ ·814$

May 1883.

W. H. COLE,
In charge of Computing Office.

SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. REDUCTION OF FIGURES.

Figure No. 55.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	67	11	28·89	·03
2	43	51	15·82	·08
3	68	57	18·27	·03
4	58	7	20·96	·08
5	68	41	56·78	·08
6	53	10	44·45	·06
7	56	3	23·51	·03
8	47	44	35·89	·03
9	76	12	2·79	·03
10	67	50	47·10	·07
11	60	28	22·73	·05
12	51	40	52·45	·03
13	61	59	47·13	·03
14	71	29	1·90	·04
15	46	31	13·66	·05
16	48	47	12·49	·05
17	68	33	26·67	·02
18	62	39	24·19	·06

Equations to be satisfied — Factor

$$x_1 + x_2 + x_3 \;\ldots\;\ldots\;\ldots = e_1 = -\,0{\cdot}129, \qquad \lambda_1$$
$$x_4 + x_5 + x_6 \;\ldots\;\ldots\;\ldots = e_2 = -\,0{\cdot}284, \qquad \lambda_2$$
$$x_7 + x_8 + x_9 \;\ldots\;\ldots\;\ldots = e_3 = +\,0{\cdot}046, \qquad \lambda_3$$
$$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots\;\ldots = e_4 = +\,0{\cdot}257, \qquad \lambda_4$$
$$x_{13} + x_{14} + x_{15} \;\ldots\;\ldots\;\ldots = e_5 = -\,0{\cdot}105, \qquad \lambda_5$$
$$x_{16} + x_{17} + x_{18} \;\ldots\;\ldots\;\ldots = e_6 = +\,0{\cdot}089, \qquad \lambda_6$$
$$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = +\,0{\cdot}08, \qquad \lambda_7$$
$$\left.\begin{array}{l} 9x_3 - 22x_2 + 16x_6 - 8x_5 + 5x_9 - 19x_8 \\ +17x_{12} - 12x_{11} + 20x_{15} - 7x_{14} + 10x_{18} - 8x_{17} \end{array}\right\} = e_8 = +35{\cdot}0, \qquad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·129	+0·14	...	...	...	...	...	+0·03	− 1·49
2	− 0·284		+0·22	...	...	...	...	+0·08	+ 0·32
3	+ 0·046			+0·09	...	...	...	+0·03	− 0·42
4	+ 0·257				+0·15	...	...	+0·07	− 0·09
5	− 0·105					+0·12	...	+0·03	+ 0·72
6	+ 0·089			*			+0·13	+0·05	+ 0·44
7	+ 0·08							+0·29	...
8	+35·0								+118·32

Values of the Factors

$\lambda_1 = +\;2{\cdot}9425$
$\lambda_2 = -\;1{\cdot}9347$
$\lambda_3 = +\;2{\cdot}1349$
$\lambda_4 = +\;1{\cdot}7973$
$\lambda_5 = -\;3{\cdot}1625$
$\lambda_6 = -\;0{\cdot}6775$
$\lambda_7 = +\;0{\cdot}2944$
$\lambda_8 = +\;0{\cdot}3690$

Angular errors in seconds

$x_1 = +\,{\cdot}097$	$x_7 = +\,{\cdot}073$	$x_{13} = -\,{\cdot}086$
$x_2 = -\,{\cdot}414$	$x_8 = -\,{\cdot}146$	$x_{14} = -\,{\cdot}230$
$x_3 = +\,{\cdot}188$	$x_9 = +\,{\cdot}119$	$x_{15} = +\,{\cdot}211$
$x_4 = -\,{\cdot}131$	$x_{10} = +\,{\cdot}146$	$x_{16} = -\,{\cdot}019$
$x_5 = -\,{\cdot}391$	$x_{11} = -\,{\cdot}131$	$x_{17} = -\,{\cdot}073$
$x_6 = +\,{\cdot}238$	$x_{12} = +\,{\cdot}242$	$x_{18} = +\,{\cdot}181$

$[wx^2] = 13{\cdot}94$

* In the tables of the equations between the factors the co-efficients of the terms below the diagonal are omitted for convenience, the co-efficient of the *pth* term in the *qth* line being always the same as the co-efficient of the *qth* term in the *pth* line.

Figure No. 56.

Observed Angles

No.	Value			Reciprocal Weight
	°	′	″	
1	52	55	10·79	·03
2	33	20	44·23	·04
3	52	1	14·60	·02
4	41	42	53·89	·05
5	22	13	54·78	·07
6	64	1	59·16	·09
7	56	35	4·19	·07
8	37	9	3·30	·03

Equations to be satisfied

Equations	Factor
$x_1 + x_2 + x_3 + x_4 = e_1 = +0·528,$	λ_1
$x_5 + x_6 + x_7 + x_8 = e_2 = -0·057,$	λ_2
$x_7 + x_8 + x_1 + x_2 = e_3 = +0·866,$	λ_3
$\left.\begin{array}{l} 30x_2 - 2x_3 + 24x_4 \\ -52x_5 - 13x_6 - 27x_7 \end{array}\right\} = e_4 = +11·7,$	λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of			
		λ_1	λ_2	λ_3	λ_4
1	+ 0·528	+0·14	...	+0·07	+ 2·36
2	− 0·057		+0·26	+0·10	− 6·70
3	+ 0·866		*	+0·17	− 0·69
4	+11·7				+320·40

Values of the Factors

$\lambda_1 = + 0·9550$

$\lambda_2 = - 3·6072$

$\lambda_3 = + 6·6963$

$\lambda_4 = - 0·0315$

Angular errors in seconds

$x_1 = + ·229$	$x_5 = - ·138$
$x_2 = + ·268$	$x_6 = - ·288$
$x_3 = + ·021$	$x_7 = + ·276$
$x_4 = + ·010$	$x_8 = + ·093$

$[wx^2] = 6·14$

Figure No. 57.

Observed Angles

No.	Value °	′	″	Reciprocal Weight	No.	Value °	′	″	Reciprocal Weight	No.	Value °	′	″	Reciprocal Weight
1	39	9	9·15	·05	10	73	28	58·34	·02	19	81	46	20·57	·06
2	54	2	53·76	·10	11	55	59	33·57	·04	20	34	26	18·39	·05
3	86	47	57·39	·08	12	50	31	28·43	·06	21	63	47	21·25	·10
4	61	28	2·72	·09	13	49	10	17·63	·07	22	89	43	42·15	·07
5	36	3	28·18	·05	14	87	49	20·22	·07	23	60	35	7·95	·04
6	82	28	29·99	·05	15	43	0	23·05	·03	24	29	41	9·79	·04
7	60	35	20·96	·04	16	76	8	11·00	·04	25	50	9	8·53	·04
8	44	41	40·86	·04	17	72	9	9·91	·02	26	56	8	30·58	·05
9	74	42	57·63	·05	18	31	42	40·47	·10	27	73	42	21·18	·04

Equations to be satisfied								Factor
x_1	$+ x_2$	$+ x_3$	...	...	...	...	$= e_1 = -1{\cdot}086$,	λ_1
x_4	$+ x_5$	$+ x_6$	...	...	...	...	$= e_2 = -0{\cdot}038$,	λ_2
x_7	$+ x_8$	$+ x_9$	...	...	...	...	$= e_3 = -0{\cdot}948$,	λ_3
x_{10}	$+ x_{11}$	$+ x_{12}$	...	...	...	...	$= e_4 = -0{\cdot}003$,	λ_4
x_{13}	$+ x_{14}$	$+ x_{15}$	...	...	...	...	$= e_5 = +0{\cdot}474$,	λ_5
x_{16}	$+ x_{17}$	$+ x_{18}$	...	...	...	...	$= e_6 = -0{\cdot}071$,	λ_6
x_{19}	$+ x_{20}$	$+ x_{21}$	...	...	...	...	$= e_7 = -0{\cdot}111$,	λ_7
x_{22}	$+ x_{23}$	$+ x_{24}$	...	...	...	...	$= e_8 = -0{\cdot}469$,	λ_8
x_{25}	$+ x_{26}$	$+ x_{27}$	...	...	...	...	$= e_9 = -0{\cdot}130$,	λ_9
x_1	$+ x_4$	$+ x_7$	$+ x_{10}$	$+ x_{13}$	$+ x_{16}$	...	$= e_{10} = -0{\cdot}20$,	λ_{10}
x_{12}	$+ x_{14}$	$+ x_{19}$	$+ x_{22}$	$+ x_{25}$		...	$= e_{11} = -0{\cdot}10$,	λ_{11}
$2x_3$	$-15x_2$	$+3x_6$	$-29x_5$	$+6x_9$	$-22x_8$	...	$= e_{12} = +22{\cdot}8$,	λ_{12}
$+18x_{12}$	$-14x_{11}$	$+23x_{15}$	$-x_{14}$	$+34x_{18}$	$-7x_{17}$			
$14x_{11}$	$-6x_{10}$	$+10x_{21}$	$-31x_{20}$	$+37x_{24}$	...	...	$= e_{13} = -33{\cdot}8$,	λ_{13}
$-11x_{23}$	$+6x_{27}$	$-14x_{26}$	$+18x_{13}$	$-23x_{15}$				

Figure No. 57—(Continued).

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}	λ_{11}	λ_{12}	λ_{13}
1	− 1·086	+0·23	...	...	...	...	...	...	...	...	+0·05	...	− 1·34	...
2	− 0·038		+0·19	...	...	...	...	...	...	...	+0·09	...	− 1·30	...
3	− 0·948			+0·13	...	...	...	...	...	...	+0·04	...	− 0·58	...
4	− 0·003				+0·12	...	...	...	...	...	+0·02	+0·06	+ 0·52	+ 0·44
5	+ 0·474					+0·17	...	...	...	...	+0·07	+0·07	+ 0·62	+ 0·57
6	− 0·071						+0·16	...	...	...	+0·04	...	+ 3·26	...
7	− 0·111							+0·21	...	...	...	+0·06	...	− 0·55
8	− 0·469								+0·15	...	...	+0·07	...	+ 1·04
9	− 0·130				*					+0·13	...	+0·04	...	− 0·46
10	− 0·20										+0·31	...	...	+ 1·14
11	− 0·10											+0·30	+ 1·01	...
12	+22·8												+246·28	− 23·71
13	−33·8													+176·00

Values of the Factors

$\lambda_1 = -4{\cdot}8308$
$\lambda_2 = -0{\cdot}6770$
$\lambda_3 = -7{\cdot}6015$
$\lambda_4 = +0{\cdot}5478$
$\lambda_5 = +2{\cdot}8868$
$\lambda_6 = -1{\cdot}6763$
$\lambda_7 = -0{\cdot}9190$
$\lambda_8 = -1{\cdot}4550$
$\lambda_9 = -1{\cdot}5683$
$\lambda_{10} = +1{\cdot}5976$
$\lambda_{11} = -0{\cdot}5218$
$\lambda_{12} = +0{\cdot}0409$
$\lambda_{13} = -0{\cdot}2060$

Angular errors in seconds

$x_1 = -{\cdot}162$	$x_{10} = +{\cdot}068$	$x_{19} = -{\cdot}086$
$x_2 = -{\cdot}544$	$x_{11} = -{\cdot}116$	$x_{20} = +{\cdot}273$
$x_3 = -{\cdot}380$	$x_{12} = +{\cdot}045$	$x_{21} = -{\cdot}298$
$x_4 = +{\cdot}083$	$x_{13} = +{\cdot}054$	$x_{22} = -{\cdot}138$
$x_5 = -{\cdot}093$	$x_{14} = +{\cdot}163$	$x_{23} = +{\cdot}032$
$x_6 = -{\cdot}028$	$x_{15} = +{\cdot}257$	$x_{24} = -{\cdot}363$
$x_7 = -{\cdot}240$	$x_{16} = -{\cdot}003$	$x_{25} = -{\cdot}084$
$x_8 = -{\cdot}340$	$x_{17} = -{\cdot}039$	$x_{26} = +{\cdot}066$
$x_9 = -{\cdot}368$	$x_{18} = -{\cdot}029$	$x_{27} = -{\cdot}112$

$[wx^2] = 22{\cdot}57$

Figure No. 58.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	47	23	30·80	·06
2	22	46	59·06	·12
3	47	22	35·19	·10
4	62	26	55·79	·06
5	29	52	31·18	·06
6	40	17	58·67	·03
7	47	3	6·42	·06
8	62	46	25·55	·05

Equations to be satisfied — **Factor**

$x_1 + x_2 + x_3 + x_4 = e_1 = -0·104,$ λ_1

$x_5 + x_6 + x_7 + x_8 = e_2 = +1·217,$ λ_2

$x_7 + x_8 + x_1 + x_2 = e_3 = +1·230,$ λ_3

$$\left.\begin{array}{l} 42x_2 - 8x_3 + 11x_4 \\ -36x_5 + x_6 - 19x_7 \end{array}\right\} = e_4 = +2·0,$$ λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 0·104	+0·34	...	+0·18	+ 4·90
2	+ 1·217		+0·20	+0·11	− 3·27
3	+ 1·230		*	+0·29	+ 3·90
4	+ 2·0				+324·79

Values of the Factors

$\lambda_1 = -2·8889$

$\lambda_2 = +5·6263$

$\lambda_3 = +2·9453$

$\lambda_4 = +0·0710$

Angular errors in seconds

$x_1 = +·003$	$x_5 = +·184$
$x_2 = +·365$	$x_6 = +·171$
$x_3 = -·346$	$x_7 = +·433$
$x_4 = -·126$	$x_8 = +·429$

$[wx^2] = 10·92$

Figure No. 59.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	48	39	36·41	·09
2	59	48	45·48	·05
3	71	31	37·08	·08
4	56	48	36·38	·03
5	56	56	6·60	·04
6	66	15	16·35	·06
7	38	31	8·07	·04
8	88	39	56·96	·09
9	52	48	56·81	·08
10	31	40	2·31	·05
11	82	48	3·92	·12
12	65	31	52·22	·06
13	42	49	50·19	·05
14	71	57	38·67	·11
15	65	12	30·44	·07
16	70	21	13·83	·09
17	39	57	28·42	·13
18	69	41	20·66	·11
19	71	9	32·52	·05
20	62	21	34·60	·05
21	46	28	53·60	·06

Equations to be satisfied — **Factor**

Equation	Factor
$x_1 \ldots + x_2 \ldots + x_3 \ldots \ldots = e_1 = -1{\cdot}400,$	λ_1
$x_4 \ldots + x_5 \ldots + x_6 \ldots \ldots = e_2 = -1{\cdot}014,$	λ_2
$x_7 \ldots + x_8 \ldots + x_9 \ldots \ldots = e_3 = +1{\cdot}546,$	λ_3
$x_{10} \ldots + x_{11} \ldots + x_{12} \ldots \ldots = e_4 = -1{\cdot}889,$	λ_4
$x_{13} \ldots + x_{14} \ldots + x_{15} \ldots \ldots = e_5 = -1{\cdot}201,$	λ_5
$x_{16} \ldots + x_{17} \ldots + x_{18} \ldots \ldots = e_6 = +2{\cdot}412,$	λ_6
$x_{19} \ldots + x_{20} \ldots + x_{21} \ldots \ldots = e_7 = +0{\cdot}302,$	λ_7
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} + x_{19} = e_8 = -0{\cdot}29,$	λ_8
$\left.\begin{array}{l} 7x_3 - 12x_2 + 10x_6 - 14x_5 + 16x_9 - 0x_8 + 10x_{12} \\ -2x_{11} + 10x_{15} - 7x_{14} + 8x_{18} - 25x_{17} + 20x_{21} - 11x_{20} \end{array}\right\} = e_9 = -26{\cdot}2,$	λ_9

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9
1	− 1·400	+0.22	...	...	...	...	...	...	+0·09	− 0.04
2	− 1·014		+0·13	...	...	...	...	...	+0·03	+ 0.04
3	+ 1.546			+0·21	...	...	...	...	+0·04	+ 1.28
4	− 1·889				+0.23	...	...	...	+0·05	+ 0·36
5	− 1·201					+0·23	...	...	+0·05	− 0·07
6	+ 2·412						+0·33	...	+0·09	− 2·37
7	+ 0·302			*				+0·16	+0·05	+ 0·65
8	− 0·29								+0·40	...
9	−26·2									+182·65

Values of the Factors

$\lambda_1 = -6{\cdot}6083$
$\lambda_2 = -7{\cdot}8930$
$\lambda_3 = +7{\cdot}9261$
$\lambda_4 = -8{\cdot}1607$
$\lambda_5 = -5{\cdot}3746$
$\lambda_6 = +6{\cdot}3712$
$\lambda_7 = +2{\cdot}1616$
$\lambda_8 = +0{\cdot}5493$
$\lambda_9 = -0{\cdot}1097$

Angular errors in seconds

$x_1 = -{\cdot}545$	$x_8 = +{\cdot}713$	$x_{15} = -{\cdot}453$
$x_2 = -{\cdot}265$	$x_9 = +{\cdot}494$	$x_{16} = +{\cdot}623$
$x_3 = -{\cdot}590$	$x_{10} = -{\cdot}381$	$x_{17} = +1{\cdot}185$
$x_4 = -{\cdot}221$	$x_{11} = -{\cdot}953$	$x_{18} = +{\cdot}604$
$x_5 = -{\cdot}254$	$x_{12} = -{\cdot}555$	$x_{19} = +{\cdot}136$
$x_6 = -{\cdot}539$	$x_{13} = -{\cdot}241$	$x_{20} = +{\cdot}168$
$x_7 = +{\cdot}339$	$x_{14} = -{\cdot}507$	$x_{21} = -{\cdot}002$

$[wx^2] = 70{\cdot}11$

Figure No. 60.

Observed Angles

No.	°	′	″	Reciprocal Weight
1	42	9	27·58	·08
2	80	46	20·93	·06
3	57	4	11·91	·16
4	47	4	55·22	·14
5	52	24	53·34	·18
6	80	30	14·37	·09
7	83	12	35·12	·17
8	45	40	44·52	·10
9	51	6	39·83	·06
10	45	35	3·62	·07
11	76	1	41·72	·09
12	58	23	15·09	·08
13	65	54	20·15	·15
14	44	1	42·04	·12
15	70	3	57·29	·14
16	76	3	37·90	·13
17	63	10	37·30	·11
18	40	45	43·59	·08

Equations to be satisfied — Factor

$$x_1 + x_2 + x_3 = e_1 = -0{\cdot}067, \quad \lambda_1$$
$$x_4 + x_5 + x_6 = e_2 = +2{\cdot}428, \quad \lambda_2$$
$$x_7 + x_8 + x_9 = e_3 = -1{\cdot}033, \quad \lambda_3$$
$$x_{10} + x_{11} + x_{12} = e_4 = +0{\cdot}051, \quad \lambda_4$$
$$x_{13} + x_{14} + x_{15} = e_5 = -0{\cdot}928, \quad \lambda_5$$
$$x_{16} + x_{17} + x_{18} = e_6 = -1{\cdot}648, \quad \lambda_6$$
$$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -0{\cdot}41, \quad \lambda_7$$
$$\left.\begin{array}{l} 14x_3 - 3x_2 + 4x_6 - 16x_5 + 17x_9 - 21x_8 \\ +13x_{12} - 5x_{11} + 8x_{15} - 22x_{14} + 25x_{18} - 10x_{17} \end{array}\right\} = e_8 = -28{\cdot}5, \quad \lambda_8$$

Equations between the Factors

No. of e	Value of e	λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·067	+0·30	...	...	...	...	...	+0·08	+ 2·06
2	+ 2·428		+0·41	...	...	...	...	+0·14	− 2·52
3	− 1·033			+0·33	...	...	...	+0·17	− 1·08
4	+ 0·051				+0·24	...	...	+0·07	+ 0·59
5	− 0·928					+0·41	...	+0·15	− 1·52
6	− 1·648		*				+0·32	+0·13	+ 0·90
7	− 0·41							+0·74	...
8	−28·5								+284·67

Values of the Factors

$\lambda_1 = +0{\cdot}0213$
$\lambda_2 = +5{\cdot}2388$
$\lambda_3 = -3{\cdot}7608$
$\lambda_4 = +0{\cdot}1431$
$\lambda_5 = -2{\cdot}8034$
$\lambda_6 = -5{\cdot}2874$
$\lambda_7 = +0{\cdot}8001$
$\lambda_8 = -0{\cdot}0667$

Angular errors in seconds

$x_1 = +\ {\cdot}066$	$x_7 = -\ {\cdot}503$	$x_{13} = -\ {\cdot}301$
$x_2 = +\ {\cdot}013$	$x_8 = -\ {\cdot}236$	$x_{14} = -\ {\cdot}160$
$x_3 = -\ {\cdot}146$	$x_9 = -\ {\cdot}294$	$x_{15} = -\ {\cdot}467$
$x_4 = +\ {\cdot}845$	$x_{10} = +\ {\cdot}066$	$x_{16} = -\ {\cdot}583$
$x_5 = +\ 1{\cdot}135$	$x_{11} = +\ {\cdot}043$	$x_{17} = -\ {\cdot}509$
$x_6 = +\ {\cdot}448$	$x_{12} = -\ {\cdot}058$	$x_{18} = -\ {\cdot}556$

$[wx^2] = 29{\cdot}50$

Figure No. 61.

Observed Angles

No.	°	′	″	Reciprocal Weight
1	41	7	40·22	·07
2	70	54	58·57	·18
3	67	57	21·57	·05
4	67	16	3·53	·09
5	41	3	12·46	·11
6	71	40	42·53	·14
7	76	5	28·28	·30
8	66	14	50·27	·09
9	37	39	43·06	·21
10	36	58	34·84	·11
11	70	15	2·72	·14
12	72	46	23·01	·24
13	73	54	24·55	·14
14	39	57	23·48	·05
15	66	8	12·65	·04
16	64	37	47·55	·09
17	71	28	40·00	·10
18	43	53	33·36	·11

Equations to be satisfied (Factor)

$$x_1 + x_2 + x_3 \;\ldots\;\ldots\;\ldots = e_1 = -0·076, \qquad \lambda_1$$
$$x_4 + x_5 + x_6 \;\ldots\;\ldots\;\ldots = e_2 = -1·911, \qquad \lambda_2$$
$$x_7 + x_8 + x_9 \;\ldots\;\ldots\;\ldots = e_3 = +1·140, \qquad \lambda_3$$
$$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots\;\ldots = e_4 = +0·140, \qquad \lambda_4$$
$$x_{13} + x_{14} + x_{15} \;\ldots\;\ldots\;\ldots = e_5 = +0·205, \qquad \lambda_5$$
$$x_{16} + x_{17} + x_{18} \;\ldots\;\ldots\;\ldots = e_6 = +0·481, \qquad \lambda_6$$
$$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -1·03, \qquad \lambda_7$$
$$\left.\begin{matrix} 8x_3 - 7x_2 + 7x_6 - 24x_5 + 27x_9 - 10x_8 \\ +7x_{12} - 7x_{11} + 9x_{15} - 26x_{14} + 22x_{18} - 7x_{17} \end{matrix}\right\} = e_8 = -29·3, \qquad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·076	+0·30	...	...	...	...	...	+0·07	− 0·86
2	− 1·911		+0·34	...	...	...	...	+0·09	− 1·66
3	+ 1·140			+0·60	...	...	...	+0·30	+ 4·77
4	+ 0·140				+0·49	...	...	+0·11	+ 0·70
5	+ 0·205					+0·23	...	+0·14	− 0·94
6	+ 0·481			*			+0·30	+0·09	+ 1·72
7	− 1·03							+0·80	...
8	−29·3								+358·13

Values of the Factors

$\lambda_1 = +0·0491$
$\lambda_2 = -5·5914$
$\lambda_3 = +5·2625$
$\lambda_4 = +1·3831$
$\lambda_5 = +2·3336$
$\lambda_6 = +3·8064$
$\lambda_7 = -3·6626$
$\lambda_8 = -0·1926$

Angular errors in seconds

$x_1 = -·253$	$x_7 = +·480$	$x_{13} = -·186$
$x_2 = +·252$	$x_8 = +·647$	$x_{14} = +·367$
$x_3 = -·075$	$x_9 = +·013$	$x_{15} = +·024$
$x_4 = -·833$	$x_{10} = -·251$	$x_{16} = +·013$
$x_5 = -·107$	$x_{11} = +·382$	$x_{17} = +·515$
$x_6 = -·971$	$x_{12} = +·009$	$x_{18} = -·047$

$[wx^2] = 28·59$

Figure No. 62.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	40	32	49·72	·08
2	67	50	39·05	·07
3	71	36	30·88	·05
4	62	8	19·71	·03
5	43	52	29·98	·06
6	73	59	10·29	·12
7	66	52	17·34	·07
8	69	32	42·30	·07
9	43	35	0·00	·05
10	52	42	2·67	·07
11	60	39	45·18	·04
12	66	38	11·53	·07
13	69	36	48·01	·06
14	42	28	21·21	·05
15	67	54	51·06	·03
16	68	7	41·34	·04
17	72	41	1·24	·02
18	39	11	17·61	·07

Equations to be satisfied — Factor

$$x_1 + x_2 + x_3 \quad \ldots \quad \ldots \quad \ldots = e_1 = -0{\cdot}739, \qquad \lambda_1$$
$$x_4 + x_5 + x_6 \quad \ldots \quad \ldots \quad \ldots = e_2 = -0{\cdot}392, \qquad \lambda_2$$
$$x_7 + x_8 + x_9 \quad \ldots \quad \ldots \quad \ldots = e_3 = -0{\cdot}740, \qquad \lambda_3$$
$$x_{10} + x_{11} + x_{12} \quad \ldots \quad \ldots \quad \ldots = e_4 = -1{\cdot}044, \qquad \lambda_4$$
$$x_{13} + x_{14} + x_{15} \quad \ldots \quad \ldots \quad \ldots = e_5 = -0{\cdot}066, \qquad \lambda_5$$
$$x_{16} + x_{17} + x_{18} \quad \ldots \quad \ldots \quad \ldots = e_6 = -0{\cdot}187, \qquad \lambda_6$$
$$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -1{\cdot}21, \qquad \lambda_7$$
$$\left.\begin{array}{l} 7x_3 - 9x_2 + 6x_6 - 22x_5 + 23x_9 - 8x_8 \\ +\,9x_{12} - 11x_{11} + 8x_{15} - 23x_{14} + 26x_{18} - 6x_{17} \end{array}\right\} = e_8 = +21{\cdot}3, \qquad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·739	+0·20	...	...	...	...	...	+0·08	− 0·28
2	− 0·392		+0·21	...	...	...	...	+0·03	− 0·60
3	− 0·740			+0·19	...	...	...	+0·07	+ 0·59
4	− 1·044				+0·18	...	...	+0·07	+ 0·19
5	− 0·066					+0·14	...	+0·06	− 0·91
6	− 0·187			*			+0·13	+0·04	+ 1·70
7	− 1·21							+0·35	...
8	+21·3								+159·33

Values of the Factors

$\lambda_1 = -\,3{\cdot}3347$
$\lambda_2 = -\,1{\cdot}2831$
$\lambda_3 = -\,4{\cdot}4109$
$\lambda_4 = -\,5{\cdot}9161$
$\lambda_5 = +\,0{\cdot}8796$
$\lambda_6 = -\,3{\cdot}8928$
$\lambda_7 = -\,0{\cdot}2254$
$\lambda_8 = +\,0{\cdot}1930$

Angular errors in seconds

$x_1 = -\,{\cdot}285$	$x_7 = -\,{\cdot}324$	$x_{13} = +\,{\cdot}039$
$x_2 = -\,{\cdot}355$	$x_8 = -\,{\cdot}417$	$x_{14} = -\,{\cdot}178$
$x_3 = -\,{\cdot}099$	$x_9 = +\,{\cdot}001$	$x_{15} = +\,{\cdot}073$
$x_4 = -\,{\cdot}045$	$x_{10} = -\,{\cdot}430$	$x_{16} = -\,{\cdot}165$
$x_5 = -\,{\cdot}332$	$x_{11} = -\,{\cdot}322$	$x_{17} = -\,{\cdot}101$
$x_6 = -\,{\cdot}015$	$x_{12} = -\,{\cdot}292$	$x_{18} = +\,{\cdot}079$

$[wx^2] = 17{\cdot}47$

Figure No. 63.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	50	51	27·51	·12
2	61	10	59·31	·08
3	67	57	34·39	·07
4	68	20	3·46	·10
5	35	12	55·36	·07
6	76	27	2·59	·07
7	67	58	46·14	·05
8	77	25	45·82	·09
9	34	35	28·12	·09
10	45	14	28·28	·06
11	66	9	32·73	·08
12	68	36	0·60	·05
13	64	49	44·81	·05
14	45	38	51·57	·10
15	69	31	22·96	·08
16	62	45	29·06	·19
17	73	23	58·30	·07
18	43	50	31·48	·09

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots = e_1 = +0·769,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots = e_2 = +1·114,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots \ldots = e_3 = -0·222,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots = e_4 = +1·220,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots = e_5 = -1·033,$	λ_5
$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots = e_6 = -1·547,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -0·74,$	λ_7
$\left.\begin{array}{l} 9x_3 - 11x_2 + 5x_6 - 30x_5 + 30x_9 - 5x_8 \\ +8x_{12} - 9x_{11} + 8x_{15} - 21x_{14} + 22x_{18} - 6x_{17} \end{array}\right\} = e_8 = -42·7,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+ 0·769	+0·27	...	...	...	...	...	+0·12	− 0·25
2	+ 1·114		+0·24	...	...	...	...	+0·10	− 1·75
3	− 0·222			+0·23	...	...	...	+0·05	+ 2·25
4	+ 1·220				+0·19	...	...	+0·06	− 0·32
5	− 1·033					+0·23	...	+0·05	− 1·46
6	− 1·547						+0·35	+0·19	+ 1·56
7	− 0·74							+0·57	...
8	−42·7								+268·33

Values of the Factors

$\lambda_1 = +3·8347$
$\lambda_2 = +4·6926$
$\lambda_3 = +0·9100$
$\lambda_4 = +6·9824$
$\lambda_5 = -4·8108$
$\lambda_6 = -2·4547$
$\lambda_7 = -2·5033$
$\lambda_8 = -0·1361$

Angular errors in seconds

$x_1 = +·160$	$x_7 = -·080$	$x_{13} = -·366$
$x_2 = +·426$	$x_8 = +·143$	$x_{14} = -·195$
$x_3 = +·183$	$x_9 = -·285$	$x_{15} = -·472$
$x_4 = +·219$	$x_{10} = +·269$	$x_{16} = -·942$
$x_5 = +·614$	$x_{11} = +·656$	$x_{17} = -·115$
$x_6 = +·281$	$x_{12} = +·295$	$x_{18} = -·490$

$[wx^2] = 32·91$

Figure No. 64.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	43	24	19·14	·08
2	62	26	51·45	·12
3	74	8	48·69	·07
4	80	20	20·65	·05
5	36	43	4·82	·05
6	62	56	34·56	·06
7	63	58	10·72	·08
8	79	11	11·66	·05
9	36	50	36·61	·06
10	41	53	35·96	·14
11	70	34	26·86	·10
12	67	31	57·38	·10
13	65	10	59·98	·09
14	47	56	5·34	·05
15	66	52	54·32	·05
16	65	12	33·09	·34
17	65	24	0·54	·05
18	49	23	28·34	·07

Equations to be satisfied / **Factor**

Equations to be satisfied	Factor
$x_1 + x_2 + x_3 \quad \ldots \quad \ldots \quad \ldots = e_1 = -1·124,$	λ_1
$x_4 + x_5 + x_6 \quad \ldots \quad \ldots \quad \ldots = e_2 = -0·328,$	λ_2
$x_7 + x_8 + x_9 \quad \ldots \quad \ldots \quad \ldots = e_3 = -1·369,$	λ_3
$x_{10} + x_{11} + x_{12} \quad \ldots \quad \ldots \quad \ldots = e_4 = -0·246,$	λ_4
$x_{13} + x_{14} + x_{15} \quad \ldots \quad \ldots \quad \ldots = e_5 = -0·860,$	λ_5
$x_{16} + x_{17} + x_{18} \quad \ldots \quad \ldots \quad \ldots = e_6 = +1·487,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -0·46,$	λ_7
$\left.\begin{matrix} 6x_3 - 11x_2 + 11x_6 - 28x_5 + 29x_9 - 4x_8 \\ +9x_{12} - 7x_{11} + 9x_{15} - 19x_{14} + 18x_{18} - 9x_{17} \end{matrix}\right\} = e_8 = +26·1,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 1·124	+0·27	...	...	...	...	...	+0·08	− 0·90
2	− 0·328		+0·16	...	...	...	...	+0·05	− 0·74
3	− 1·369			+0·19	...	...	...	+0·08	+ 1·54
4	− 0·246				+0·34	...	...	+0·14	+ 0·20
5	− 0·860					+0·19	...	+0·09	− 0·50
6	+ 1·487			*			+0·46	+0·34	+ 0·81
7	− 0·46							+0·78	...
8	+26·1								+176·59

Values of the Factors

$\lambda_1 = -3·6306$

$\lambda_2 = -1·2930$

$\lambda_3 = -8·7128$

$\lambda_4 = -0·9041$

$\lambda_5 = -4·1508$

$\lambda_6 = +2·7842$

$\lambda_7 = +0·1867$

$\lambda_8 = +0·1763$

Angular errors in seconds

$x_1 = -·276$	$x_7 = -·682$	$x_{13} = -0·357$
$x_2 = -·668$	$x_8 = -·471$	$x_{14} = -0·375$
$x_3 = -·180$	$x_9 = -·216$	$x_{15} = -0·128$
$x_4 = -·055$	$x_{10} = -·100$	$x_{16} = +1·010$
$x_5 = -·312$	$x_{11} = -·214$	$x_{17} = +0·060$
$x_6 = +·039$	$x_{12} = +·068$	$x_{18} = +0·417$

$[wx^2] = 28·88$

Figure No. 65.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	44	17	5·35	·14
2	67	11	49·54	·08
3	68	31	5·58	·05
4	65	28	33·79	·06
5	49	26	59·20	·08
6	65	4	27·18	·16
7	63	48	7·22	·07
8	70	27	58·46	·11
9	45	43	54·03	·08
10	47	6	4·66	·10
11	64	58	26·69	·21
12	67	55	28·93	·07
13	67	15	42·78	·12
14	36	24	3·40	·08
15	76	20	13·79	·04
16	72	4	26·13	·07
17	70	5	31·69	·05
18	37	50	2·64	·05

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots = e_1 = +0{\cdot}050,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots = e_2 = -0{\cdot}284,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots \ldots = e_3 = -0{\cdot}784,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots = e_4 = -0{\cdot}239,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots = e_5 = -0{\cdot}420,$	λ_5
$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots = e_6 = +0{\cdot}083,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -0{\cdot}07,$	λ_7
$\left.\begin{array}{l} 8x_3 - 9x_2 + 10x_6 - 18x_5 + 20x_9 - 7x_8 \\ +9x_{12} - 9x_{11} + 5x_{15} - 29x_{14} + 27x_{18} - 8x_{17} \end{array}\right\} = e_8 = -14{\cdot}5,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+ 0·050	+0·27	...	...	...	...	...	+0·14	− 0·32
2	− 0·284		+0·30	...	...	...	...	+0·06	+ 0·16
3	− 0.784			+0·26	...	...	...	+0·07	+ 0·83
4	− 0·239				+0·38	...	...	+0·10	− 1·26
5	− 0·420					+0·24	...	+0·12	− 2·12
6	+ 0·083			*			+0·17	+0·07	+ 0·95
7	− 0·07							+0·56	...
8	−14·5								+219·60

Values of the Factors

$\lambda_1 = -0{\cdot}6850$
$\lambda_2 = -1{\cdot}1872$
$\lambda_3 = -3{\cdot}1015$
$\lambda_4 = -1{\cdot}3312$
$\lambda_5 = -3{\cdot}3275$
$\lambda_6 = +0{\cdot}4242$
$\lambda_7 = +1{\cdot}4586$
$\lambda_8 = -0{\cdot}0960$

Angular errors in seconds

$x_1 = +{\cdot}108$	$x_7 = -{\cdot}115$	$x_{13} = -{\cdot}224$
$x_2 = +{\cdot}014$	$x_8 = -{\cdot}267$	$x_{14} = -{\cdot}044$
$x_3 = -{\cdot}072$	$x_9 = -{\cdot}402$	$x_{15} = -{\cdot}152$
$x_4 = +{\cdot}016$	$x_{10} = +{\cdot}013$	$x_{16} = +{\cdot}132$
$x_5 = +{\cdot}043$	$x_{11} = -{\cdot}098$	$x_{17} = +{\cdot}059$
$x_6 = -{\cdot}343$	$x_{12} = -{\cdot}154$	$x_{18} = -{\cdot}108$

$[wx^2] = 5{\cdot}77$

Figure No. 66.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	42	19	44·51	·08
2	71	7	49·90	·06
3	66	32	28·22	·09
4	70	4	15·20	·22
5	39	2	45·79	·16
6	70	52	59·52	·06
7	67	40	35·40	·20
8	69	5	13·14	·10
9	43	14	11·82	·14
10	48	48	31·90	·16
11	58	31	36·69	·07
12	72	39	53·51	·07
13	79	39	35·50	·03
14	33	45	31·34	·11
15	66	34	54·05	·06
16	51	27	16·90	·15
17	98	24	57·13	·05
18	30	7	45·06	·08

Equations to be satisfied

Equations to be satisfied	Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots = e_1 = +\,2{\cdot}046,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots = e_2 = -\,0{\cdot}051,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots \ldots = e_3 = -\,0{\cdot}141,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots = e_4 = +\,1{\cdot}603,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots = e_5 = +\,0{\cdot}538,$	λ_5
$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots = e_6 = -\,1{\cdot}244,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -\,0{\cdot}59,$	λ_7
$\left.\begin{matrix} 10x_3 - 7x_2 + 8x_6 - 26x_5 + 22x_9 - 8x_8 \\ +\,7x_{12} - 13x_{11} + 9x_{15} - 32x_{14} + 36x_{18} + 3x_{17} \end{matrix}\right\} = e_8 = -65{\cdot}8,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+ 2·046	+0·23	...	...	...	...	...	+0·08	+ 0·48
2	− 0·051		+0·44	...	...	...	...	+0·22	− 3·68
3	− 0·141			+0·44	...	...	...	+0·20	+ 2·28
4	+ 1·603				+0·30	...	...	+0·16	− 0·42
5	+ 0·538					+0·20	...	+0·03	− 2·98
6	− 1·244			*			+0·28	+0·15	+ 3·03
7	− 0·59							+0·84	...
8	−65·8								+434·99

Values of the Factors

$\lambda_1 = +10{\cdot}4148$

$\lambda_2 = +\,0{\cdot}3596$

$\lambda_3 = +\,2{\cdot}0338$

$\lambda_4 = +\,6{\cdot}9812$

$\lambda_5 = +\,0{\cdot}9699$

$\lambda_6 = -\,0{\cdot}9595$

$\lambda_7 = -\,3{\cdot}4657$

$\lambda_8 = -\,0{\cdot}1503$

Angular errors in seconds

$x_1 = +\ {\cdot}556$	$x_7 = -\ {\cdot}287$	$x_{13} = -\ {\cdot}075$
$x_2 = +\ {\cdot}688$	$x_8 = +\ {\cdot}324$	$x_{14} = +\ {\cdot}636$
$x_3 = +\ {\cdot}802$	$x_9 = -\ {\cdot}178$	$x_{15} = -\ {\cdot}023$
$x_4 = -\ {\cdot}683$	$x_{10} = +\ {\cdot}563$	$x_{16} = -\ {\cdot}664$
$x_5 = +\ {\cdot}683$	$x_{11} = +\ {\cdot}625$	$x_{17} = -\ {\cdot}070$
$x_6 = -\ {\cdot}051$	$x_{12} = +\ {\cdot}415$	$x_{18} = -\ {\cdot}510$

$[wx^2] = 45{\cdot}84$

Figure No. 67.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	85	17	1·40	·03
2	43	2	48·62	·10
3	51	40	10·69	·08
4	62	20	1·74	·03
5	79	54	32·74	·11
6	37	45	27·30	·06
7	41	27	16·91	·04
8	75	53	32·16	·05
9	62	39	12·21	·07
10	43	12	14·85	·07
11	37	22	0·21	·08
12	99	25	44·83	·06
13	52	9	43·62	·11
14	69	20	32·02	·03
15	58	29	44·18	·06
16	75	33	40·91	·06
17	51	4	30·63	·03
18	53	21	48·90	·08

Equations to be satisfied

Equations		Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots$	$= e_1 = +0·463,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots$	$= e_2 = +1·473,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots \ldots$	$= e_3 = +0·877,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots$	$= e_4 = -0·390,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots$	$= e_5 = -0·398,$	λ_5
$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots$	$= e_6 = +0·156,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16}$	$= e_7 = -0·57,$	λ_7
$\left.\begin{array}{l} 17x_3 - 23x_2 + 27x_6 - 4x_5 + 11x_9 - 5x_8 \\ - 3x_{12} - 28x_{11} + 13x_{15} - 8x_{14} + 15x_{18} - 17x_{17} \end{array}\right\}$	$= e_8 = +31·7,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+ 0·463	+0·21	...	...	...	...	...	+0·03	− 0·94
2	+ 1·473		+0·20	...	...	...	...	+0·03	+ 1·18
3	+ 0·877			+0·16	...	...	...	+0·04	+ 0·52
4	− 0·390				+0·21	...	...	+0·07	− 2·42
5	− 0·398					+0·20	...	+0·11	+ 0·54
6	+ 0·156			*			+0·17	+0·06	+ 0·69
7	− 0·57							+0·34	...
8	+31·7								+233·23

Values of the Factors

$\lambda_1 = +3·1681$

$\lambda_2 = +7·3341$

$\lambda_3 = +6·0771$

$\lambda_4 = +0·4969$

$\lambda_5 = -0·2415$

$\lambda_3 = +1·8109$

$\lambda_7 = -3·6619$

$\lambda_8 = +0·0983$

Angular errors in seconds

$x_1 = -·015$	$x_7 = +·097$	$x_{13} = -·429$
$x_2 = +·091$	$x_8 = +·279$	$x_{14} = -·031$
$x_3 = +·387$	$x_9 = +·501$	$x_{15} = +·062$
$x_4 = +·110$	$x_{10} = -·222$	$x_{16} = -·111$
$x_5 = +·764$	$x_{11} = -·180$	$x_{17} = +·004$
$x_6 = +·599$	$x_{12} = +·012$	$x_{18} = +·263$

$[wx^2] = 22·98$

Figure No. 68.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	42	47	56·47	·06
2	73	58	41·77	·05
3	63	13	22·06	·06
4	75	22	8·23	·09
5	34	46	19·82	·08
6	69	51	32·77	·08
7	57	35	16·37	·09
8	78	11	54·24	·04
9	44	12	49·22	·13
10	39	26	35·77	·06
11	73	27	23·49	·05
12	67	6	0·48	·08
13	70	34	40·95	·05
14	41	22	40·41	·09
15	68	2	37·48	·05
16	74	13	22·36	·06
17	66	58	30·63	·09
18	38	48	7·57	·05

Equations to be satisfied — **Factor**

$$x_1 + x_2 + x_3 \;\ldots\;\ldots\;\ldots = e_1 = -0{\cdot}091, \quad \lambda_1$$
$$x_4 + x_5 + x_6 \;\ldots\;\ldots\;\ldots = e_2 = +0{\cdot}456, \quad \lambda_2$$
$$x_7 + x_8 + x_9 \;\ldots\;\ldots\;\ldots = e_3 = -0{\cdot}441, \quad \lambda_3$$
$$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots\;\ldots = e_4 = -0{\cdot}558, \quad \lambda_4$$
$$x_{13} + x_{14} + x_{15} \;\ldots\;\ldots\;\ldots = e_5 = -1{\cdot}488, \quad \lambda_5$$
$$x_{16} + x_{17} + x_{18} \;\ldots\;\ldots\;\ldots = e_6 = +0{\cdot}210, \quad \lambda_6$$
$$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = +0{\cdot}15, \quad \lambda_7$$
$$\left.\begin{array}{l} 11x_3 - 6x_2 + 8x_6 - 30x_5 + 22x_9 - 5x_8 \\ + 9x_{12} - 6x_{11} + 8x_{15} - 24x_{14} + 26x_{18} - 9x_{17} \end{array}\right\} = e_8 = +32{\cdot}9, \quad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·091	+0·17	...	...	...	...	...	+0·06	+ 0·36
2	+ 0·456		+0·25	...	...	...	...	+0·09	− 1·76
3	− 0·441			+0·26	...	...	...	+0·09	+ 2·66
4	− 0·558				+0·19	...	...	+0·06	+ 0·42
5	− 1·488					+0·19	...	+0·05	− 1·76
6	+ 0·210			*			+0·20	+0·06	+ 0·49
7	+ 0·15							+0·41	...
8	+32·9								+254·51

Values of the Factors

$\lambda_1 = -1{\cdot}7517$
$\lambda_2 = +1{\cdot}9169$
$\lambda_3 = -4{\cdot}0711$
$\lambda_4 = -4{\cdot}0710$
$\lambda_5 = -7{\cdot}1668$
$\lambda_3 = -0{\cdot}0782$
$\lambda_7 = +2{\cdot}5767$
$\lambda_8 = +0{\cdot}1450$

Angular errors in seconds

$x_1 = +{\cdot}049$	$x_7 = -{\cdot}134$	$x_{13} = -{\cdot}230$
$x_2 = -{\cdot}131$	$x_8 = -{\cdot}192$	$x_{14} = -{\cdot}958$
$x_3 = -{\cdot}009$	$x_9 = -{\cdot}115$	$x_{15} = -{\cdot}300$
$x_4 = +{\cdot}405$	$x_{10} = -{\cdot}090$	$x_{16} = +{\cdot}150$
$x_5 = -{\cdot}195$	$x_{11} = -{\cdot}247$	$x_{17} = -{\cdot}124$
$x_6 = +{\cdot}246$	$x_{12} = -{\cdot}221$	$x_{18} = +{\cdot}184$

$[wx^2] = 20{\cdot}91$

Figure No. 69.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	49	42	19·43	·12
2	56	58	35·28	·05
3	73	19	4·69	·04
4	74	52	16·01	·07
5	54	41	36·83	·05
6	50	26	8·17	·10
7	59	23	25·70	·09
8	74	3	40·82	·06
9	46	32	53·17	·06
10	40	31	27·08	·11
11	63	17	54·46	·11
12	76	10	39·31	·06
13	85	26	42·62	·08
14	42	12	56·03	·06
15	52	20	21·23	·07
16	50	3	49·51	·08
17	67	34	32·11	·10
18	62	21	38·83	·08

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 \; \ldots \; \ldots \; \ldots = e_1 = -\,0{\cdot}826,$	λ_1
$x_4 + x_5 + x_6 \; \ldots \; \ldots \; \ldots = e_2 = +\,0{\cdot}745,$	λ_2
$x_7 + x_8 + x_9 \; \ldots \; \ldots \; \ldots = e_3 = -\,0{\cdot}641,$	λ_3
$x_{10} + x_{11} + x_{12} \; \ldots \; \ldots \; \ldots = e_4 = +\,0{\cdot}546,$	λ_4
$x_{13} + x_{14} + x_{15} \; \ldots \; \ldots \; \ldots = e_5 = -\,0{\cdot}484,$	λ_5
$x_{16} + x_{17} + x_{18} \; \ldots \; \ldots \; \ldots = e_6 = +\,0{\cdot}202,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = +\,0{\cdot}35,$	λ_7
$\left.\begin{array}{l} 7x_3 - 14x_2 + 18x_6 - 15x_5 + 20x_9 - 6x_8 \\ +5x_{12} - 10x_{11} + 16x_{15} - 24x_{14} + 11x_{18} - 9x_{17} \end{array}\right\} = e_8 = +53{\cdot}0,$	λ_8

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·826	+0·21	…	…	…	…	…	+0·12	− 0·42
2	+ 0·745		+0·22	…	…	…	…	+0·07	+ 1·05
3	− 0·641			+0·21	…	…	…	+0·09	+ 0·84
4	+ 0·546				+0·28	…	…	+0·11	− 0·80
5	− 0·484					+0·21	…	+0·08	− 0·32
6	+ 0·202						+0·26	+0·08	− 0·02
7	+ 0·35							+0·55	…
8	+53·0								+164·33

Values of the Factors

$\lambda_1 = -\,4{\cdot}6295$

$\lambda_2 = +\,1{\cdot}0216$

$\lambda_3 = -\,5{\cdot}4219$

$\lambda_4 = +\,1{\cdot}9692$

$\lambda_5 = -\,2{\cdot}7050$

$\lambda_6 = +\,0{\cdot}0662$

$\lambda_7 = +\,2{\cdot}3940$

$\lambda_8 = +\,0{\cdot}3359$

Angular errors in seconds

$x_1 = -\,{\cdot}268$	$x_7 = -\,{\cdot}273$	$x_{13} = -\,{\cdot}025$
$x_2 = -\,{\cdot}467$	$x_8 = -\,{\cdot}446$	$x_{14} = -\,{\cdot}646$
$x_3 = -\,{\cdot}091$	$x_9 = +\,{\cdot}078$	$x_{15} = +\,{\cdot}187$
$x_4 = +\,{\cdot}239$	$x_{10} = +\,{\cdot}480$	$x_{16} = +\,{\cdot}197$
$x_5 = -\,{\cdot}201$	$x_{11} = -\,{\cdot}153$	$x_{17} = -\,{\cdot}296$
$x_6 = +\,{\cdot}707$	$x_{12} = +\,{\cdot}219$	$x_{18} = +\,{\cdot}301$

$[wx^2] = 29{\cdot}10$

Figure No. 70.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	23	45	12·02	·04
2	52	38	17·54	·05
3	36	53	8·68	·05
4	66	43	21·84	·03
5	53	20	16·97	·09
6	23	3	12·57	·06
7	65	29	40·11	·04
8	38	6	51·32	·03

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 + x_4 = e_1 = -0·440,$	λ_1
$x_5 + x_6 + x_7 + x_8 = e_2 = +0·274,$	λ_2
$x_7 + x_8 + x_1 + x_2 = e_3 = +0·077,$	λ_3
$\left.\begin{array}{l} 16\,x_2 - 0\,x_3 + 9\,x_4 \\ -15\,x_5 + 0\,x_6 - 9\,x_7 \end{array}\right\} = e_4 = +4·5,$	λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 0·440	+0·17	...	+0·09	+ 1·07
2	+ 0·274		+0·22	+0·07	− 1·71
3	+ 0·077			+0·16	+ 0·44
4	+ 4·5				+ 38·72

Values of the Factors

$\lambda_1 = -5·8131$

$\lambda_2 = +5·0756$

$\lambda_3 = +0·1577$

$\lambda_4 = +0·4992$

Angular errors in seconds.

$x_1 = -·226$	$x_5 = -·217$
$x_2 = +·116$	$x_6 = +·304$
$x_3 = -·290$	$x_7 = +·030$
$x_4 = -·040$	$x_8 = +·157$

$[wx^2] = 6·19$

Figure No. 71.

Observed Angles

No.	Value	Reciprocal Weight
	° ′ ″	
1	43 35 22·42	·04
2	68 52 0·35	·05
3	35 59 11·39	·04
4	31 33 26·89	·11
5	77 59 24·84	·08
6	34 27 57·49	·04
7	26 57 59·01	·04
8	40 34 39·43	·06

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 + x_4 = e_1 = +0·387,$	λ_1
$x_5 + x_6 + x_7 + x_8 = e_2 = -0·517,$	λ_2
$x_7 + x_8 + x_1 + x_2 = e_3 = +0·144,$	λ_3
$\left.\begin{matrix} 14x_2 + 6x_3 + 34x_4 \\ -4x_5 + 11x_6 - 30x_7 \end{matrix}\right\} = e_4 = +22·1,$	λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	+ 0·387	+0·24	...	+0·09	+ 4·68
2	− 0·517	•	+0·22	+0·10	− 1·08
3	+ 0·144		*	+0·19	− 0·50
4	+22·1				+180·52

Values of the Factors

$\lambda_1 = -6·3630$

$\lambda_2 = -3·9676$

$\lambda_3 = +6·6037$

$\lambda_4 = +0·2819$

Angular errors in seconds

$x_1 = +·010$	$x_5 = -·408$
$x_2 = +·209$	$x_6 = -·034$
$x_3 = -·186$	$x_7 = -·233$
$x_4 = +·354$	$x_8 = +·158$

$[wx^2] = 6·76$

June, 1883.

W. H. COLE,
In charge of Computing Office.

CEYLON BRANCH SERIES OF THE SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. REDUCTION OF FIGURES.

Figure No. 82.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	50	14	0·04	·05
2	40	30	14·14	·07
3	46	46	44·99	·05
4	42	29	0·89	·05
5	44	28	19·83	·10
6	46	15	53·01	·08
7	38	38	10·94	·06
8	50	37	34·80	·05

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 + x_4 = e_1 = -0·129,$	λ_1
$x_3 + x_4 + x_5 + x_6 = e_2 = -1·497,$	λ_2
$x_5 + x_6 + x_7 + x_8 = e_3 = -1·618,$	λ_3
$\left.\begin{array}{l} -17x_1 + x_2 - 19x_3 \\ +18x_6 - 2x_7 + 17x_8 \end{array}\right\} = e_4 = -23·4,$	λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 0·129	+0·22	+0·10	...	− 1·73
2	− 1·497		+0·28	+0·18	+ 0·49
3	− 1·618		*	+0·29	+ 2·17
4	−23·4				+73·18

Values of the Factors

$\lambda_1 = -1·1841$

$\lambda_2 = -3·7017$

$\lambda_3 = -1·1121$

$\lambda_4 = -0·2900$

Angular errors in seconds

$x_1 = +·187$	$x_5 = -·481$
$x_2 = -·103$	$x_6 = -·803$
$x_3 = +·031$	$x_7 = -·032$
$x_4 = -·244$	$x_8 = -·302$

$[wx^2] = 14·28$

* *Vide* foot note on page 90—F.

Figure No. 83.

Observed Angles

No.	Value	Reciprocal Weight
	° ′ ″	
1	35 28 50·37	·11
2	36 33 11·34	·08
3	54 29 40·39	·10
4	53 28 18·00	·08
5	27 28 1·59	·09
6	44 33 59·45	·07
7	70 18 20·44	·11
8	37 39 38·82	·06

Equations to be satisfied

					Factor
x_1	$+x_2$	$+x_3$	$+x_4$	$= e_1 = -0·204,$	λ_1
x_3	$+x_4$	$+x_5$	$+x_6$	$= e_2 = -0·821,$	λ_2
x_5	$+x_6$	$+x_7$	$+x_8$	$= e_3 = +0·098,$	λ_3
	$-30x_1$ $+31x_6$	$+0x_2$ $+10x_7$	$-15x_3$ $+27x_8$	$= e_4 = +13·5,$	λ_4

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 0·204	+0·37	+0·18	...	− 4·80
2	− 0·821		+0·34	+0·16	+ 0·67
3	+ 0·098		*	+0·33	+ 4·89
4	+13·5				+243·51

Values of the Factors

$\lambda_1 = +3·2769$

$\lambda_2 = -4·8156$

$\lambda_3 = +0·9349$

$\lambda_4 = +0·1145$

Angular errors in seconds

$x_1 = -·017$	$x_5 = -·349$
$x_2 = +·262$	$x_6 = -·023$
$x_3 = -·326$	$x_7 = +·229$
$x_4 = -·123$	$x_8 = +·241$

$[wx^2] = 4·92$

Figure No. 84.

Observed Angles

No.	°	′	″	Reciprocal Weight
1	24	53	1·85	·05
2	25	22	1·49	·05
3	82	55	9·42	·07
4	46	49	47·45	·10
5	21	37	26·83	·09
6	28	37	36·60	·04
7	63	11	27·11	·06
8	66	33	29·78	·10

Equations to be satisfied — Factor

$x_1 + x_2 + x_3 + x_4 = e_1 = -0·067,\quad \lambda_1$

$x_3 + x_4 + x_5 + x_6 = e_2 = -0·024,\quad \lambda_2$

$x_5 + x_6 + x_7 + x_8 = e_3 = +0·030,\quad \lambda_3$

$\left.\begin{array}{lll} -46\,x_1 & -7\,x_2 & -10\,x_3 \\ +39\,x_6 & +\ x_7 & +\ 9\,x_8 \end{array}\right\} = e_4 = +17·9,\quad \lambda_4$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 0·067	+0·27	+0·17	...	− 3·35
2	− 0·024		+0·30	+0·13	+ 0·86
3	+ 0·030		*	+0·29	+ 2·52
4	+17·9				+184·25

Values of the Factors

$\lambda_1 = +3·4060$

$\lambda_2 = -2·3547$

$\lambda_3 = -0·3620$

$\lambda_4 = +0·1750$

Angular errors in seconds

$x_1 = -·232$	$x_5 = -·244$
$x_2 = +·109$	$x_6 = +·164$
$x_3 = -·049$	$x_7 = -·011$
$x_4 = +·105$	$x_8 = +·121$

$[wx^2] = 2·94$

Figure No. 85.

Observed Angles

No.	Value	Reciprocal Weight
	° ′ ″	
1	29 57 8·66	·07
2	31 16 20·71	·07
3	49 12 59·27	·06
4	69 33 29·72	·05
5	18 57 22·57	·10
6	42 16 6·96	·07
7	96 53 43·96	·17
8	21 52 45·98	·07

Equations to be satisfied — Factor

$$x_1 + x_2 + x_3 + x_4 = e_1 = -1{\cdot}856, \qquad \lambda_1$$

$$x_3 + x_4 + x_5 + x_6 = e_2 = -1{\cdot}611, \qquad \lambda_2$$

$$x_5 + x_6 + x_7 + x_8 = e_3 = -0{\cdot}614, \qquad \lambda_3$$

$$\left.\begin{array}{lll} -37\,x_1 & +\ 4\,x_2 & -15\,x_3 \\ +47\,x_6 & +24\,x_7 & +52\,x_8 \end{array}\right\} = e_4 = +39{\cdot}5, \qquad \lambda_4$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 1·856	+0·25	+0·11	...	− 3·21
2	− 1·611		+0·28	+0·17	+ 2·39
3	− 0·614		*	+0·41	+ 11·01
4	+39·5				+552·28

Values of the Factors

$\lambda_1 = -4{\cdot}4464$

$\lambda_2 = -2{\cdot}6884$

$\lambda_3 = -4{\cdot}1363$

$\lambda_4 = +0{\cdot}1398$

Angular errors in seconds

$x_1 = -{\cdot}673$	$x_5 = -{\cdot}682$
$x_2 = -{\cdot}272$	$x_6 = -{\cdot}018$
$x_3 = -{\cdot}554$	$x_7 = -{\cdot}133$
$x_4 = -{\cdot}357$	$x_8 = +{\cdot}219$

$[wx^2] = 20{\cdot}64$

Figure No. 86.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	17	6	43·57	·06
2	42	57	42·99	·08
3	119	55	32·07	·12
4	82	21	20·72	·05
5	16	16	44·86	·05
6	81	21	54·38	·15
7	110	49	40·52	·11
8	61	45	48·39	·06
9	7	24	30·39	·07
10	92	3	42·13	·06
11	78	34	2·12	·08
12	9	22	16·03	·23
13	55	4	33·05	·05
14	5	30	0·62	·20
15	119	25	25·22	·30
16	2	33	59·53	·03
17	146	43	17·39	·18
18	180	9	11·30	·74
19	27	46	30·85	·09
20	2	47	0·12	·18
21	75	26	18·88	·20
22	74	0	10·21	·25
23	2	53	46·34	·24
24	27	39	44·84	·10

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots = e_1 = -1·595,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots = e_2 = -0·209,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots \ldots = e_3 = -0·833,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots = e_4 = -0·011,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots = e_5 = -1·265,$	λ_5
$x_{19} + x_{20} + x_{21} + x_{22} \ldots \ldots = e_6 = -0·580,$	λ_6
$x_{21} + x_{22} + x_{23} + x_{24} \ldots \ldots = e_7 = -0·374,$	λ_7
$x_{16} + x_{17} + x_{18} + x_{23} + x_{24} \ldots = e_8 = -0·748,$	λ_8
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_9 = -0·48,$	λ_9
$\left.\begin{array}{l} -14x_3 - 27x_2 + 4x_6 - 84x_5 + 190x_9 \\ -14x_8 + 149x_{12} - 5x_{11} - 14x_{15} - 255x_{14} \\ + 5x_{16} - 0x_{17} - 0x_{18} - 4x_{19} + 43x_{20} \\ - x_{21} + x_{22} - 41x_{23} + 4x_{24} \ldots \end{array}\right\} = e_{10} = +159·3,$	λ_{10}

Equations between the Factors

No. of e	Value of e	λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8	λ_9	λ_{10}
1	− 1·595	+0·26	...	...	...	...	...	...	...	+0·06	− 3·84
2	− 0·209		+0·25	...	...	...	...	...	...	+0·05	− 3·60
3	− 0·833			+0·24	...	...	...	...	...	+0·11	+ 12·46
4	− 0·011				+0·37	...	...	...	...	+0·06	+ 33·87
5	− 1·265					+0·55	...	...	...	+0·05	− 55·20
6	− 0·580						+0·72	+0·45	...	...	+ 7·43
7	− 0·374							+0·79	+0·34	...	− 9·39
8	− 0·748								+1·29	+0·03	− 9·29
9	− 0·48									+0·36	+ 0·15
10	+ 159·3										+ 21888·33

Values of the Factors

λ_1	= − 6·4596
λ_2	= − 1·1092
λ_3	= − 4·5450
λ_4	= − 0·7962
λ_5	= − 1·9289
λ_6	= − 1·2486
λ_7	= + 0·6218
λ_8	= − 0·7463
λ_9	= + 1·7459
λ_{10}	= + 0·0053

Angular errors in seconds

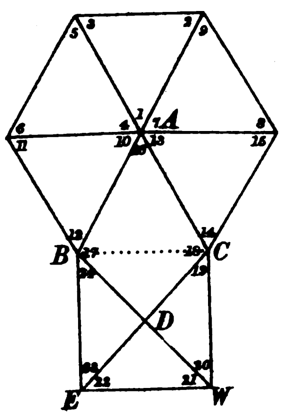
x_1	= − ·283	x_9	= − ·248	x_{17}	= − ·135
x_2	= − ·528	x_{10}	= + ·057	x_{18}	= − ·552
x_3	= − ·784	x_{11}	= − ·066	x_{19}	= − ·114
x_4	= + ·032	x_{12}	= − ·002	x_{20}	= − ·184
x_5	= − ·078	x_{13}	= − ·009	x_{21}	= − ·127
x_6	= − ·163	x_{14}	= − ·655	x_{22}	= − ·155
x_7	= − ·308	x_{15}	= − ·601	x_{23}	= − ·082
x_8	= − ·277	x_{16}	= + ·031	x_{24}	= − ·010

$[wx^2] = 17·82$

NOTE.—For an explanation of some peculiarities in the reduction of this Figure see the next page.

The reduction of Figure No. 86 needs some explanation. This figure forms the connecting link between the Indian and Ceylon triangulation. To construct this link, two stations had to be placed on a small island named Kachi Tívu (Bitter Island) in Palk's Straits at a distance of only ⅜th of a mile apart, and the line joining them formed the side of continuation of a hexagon extending from the South East Coast Series, and the base of a quadrilateral uniting the triangulation with that of Ceylon. When the reduction of these figures was taken in hand it was found that the triangular errors on either side of the short ray connecting the stations on Kachi Tívu Island, were unduly large and of opposite sign, leading to the supposition that there might have been some slight displacement of one of the signals during observation, a displacement of one inch at right angles to the line of sight at so short a distance would have been equivalent to about 4½ seconds in angular measurement; and as high scaffolds were employed both for signals as well as instruments, causing the drops for the plumb-lines to be considerable, while the sites were exposed to strong winds, a slight deviation might not be impossible. This supposed error of centering had no perceptible effect on the other rays; and it was ultimately decided to throw out the short ray on Kachi Tívu Island and form the hexagon and quadrilateral into one compound figure. The number of equations of conditions, which were originally 8 for the hexagon and 4 for the quadrilateral, became reduced to 10 for the compound figure, 7 of which were triangular, 1 quadrangular, 1 central and 1 side.

The 9 angular equations are of the usual kind and need no remark; but the side equation took a somewhat complex form in construction and requires to be explained.



The figure in the margin sufficiently represents the case; but it is designedly drawn out of proportion.

B and *C* represent the two stations on Kachi Tívu Island, *A* the centre of the hexagon on the Indian side and *D* an imaginary point where the diagonals of the quadrilateral on the Ceylon side of the small island cut one another. Now the side ratio $\frac{AB}{AC}$ can be expressed in terms of the angles of the hexagon and the side ratio $\frac{DC}{DB}$ can be expressed in terms of the angles of the quadrilateral. Denoting the former ratio by r_1 and the latter by r_2, we have

$$r_1 = \frac{\sin 11}{\sin 12} \cdot \frac{\sin 5}{\sin 6} \cdot \frac{\sin 2}{\sin 3} \cdot \frac{\sin 8}{\sin 9} \cdot \frac{\sin 14}{\sin 15}.$$

and

$$r_2 = \frac{\sin 20}{\sin 19} \cdot \frac{\sin 22}{\sin 21} \cdot \frac{\sin 24}{\sin 23}.$$

also from the quadrilateral *ABCD* we have

$$-r_1 \sin 17 + \sin (16 + 17) - r_1 r_2 \sin (16 + 18) + r_2 \sin 18 = e_{10}.$$

Differentiating and putting

$$a \text{ for } \frac{r_1 \sin 17}{M}; \qquad b \text{ for } \frac{\sin (16+17)}{M};$$

$$c \;\;,, \;\; \frac{r_1 r_2 \sin (16+18)}{M}; \qquad d \;\;,, \;\; \frac{r_2 \sin 18}{M},$$

and β for the tabular difference of log sine for 1″, *M* being the modulus of common logs, and collecting the coefficients of the errors, the equation becomes

$$\begin{aligned}&(a+c)\,\beta_3 x_3 - (a+c)\,\beta_2 x_2 + (a+c)\,\beta_6 x_6 - (a+c)\,\beta_5 x_5 + (a+c)\,\beta_9 x_9 - (a+c)\,\beta_8 x_8 \\ &+ (a+c)\beta_{12} x_{12} - (a+c)\,\beta_{11} x_{11} + (a+c)\,\beta_{15} x_{15} - (a+c)\,\beta_{14} x_{14} + (b\beta_{16+17} - c\beta_{16+18})\,x_{16} \\ &+ (b\beta_{16+17} - a\beta_{17})\,x_{17} - (c\beta_{16+18} - d\beta_{18})\,x_{18} + (c-d)\,\beta_{19} x_{19} - (c-d)\,\beta_{20} x_{20} + (c-d)\,\beta_{21} x_{21} \\ &- (c-d)\,\beta_{22} x_{22} + (c-d)\,\beta_{23} x_{23} - (c-d)\,\beta_{24} x_{24} = e_{10}.\end{aligned}$$

November, 1883.

W. H. COLE,

In charge of Computing Office.

NOTE.—The triangular errors were, of *ABC* − 6″·33 and of *BCE* + 5″·58: hence I suspected that the signal at *B* or *C* was not in the normal of the mark, the distance between them being only as stated ⅜ mile, and accordingly I treated the figure as above indicated. The result shows the displacement of signal to have occurred at *B*, for at *C* the observed values when compared with the computed are found to have these errors; *ACB* = − 4″·93 and *DCB* = + 3″·60.

J. B. N. HENNESSEY.

SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. TRIANGLES.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
238		XXXIV (Mávandúr)	1·037	− ·188	− ·057		− ·245	68 57 16·988	5·1412892,3	138448·80	26·221
		XXXIX (Avirimodu)	1·036	+ ·414	+ ·117		+ ·531	43 51 15·315	5·0118938,3	102776·50	19·465
		I (Pŏnnúr)	1·036	− ·097	− ·060		− ·157	67 11 27·697	5·1359072,7	136743·68	25·898
			3·109				+ ·129	180 0 0·000			
239		XXXIX (Avirimodu)	1·087	− ·181	+ ·063		− ·118	62 39 22·985	5·1209849,5	132124·98	25·024
		I (Pŏnnúr)	1·087	+ ·019	− ·113		− ·094	48 47 11·309	5·0488086,3	111894·47	21·192
		IV (Pĕrumukkal)	1·087	+ ·073	+ ·050		+ ·123	68 33 25·706	5·1412892,3	138448·80	26·221
			3·261				− ·089	180 0 0·000			
240		I (Pŏnnúr)	·932	+ ·086	− ·054		+ ·032	61 59 46·230	5·0899894,0	123023·88	23·300
		IV (Pĕrumukkal)	·931	− ·211	+ ·109		− ·102	46 31 12·627	5·0047771,0	101106·04	19·149
		V (Gingee)	·932	+ ·230	− ·055		+ ·175	71 29 1·143	5·1209849,5	132124·98	25·024
			2·795				+ ·105	180 0 0·000			
	491	XXXIV (Mávandúr)	·825	+ ·391		− ·041	+ ·350	68 41 56·305	5·0777967,0	119618·04	22·655
		I (Pŏnnúr)	·825	+ ·131		+ ·075	+ ·206	58 7 20·341	5·0375262,0	109025·03	20·649
		II (Kaniyanúr)	·824	− ·238		− ·034	− ·272	53 10 43·354	5·0118938,3	102776·50	19·465
			2·474				+ ·284	180 0 0·000			
	492	II (Kaniyanúr)	·714	+ ·146		− ·042	+ ·104	47 44 35·280	4·9598288,7	91165·16	17·266
		I (Pŏnnúr)	·715	− ·073		+ ·077	+ ·004	56 3 22·799	5·0093783,6	102182·93	19·353
		III (Narasingapuram)	·715	− ·119		− ·035	− ·154	76 12 1·921	5·0777967,0	119618·04	22·655
			2·144				− ·046	180 0 0·000			

Note.—1. The values of the sides are given in the same lines with the opposite angles.
2. Stations XXXIV (Mávandúr) and XXXIX (Avirimodu) appertain to the Madras Longitudinal Series.

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			″	″	″	″	″	° ′ ″			
	493	I (Pŏnnúr)	·675	− ·146		+ ·075	− ·071	67 50 46·354	5·0318900,0	107619·26	20·382
		III (Narasingapuram)	·674	+ ·131		− ·041	+ ·090	60 28 22·146	5·0047771,0	101106·04	19·149
		V (Gingee)	·674	− ·242		− ·034	− ·276	51 40 51·500	4·9598288,7	91165·16	17·266
			2·023				− ·257	180 0 0·000			
241		V (Gingee)	·994	− ·289	− ·055		− ·344	85 21 57·492	5·1866803,8	153702·30	29·110
		IV (Pĕrumukkal)	·994	− ·010	+ ·111		+ ·101	41 42 52·997	5·0111996,7	102612·36	19·434
		VII (Mallipat)	·994	− ·229	− ·056		− ·285	52 55 9·511	5·0899894,0	123023·88	23·300
			2·982				− ·528	180 0 0·000			
242		IV (Pĕrumukkal)	·495	+ ·138	+ ·057		+ ·195	22 13 54·480	4·8297847,7	67574·80	12·798
		VII (Mallipat)	·496	− ·093	− ·104		− ·197	37 9 2·607	5·0328607,7	107860·09	20·428
		VI (Kallapat)	·496	+ ·012	+ ·047		+ ·059	120 37 2·913	5·1866803,8	153702·30	29·110
			1·487				+ ·057	180 0 0·000			
	494	V (Gingee)	·548	− ·268		+ ·068	− ·200	33 20 43·482	4·8297847,7	67574·80	12·798
		VII (Mallipat)	·548	− ·322		− ·160	− ·482	90 4 13·060	5·0896705,3	122933·58	23·283
		VI (Kallapat)	·548	− ·276		+ ·092	− ·184	56 35 3·458	5·0111996,7	102612·36	19·434
			1·644				− ·866	180 0 0·000			
243		VII (Mallipat)	·462	+ ·380	− ·051		+ ·329	86 47 57·257	5·0288119,2	106859·19	20·238
		VI (Kallapat)	·462	+ ·544	+ ·102		+ ·646	54 2 53·944	4·9377134,1	86639·00	16·409
		VIII (Chĕndamangalam)	·462	+ ·162	− ·051		+ ·111	39 9 8·799	4·8297847,7	67574·80	12·798
			1·386				+ 1·086	180 0 0·000			
244		VI (Kallapat)	·483	+ ·029	+ ·049		+ ·078	31 42 40·065	4·7709171,8	59008·85	11·176
		VIII (Chĕndamangalam)	·484	+ ·003	− ·095		− ·092	76 8 10·424	5·0373916,7	108991·25	20·642
		X (Vallam)	·484	+ ·039	+ ·046		+ ·085	72 9 9·511	5·0288119,2	106859·19	20·238
			1·451				+ ·071	180 0 0·000			
245		VIII (Chĕndamangalam)	·142	− ·054	− ·050		− ·104	49 10 17·384	4·6501374,8	44682·50	8·463
		X (Vallam)	·142	− ·257	+ ·096		− ·161	43 0 22·747	4·6050657,1	40277·80	7·628
		XII (Koilánkuppam)	·142	− ·163	− ·046		− ·209	87 49 19·869	4·7709171,8	59008·85	11·176
			·426				− ·474	180 0 0·000			
246		X (Vallam)	·140	+ ·112	+ ·045		+ ·157	73 42 21·197	4·7130365,1	51645·98	9·781
		XII (Koilánkuppam)	·140	+ ·084	− ·093		− ·009	50 9 8·381	4·6160604,8	41310·50	7·824
		XIII (Seppalánattam)	·140	− ·066	+ ·048		− ·018	56 8 30·422	4·6501374,8	44682·50	8·463
			·420				+ ·130	180 0 0·000			
247		XII (Koilánkuppam)	·120	+ ·138	− ·048		+ ·090	89 43 42·120	4·7729688,8	59288·28	11·229
		XIII (Seppalánattam)	·119	+ ·363	+ ·093		+ ·456	29 41 10·127	4·4677970,5	29362·77	5·561
		XIV (Kánádakŏndán)	·120	− ·032	− ·045		− ·077	60 35 7·753	4·7130365,1	51645·98	9·781
			·359				+ ·469	180 0 0·000			
	495	VII (Mallipat)	·309	+ ·093		+ ·054	+ ·147	36 3 28·018	4·7112907,8	51438·80	9·742
		VIII (Chĕndamangalam)	·309	− ·083		+ ·066	− ·017	61 28 2·394	4·8852339,0	76777·49	14·541
		IX (Kiliyúr)	·310	+ ·028		− ·120	− ·092	82 28 29·588	4·9377134,1	86639·00	16·409
			·928				+ ·038	180 0 0·000			
	496	IX (Kiliyúr)	·132	+ ·340		+ ·031	+ ·371	44 41 41·099	4·5740883,4	37504·93	7·103
		VIII (Chĕndamangalam)	·133	+ ·240		+ ·085	+ ·325	60 35 21·152	4·6670081,1	46452·39	8·798
		XI (Ulundúrpet)	·133	+ ·368		− ·116	+ ·252	74 42 57·749	4·7112907,8	51438·80	9·742
			·398				+ ·948	180 0 0·000			
	497	VIII (Chĕndamangalam)	·115	− ·068		+ ·045	− ·023	73 28 58·202	4·6682275,3	46583·00	8·823
		XI (Ulundúrpet)	·114	+ ·116		− ·071	+ ·045	55 59 33·501	4·6050657,1	40277·80	7·628
		XII (Koilánkuppam)	·114	− ·045		+ ·026	− ·019	50 31 28·297	4·5740883,4	37504·93	7·103
			·343				+ ·003	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			″	″	″	″	″	° ′ ″			
	498	XI (Ulundúrpet)	·107	− ·273		− ·056	− ·329	34 26 17·954	4·4677970,5	29362·77	5·561
		XII (Koilánkuppam)	·107	+ ·086		+ ·161	+ ·247	81 46 20·710	4·7108569,0	51387·43	9·732
		XIV (Kánádakŏndán)	·107	+ ·298		− ·105	+ ·193	63 47 21·336	4·6682275,3	46583·00	8·823
			·321				+ ·111	180 0 0·000			
248		XIV (Kánádakŏndán)	·315	− ·019	− ·068		− ·087	70 9 33·848	4·8795147,5	75773·04	14·351
		XIII (Seppalánattam)	·315	+ ·126	+ ·123		+ ·249	62 26 55·724	4·8538177,7	71419·66	13·526
		XVI (Ayyampet)	·314	− ·003	− ·055		− ·058	47 23 30·428	4·7729688,8	59288·28	11·229
			·944				+ ·104	180 0 0·000			
249		XIII (Seppalánattam)	·201	− ·184	+ ·045		− ·139	29 52 30·840	4·5773068,4	37783·91	7·156
		XVI (Ayyampet)	·201	− ·429	− ·110		− ·539	62 46 24·810	4·8289811,1	67449·86	12·775
		XV (Pŏdaiyúr)	·201	− ·604	+ ·065		− ·539	87 21 4·350	4·8795147,5	75773·04	14·351
			·603				−1·217	180 0 0·000			
	499	XIV (Kánádakŏndán)	·200	− ·365		+ ·044	− ·321	22 46 58·539	4·5773068,4	37783·91	7·156
		XVI (Ayyampet)	·200	− ·432		− ·165	− ·597	110 9 55·553	4·9618530,0	91591·04	17·347
		XV (Pŏdaiyúr)	·200	− ·433		+ ·121	− ·312	47 3 5·908	4·8538177,7	71419·66	13·526
			·600				−1·230	180 0 0·000			
250		XVI (Ayyampet)	·124	+ ·590	− ·085		+ ·505	71 31 37·461	4·6788044,9	47731·44	9·040
		XV (Pŏdaiyúr)	·123	+ ·265	+ ·145		+ ·410	59 48 45·767	4·6384871,9	43499·79	8·239
		XVII (Salpai)	·123	+ ·545	− ·060		+ ·485	48 39 36·772	4·5773068,4	37783·91	7·156
			·370				+1·400	180 0 0·000			
251		XV (Pŏdaiyúr)	·139	+ ·002	+ ·056		+ ·058	46 28 53·519	4·5918607,1	39071·56	7·400
		XVII (Salpai)	·140	− ·136	− ·141		− ·277	71 9 32·103	4·7075143,4	50993·44	9·658
		XVIII (Kuchúr)	·139	− ·168	+ ·085		− ·083	62 21 34·378	4·6788044,9	47731·44	9·040
			·418				− ·302	180 0 0·000			
252		XVIII (Kuchúr)	·166	− ·604	+ ·060		− ·544	69 41 19·950	4·7562971,8	57055·46	10·806
		XVII (Salpai)	·166	− ·623	− ·152		− ·775	70 21 12·889	4·7581289,3	57296·61	10·852
		XXI (Tirupanandál Mandap)	·166	−1·185	+ ·092		−1·093	39 57 27·161	4·5918607,1	39071·56	7·400
			·498				−2·412	180 0 0·000			
253		XVII (Salpai)	·167	+ ·241	− ·093		+ ·148	42 49 50·171	4·6105897,0	40793·38	7·726
		XXI (Tirupanandál Mandap)	·167	+ ·453	+ ·148		+ ·601	65 12 30·874	4·7361968,8	54474·96	10·317
		XXII (Nayinipiriyán)	·167	+ ·507	− ·055		+ ·452	71 57 38·955	4·7562971,8	57055·46	10·806
			·501				+1·201	180 0 0·000			
	500	XVI (Ayyampet)	·115	+ ·254		− ·185	+ ·069	56 56 6·554	4·6001744,9	39826·71	7·543
		XVII (Salpai)	·114	+ ·221		+ ·177	+ ·398	56 48 36·664	4·5995563,4	39770·07	7·532
		XIX (Kulattúr)	·115	+ ·539		+ ·008	+ ·547	66 15 16·782	4·6384871,9	43499·79	8·239
			·344				+1·014	180 0 0·000			
	501	XIX (Kulattúr)	·098	− ·713		− ·126	− ·839	88 39 56·023	4·6987647,3	49976·37	9·465
		XVII (Salpai)	·098	− ·339		+ ·122	− ·217	38 31 7·755	4·4932113,9	31132·31	5·896
		XX (Kachipĕrumál)	·098	− ·494		+ ·004	− ·490	52 48 56·222	4·6001744,9	39826·71	7·543
			·294				−1·546	180 0 0·000			
	502	XVII (Salpai)	·113	+ ·381		+ ·147	+ ·528	31 40 2·725	4·4597830,6	28825·91	5·459
		XX (Kachipĕrumál)	·113	+ ·953		− ·126	+ ·827	82 48 4·634	4·7361968,8	54474·96	10·317
		XXII (Nayinipiriyán)	·113	+ ·555		− ·021	+ ·534	65 31 52·641	4·6987647,3	49976·37	9·465
			·339				+1·889	180 0 0·000			
254		XXII (Nayinipiriyán)	·162	+ ·146	− ·129		+ ·017	57 4 11·765	4·7076911,0	51014·20	9·662
		XXI (Tirupanandál Mandap)	·163	− ·013	+ ·190		+ ·177	80 46 20·944	4·7780992,1	59992·81	11·362
		XXIII (Kumbakonam)	·162	− ·066	− ·061		− ·127	42 9 27·291	4·6105897,0	40793·38	7·726
			·487				+ ·067	180 0 0·000			

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
255		XXI (Tirupanandál Mandap)	·146	+ ·556	+ ·057		+ ·613	40 45 44·057	4·5719896,6	37324·13	7·069
		XXIII (Kumbakonam)	·146	+ ·583	− ·178		+ ·405	76 3 38·159	4·7441470,0	55481·35	10·508
		XXIV (Putagaram)	·146	+ ·509	+ ·121		+ ·630	63 10 37·784	4·7076911,0	51014·20	9·662
			·438				+1·648	180 0 0·000			
256		XXIV (Putagaram)	·136	+ ·467	+ ·071		+ ·538	70 3 57·692	4·7031633,1	50485·11	9·562
		XXIII (Kumbakonam)	·136	+ ·301	− ·198		+ ·103	65 54 20·117	4·6904064,8	49023·75	9·285
		XXVI (Álangudi)	·136	+ ·160	+ ·127		+ ·287	44 1 42·191	4·5719896,6	37324·13	7·069
			·408				+ ·928	180 0 0·000			
257		XXIII (Kumbakonam)	·126	− ·066	− ·126		− ·192	45 35 3·302	4·5700746,7	37159·91	7·038
		XXVI (Álangudi)	·126	+ ·058	+ ·194		+ ·252	58 23 15·216	4·6464483,5	44304·56	8·391
		XXVII (Víramangalam)	·127	− ·043	− ·068		− ·111	76 1 41·482	4·7031633,1	50485·11	9·562
			·379				− ·051	180 0 0·000			
	503	XXII (Nayinipiriyán)	·167	−1·135		− ·125	−1·260	52 24 51·913	4·6830598,9	48201·43	9·129
		XXIII (Kumbakonam)	·167	− ·845		+ ·279	− ·566	47 4 54·487	4·6487965,6	44544·75	8·437
		XXV (Mutuváncheri)	·168	− ·448		− ·154	− ·602	80 30 13·600	4·7780992,1	59992·81	11·362
			·502				−2·428	180 0 0·000			
	504	XXIII (Kumbakonam)	·168	+ ·503		+ ·284	+ ·787	83 12 35·739	4·7888200,7	61492·21	11·646
		XXV (Mutuváncheri)	·167	+ ·236		− ·114	+ ·122	45 40 44·475	4·6464483,5	44304·56	8·391
		XXVII (Víramangalam)	·168	+ ·294		− ·170	+ ·124	51 6 39·786	4·6830598,9	48201·43	9·129
			·503				+1·033	180 0 0·000			
258		XXVII (Víramangalam)	·145	+ ·075	− ·156		− ·081	67 57 21·344	4·7190502,1	52366·10	9·918
		XXVI (Álangudi)	·146	− ·252	+ ·218		− ·034	70 54 58·390	4·7274703,0	53391·27	10·112
		XXVIII (Arasapat)	·145	+ ·253	− ·062		+ ·191	41 7 40·266	4·5700746,7	37159·91	7·038
			·436				+ ·076	180 0 0·000			
259		XXVI (Álangudi)	·143	+ ·047	+ ·063		+ ·110	43 53 33·327	4·5830769,9	38289·26	7·252
		XXVIII (Arasapat)	·143	− ·013	− ·209		− ·222	64 37 47·185	4·6981064,6	49900·69	9·451
		XXIX (Parutikota)	·143	− ·515	+ ·146		− ·369	71 28 39·488	4·7190502,1	52366·10	9·918
			·429				− ·481	180 0 0·000			
260		XXIX (Parutikota)	·158	− ·024	+ ·070		+ ·046	66 8 12·538	4·7365938,5	54524·77	10·327
		XXVIII (Arasapat)	·159	+ ·186	− ·238		− ·052	73 54 24·339	4·7580418,7	57285·13	10·849
		XXXI (Púvatúr)	·158	− ·367	+ ·168		− ·199	39 57 23·123	4·5830769,9	38289·26	7·252
			·475				− ·205	180 0 0·000			
261		XXVIII (Arasapat)	·143	+ ·251	− ·179		+ ·072	36 58 34·769	4·5421461,0	34845·45	6·600
		XXXI (Púvatúr)	·144	− ·009	+ ·238		+ ·229	72 46 23·095	4·7429881,1	55333·49	10·480
		XXXII (Kakkrákota)	·143	− ·382	− ·059		− ·441	70 15 2·136	4·7365938,5	54524·77	10·327
			·430				− ·140	180 0 0·000			
	505	XXVII (Víramangalam)	·143	+ ·107		− ·245	− ·138	41 3 12·179	4·5674708,7	36937·79	6·996
		XXVIII (Arasapat)	·144	+ ·833		+ ·367	+1·200	67 16 4·586	4·7149455,1	51873·50	9·825
		XXX (Rárámutiraikota)	·144	+ ·971		− ·122	+ ·849	71 40 43·235	4·7274703,0	53391·27	10·112
			·431				+1·911	180 0 0·000			
	506	XXVIII (Arasapat)	·157	− ·480		+ ·321	− ·159	76 5 27·964	4·7685048,8	58682·00	11·114
		XXX (Rárámutiraikota)	·157	− ·647		− ·232	− ·879	66 14 49·234	4·7429881,1	55333·49	10·480
		XXXII (Kakkrákota)	·156	− ·013		− ·089	− ·102	37 39 42·802	4·5674708,7	36937·79	6·996
			·470				−1·140	180 0 0·000			
262		XXXII (Kakkrákota)	·130	+ ·099	− ·068		+ ·031	71 36 30·781	4·7064143,1	50864·45	9·633
		XXXI (Púvatúr)	·130	+ ·355	+ ·087		+ ·442	67 50 39·362	4·6958703,5	49644·41	9·402
		XXXIII (Pátharankota)	·129	+ ·285	− ·019		+ ·266	40 32 49·857	4·5421461,0	34845·45	6·600
			·389				+ ·739	180 0 0·000			

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Corrections to Observed Angle: Circuit	Corrections to Observed Angle: Non-circuit	Corrections to Observed Angle: Total	Corrected Plane Angle	Distance: Log. feet	Distance: Feet	Distance: Miles
			"	"	"	"	"	° ′ ″			
		XXXI (Púvatúr)	·125	− ·079	+ ·016		− ·063	39 11 17·422	4·5271855,4	33665·54	6·376
263		XXXIII (Pátharankota)	·126	+ ·165	− ·082		+ ·083	68 7 41·297	4·6941152,8	49444·19	9·364
		XXXIV (Patukota)	·126	+ ·101	+ ·066		+ ·167	72 41 1·281	4·7064143,1	50864·45	9·633
			·377				+ ·187	180 0 0·000			
		XXXIV (Patukota)	·115	− ·073	+ ·025		− ·048	67 54 50·897	4·6646312,7	46198·86	8·750
264		XXXIII (Pátharankota)	·116	− ·039	− ·097		− ·136	69 36 47·758	4·6696365,8	46734·39	8·851
		XXXVI (Kalúrunikád)	·115	+ ·178	+ ·072		+ ·250	42 28 21·345	4·5271855,4	33665·54	6·376
			·346				+ ·066	180 0 0·000			
		XXXIII (Pátharankota)	·141	+ ·430	− ·068		+ ·362	52 42 2·891	4·6248698,3	42157·01	7·984
265		XXXVI (Kalúrunikád)	·142	+ ·292	+ ·091		+ ·383	66 38 11·771	4·6870859,9	48650·35	9·214
		XXXVII (Kárakkurchi)	·141	+ ·322	− ·023		+ ·299	60 39 45·338	4·6646312,7	46198·86	8·750
			·424				+1·044	180 0 0·000			
		XXXII (Kakkrákota)	·124	+ ·332		− ·086	+ ·246	43 52 30·102	4·5538470,9	35797·04	6·780
	507	XXXIII (Pátharankota)	·124	+ ·045		+ ·139	+ ·184	62 8 19·770	4·6595516,9	45661·66	8·648
		XXXV (Kallakota)	·124	+ ·015		− ·053	− ·038	73 59 10·128	4·6958703,5	49644·41	9·402
			·372				+ ·392	180 0 0·000			
		XXXIII (Pátharankota)	·127	+ ·324		+ ·127	+ ·451	66 52 17·664	4·6789821,8	47750·96	9·044
	508	XXXV (Kallakota)	·127	+ ·417		− ·083	+ ·334	69 32 42·507	4·6870859,9	48650·35	9·214
		XXXVII (Kárakkurchi)	·126	− ·001		− ·044	− ·045	43 34 59·829	4·5538470,9	35797·04	6·780
			·380				+ ·740	180 0 0·000			
		XXXVII (Kárakkurchi)	·147	− ·183	− ·080		− ·263	67 57 33·980	4·7022853,1	50383·15	9·542
266		XXXVI (Kalúrunikád)	·147	− ·426	+ ·105		− ·321	61 10 58·842	4·6778291,4	47624·36	9·020
		XXXVIII (Merpanaikád)	·147	− ·160	− ·025		− ·185	50 51 27·178	4·6248698,3	42157·01	7·984
			·441				− ·769	180 0 0·000			
		XXXVI (Kalúrunikád)	·129	+ ·490	+ ·018		+ ·508	43 50 31·859	4·5613036,8	36416·96	6·897
267		XXXVIII (Merpanaikád)	·129	+ ·942	− ·092		+ ·850	62 45 29·781	4·6697170,5	46743·05	8·853
		XXXIX (Bĕtavayal)	·129	+ ·115	+ ·074		+ ·189	73 23 58·360	4·7022853,1	50383·15	9·542
			·387				+1·547	180 0 0·000			
		XXXIX (Bĕtavayal)	·125	+ ·472	+ ·027		+ ·499	69 31 23·334	4·6786174,3	47710·88	9·036
268		XXXVIII (Merpanaikád)	·124	+ ·366	− ·112		+ ·254	64 49 44·940	4·6636337,1	46092·86	8·730
		XLI (Mánúr)	·124	+ ·195	+ ·085		+ ·280	45 38 51·726	4·5613036,8	36416·96	6·897
			·373				+1·033	180 0 0·000			
		XXXVIII (Merpanaikád)	·130	− ·269	− ·091		− ·360	45 14 27·790	4·5686575,7	37038·85	7·015
269		XLI (Mánúr)	·130	− ·295	+ ·110		− ·185	68 36 0·285	4·6863290,4	48565·63	9·198
		XLII (Pallathivayal)	·130	− ·656	− ·019		− ·675	66 9 31·925	4·6786174,3	47710·88	9·036
			·390				−1·220	180 0 0·000			
		XXXVII (Kárakkurchi)	·098	− ·614		− ·119	− ·733	35 12 54·529	4·4509986,9	28248·71	5·350
	509	XXXVIII (Merpanaikád)	·099	− ·219		+ ·175	− ·044	68 20 3·317	4·6582686,1	45526·96	8·623
		XL (Kulamangalam)	·099	− ·281		− ·056	− ·337	76 27 2·154	4·6778291,4	47624·36	9·020
			·296				−1·114	180 0 0·000			
		XXXVIII (Merpanaikád)	·101	+ ·080		+ ·145	+ ·225	67 58 46·264	4·6639698,1	46128·55	8·736
	510	XL (Kulamangalam)	·101	− ·143		− ·104	− ·247	77 25 45·472	4·6863290,4	48565·63	9·198
		XLII (Pallathivayal)	·100	+ ·285		− ·041	+ ·244	34 35 28·264	4·4509986,9	28248·71	5·350
			·302				+ ·222	180 0 0·000			
		XLII (Pallathivayal)	·135	+ ·180	− ·092		+ ·088	74 8 48·643	4·7147618,7	51851·57	9·820
270		XLI (Mánúr)	·135	+ ·668	+ ·107		+ ·775	62 26 52·090	4·6793252,8	47788·71	9·051
		XLIII (Ŏkkúr)	·134	+ ·276	− ·015		+ ·261	43 24 19·267	4·5686575,7	37038·85	7·015
			·404				+1·124	180 0 0·000			

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
271		XLI (Mánúr)	·161	− ·417	+ ·017		− ·400	49 23 27·779	4·6364236,0	43293·59	8·200
		XLIII (Ŏkkúr)	·161	−1·010	− ·106		−1·116	65 12 31·813	4·7140951,3	51772·03	9·805
		XLIV (Káuád)	·161	− ·060	+ ·089		+ ·029	65 24 0·408	4·7147618,7	51851·57	9·820
			·483				−1·487	180 0 0·000			
272		XLIV (Kánád)	·167	+ ·128	+ ·023		+ ·151	66 52 54·304	4·7294395,4	53633·92	10·158
		XLIII (Ŏkkúr)	·167	+ ·357	− ·121		+ ·236	65 11 0·049	4·7237160,2	52931·72	10·025
		XLVI (Sirukambúr)	·166	+ ·375	+ ·098		+ ·473	47 56 5·647	4·6364236,0	43293·59	8·200
			·500				+ ·860	180 0 0·000			
273		XLIII (Ŏkkúr)	·148	+ ·100	− ·110		− ·010	41 53 35·802	4·5795052,2	37975·65	7·192
		XLVI (Sirukambúr)	·149	− ·068	+ ·126		+ ·058	67 31 57·289	4·7206119,6	52554·75	9·954
		XLVII (Manikamkota)	·149	+ ·214	− ·016		+ ·198	70 34 26·909	4·7294395,4	53633·92	10·158
			·446				+ ·246	180 0 0·000			
	511	XLII (Pallathivayal)	·119	+ ·312		− ·142	+ ·170	36 43 4·871	4·5062773,3	32083·17	6·076
		XLIII (Ŏkkúr)	·120	+ ·055		+ ·192	+ ·247	80 20 20·777	4·7234621,2	52900·78	10·019
		XLV (Sembalavayal)	·119	− ·039		− ·050	− ·089	62 56 34·352	4·6793252,8	47788·71	9·051
			·358				+ ·328	180 0 0·000			
	512	XLIII (Ŏkkúr)	·120	+ ·682		+ ·160	+ ·842	63 58 11·442	4·6819414,4	48077·45	9·106
		XLV (Sembalavayal)	·120	+ ·471		− ·119	+ ·352	79 11 11·892	4·7206119,6	52554·75	9·954
		XLVII (Manikamkota)	·119	+ ·216		− ·041	+ ·175	36 50 36·666	4·5062773,3	32083·17	6·076
			·359				+1·369	180 0 0·000			
274		XLVII (Manikamkota)	·140	+ ·072	− ·093		− ·021	68 31 5·419	4·7042421,4	50610·68	9·585
		XLVI (Sirukambúr)	·140	− ·014	+ ·094		+ ·080	67 11 49·480	4·7001671,3	50138·01	9·496
		XLVIII (Manĕgandi)	·140	− ·108	− ·001		− ·109	44 17 5·101	4·5795052,2	37975·65	7·192
			·420				− ·050	180 0 0·000			
275		XLVI (Sirukambúr)	·125	+ ·108	− ·011		+ ·097	37 50 2·612	4·5187301,1	33016·43	6·253
		XLVIII (Manĕgandi)	·126	− ·132	− ·083		− ·215	72 4 25·789	4·7093906,1	51214·22	9·700
		XLIX (Nambudalai)	·126	− ·059	+ ·094		+ ·035	70 5 31·599	4·7042421,4	50610·68	9·585
			·377				− ·083	180 0 0·000			
276		XLIX (Nambudalai)	·130	+ ·152	+ ·012		+ ·164	76 20 13·824	4·7328922,8	54062·02	10·239
		XLVIII (Manĕgandi)	·130	+ ·224	− ·126		+ ·098	67 15 42·748	4·7102222,4	51312·39	9·718
		LI (Ūrannankudi)	·130	+ ·044	+ ·114		+ ·158	36 24 3·428	4·5187301,1	33016·43	6·253
			·390				+ ·420	180 0 0·000			
277		XLVIII (Manĕgandi)	·173	− ·013	− ·101		− ·114	47 6 4·373	4·6405499,4	43706·89	8·278
		LI (Ūrannankudi)	·173	+ ·154	+ ·109		+ ·263	67 55 29·020	4·7426432,5	55289·58	10·472
		LII (Mutupatnam)	·173	+ ·098	− ·008		+ ·090	64 58 26·607	4·7328922,8	54062·02	10·239
			·519				+ ·239	180 0 0·000			
	513	XLVII (Manikamkota)	·151	− ·043		− ·173	− ·216	49 26 58·833	4·6233487,6	42009·62	7·956
		XLVIII (Manĕgandi)	·152	− ·016		+ ·178	+ ·162	65 28 33·800	4·7015694,8	50300·17	9·527
		L (Vĕnniyúr)	·151	+ ·343		− ·005	+ ·338	65 4 27·367	4·7001671,3	50138·01	9·496
			·454				+ ·284	180 0 0·000			
	514	XLVIII (Manĕgandi)	·165	+ ·115		+ ·133	+ ·248	63 48 7·303	4·7213125,6	52639·60	9·970
		L (Vĕnniyúr)	·165	+ ·267		− ·151	+ ·116	70 27 58·411	4·7426432,5	55289·58	10·472
		LII (Mutupatnam)	·164	+ ·402		+ ·018	+ ·420	45 43 54·286	4·6233487,6	42009·62	7·956
			·494				+ ·784	180 0 0·000			
278		LII (Mutupatnam)	·195	− ·802	− ·111		− ·913	66 32 27·112	4·7748190,6	59541·41	11·277
		LI (Ūrannankudi)	·195	− ·688	+ ·095		− ·593	71 7 49·112	4·7882956,4	61417·99	11·632
		LIII (Kŏdikulam)	·194	− ·556	+ ·016		− ·540	42 19 43·776	4·6405499,4	43706·89	8·278
			·584				−2·046	180 0 0·000			

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
279		LI (Ūrannankudi)	·111	+ ·510	− ·037		+ ·473	30 7 45·422	4·4801839,3	30212·31	5·722
		LIII (Kŏdikulam)	·111	+ ·664	− ·054		+ ·610	51 27 17·399	4·6727928,5	47075·27	8·916
		LIV (Pŏragudi)	·112	+ ·070	+ ·091		+ ·161	98 24 57·179	4·7748190,6	59541·41	11·277
			·334				+1·244	180 0 0·000			
280		LIV (Pŏragudi)	·117	+ ·023	− ·011		+ ·012	66 34 53·945	4·6980145,1	49890·12	9·449
		LIII (Kŏdikulam)	·118	+ ·075	− ·133		− ·058	79 39 35·324	4·7282370,6	53485·62	10·130
		LVI (Ramnad)	·117	− ·636	+ ·144		− ·492	33 45 30·731	4·4801839,3	30212·31	5·722
			·352				− ·538	180 0 0·000			
281		LIII (Kŏdikulam)	·165	− ·563	− ·121		− ·684	48 48 31·051	4·6436396,2	44018·94	8·337
		LVI (Ramnad)	·166	− ·415	+ ·105		− ·310	72 39 53·034	4·7469362,4	55838·82	10·576
		LVII (Sambuttiyendal)	·166	− ·625	+ ·016		− ·609	58 31 35·915	4·6980145,1	49890·12	9·449
			·497				−1·603	180 0 0·000			
	515	LII (Mutupatnam)	·187	− ·683		− ·187	− ·870	39 2 44·733	4·6122313,3	40947·87	7·755
		LIII (Kŏdikulam)	·187	+ ·683		+ ·177	+ ·860	70 4 15·873	4·7861130,3	61110·10	11·574
		LV (Náyanárkoil)	·187	+ ·051		+ ·010	+ ·061	70 52 59·394	4·7882956,4	61417·99	11·632
			·561				+ ·051	180 0 0·000			
	516	LIII (Kŏdikulam)	·167	+ ·287		+ ·115	+ ·402	67 40 35·635	4·7426998,1	55296·77	10·473
		LV (Náyanárkoil)	·167	− ·324		− ·144	− ·468	69 5 12·505	4·7469362,4	55838·82	10·576
		LVII (Sambuttiyendal)	·167	+ ·178		+ ·029	+ ·207	43 14 11·860	4·6122313,3	40947·87	7·755
			·501				+ ·141	180 0 0·000			
282		LVI (Ramnad)	·082	− ·091	− ·008		− ·099	43 2 48·439	4·4792759,5	30149·21	5·710
		LVII (Sambuttiyendal)	·082	− ·387	− ·038		− ·425	51 40 10·183	4·5396758,5	34647·81	6·562
		LVIII (Uttarakoshamangai)	·083	+ ·015	+ ·046		+ ·061	85 17 1·378	4·6436396,2	44018·94	8·337
			·247				− ·463	180 0 0·000			
283		LVII (Sambuttiyendal)	·103	− ·764	− ·054		− ·818	79 54 31·819	4·6855270,1	48476·02	9·181
		LVIII (Uttarakoshamangai)	·102	− ·110	+ ·034		− ·076	62 20 1·562	4·6395687,0	43608·25	8·259
		LXII (Arapoth)	·102	− ·599	+ ·020		− ·579	37 45 26·619	4·4792759,5	30149·21	5·710
			·307				−1·473	180 0 0·000			
284		LVIII (Uttarakoshamangai)	·134	− ·097	− ·015		− ·112	41 27 16·664	4·5578709,4	36130·25	6·843
		LXII (Arapoth)	·135	− ·279	− ·042		− ·321	75 53 31·704	4·7236948,6	52929·14	10·024
		LXI (Tanichanthai)	·134	− ·501	+ ·057		− ·444	62 39 11·632	4·6855270,1	48476·02	9·181
			·403				− ·877	180 0 0·000			
	517	LVI (Ramnad)	·095	− ·263		− ·004	− ·267	53 21 48·538	4·5531237,2	35737·46	6·768
		LVIII (Uttarakoshamangai)	·095	+ ·111		− ·019	+ ·092	75 33 40·907	4·6347742,5	43129·48	8·168
		LIX (Kánjarangudi)	·094	− ·004		+ ·023	+ ·019	51 4 30·555	4·5396758,5	34647·81	6·562
			·284				− ·156	180 0 0·000			
	518	LIX (Kánjarangudi)	·073	− ·062		·000	− ·062	58 29 44·045	4·5127302,8	32563·44	6·167
		LVIII (Uttarakoshamangai)	·072	+ ·429		− ·018	+ ·411	52 9 43·959	4·4794750,5	30163·04	5·713
		LX (Yervádi)	·073	+ ·031		+ ·018	+ ·049	69 20 31·996	4·5531237,2	35737·46	6·768
			·218				+ ·398	180 0 0·000			
	519	LVIII (Uttarakoshamangai)	·093	+ ·222		− ·028	+ ·194	43 12 14·951	4·5650394,7	36731·57	6·957
		LX (Yervádi)	·094	− ·012		+ ·003	− ·009	99 25 44·727	4·7236948,6	52929·14	10·024
		LXI (Tanichanthai)	·093	+ ·180		+ ·025	+ ·205	37 22 0·322	4·5127302,8	32563·44	6·167
			·280				+ ·390	180 0 0·000			
285		LXI (Tanichanthai)	·131	+ ·131	− ·001		+ ·130	73 58 41·769	4·7085216,5	51111·85	9·680
		LXII (Arapoth)	·130	+ ·009	− ·077		− ·068	63 13 21·862	4·6764643,4	47474·93	8·991
		LXIII (Kadaládi)	·130	− ·049	+ ·078		+ ·029	42 47 56·369	4·5578709,4	36130·25	6·843
			·391				+ ·091	180 0 0·000			

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. Feet	Feet	Miles
			"	"	"	"	"	° ′ "			
286		LXII (Arapoth)	·121	+ ·195	− ·086		+ ·109	34 46 19·808	4·4920408,4	31048·52	5·880
		LXIII (Kadaládi)	·122	− ·405	+ ·075		− ·330	75 22 7·778	4·7216095,9	52675·61	9·976
		LXV (Kidátirukai)	·121	− ·246	+ ·011		− ·235	69 51 32·414	4·7085216,5	51111·85	9·680
			·364				− ·456	180 0 0·000			
287		LXV (Kidátirukai)	·091	+ ·192	− ·056		+ ·136	78 11 54·285	4·6393199,1	43583·28	8·254
		LXIII (Kadaládi)	·090	+ ·134	+ ·041		+ ·175	57 35 16·455	4·5750515,1	37588·20	7·119
		LXVII (Pulápati)	·090	+ ·115	+ ·015		+ ·130	44 12 49·260	4·4920408,4	31048·52	5·880
			·271				+ ·441	180 0 0·000			
288		LXIII (Kadaládi)	·099	+ ·090	− ·019		+ ·071	39 26 35·742	4·4779605,7	30058·03	5·693
		LXVII (Pulápati)	·100	+ ·247	− ·041		+ ·206	73 27 23·596	4·6566115,7	45353·58	8·590
		LXVI (Taraigudi)	·099	+ ·221	+ ·060		+ ·281	67 6 0·662	4·6393199,1	43583·28	8·254
			·298				+ ·558	180 0 0·000			
	520	LXI (Tanichanthai)	·116	− ·184		− ·010	− ·194	38 48 7·260	4·5095301,7	32324·38	6·122
		LXIII (Kadaládi)	·117	− ·150		− ·073	− ·223	74 13 22·020	4·6958404,0	49640·99	9·402
		LXIV (Ôpilán)	·117	+ ·124		+ ·083	+ ·207	66 58 30·720	4·6764643,4	47474·93	8·991
			·350				− ·210	180 0 0·000			
	521	LXIII (Kadaládi)	·110	+ ·230		− ·102	+ ·128	70 34 40·968	4·6638673,1	46117·66	8·734
		LXIV (Ôpilán)	·109	+ ·300		+ ·009	+ ·309	68 2 37·680	4·6566115,7	45353·58	8·590
		LXVI (Taraigudi)	·109	+ ·958		+ ·093	+1·051	41 22 41·352	4·5095301,7	32324·38	6·122
			·328				+1·488	180 0 0·000			
289		LXVII (Pulápati)	·076	+ ·091	− ·052		+ ·039	73 19 4·653	4·5769156,9	37749·89	7·150
		LXVI (Taraigudi)	·075	+ ·467	+ ·041		+ ·508	56 58 35·713	4·5190659,3	33041·97	6·258
		LXVIII (Annapúnáyakanpati)	·075	+ ·268	+ ·011		+ ·279	49 42 19·634	4·4779605,7	30058·03	5·693
			·226				+ ·826	180 0 0·000			
290		LXVI (Taraigudi)	·083	− ·301	+ ·002		− ·299	62 21 38·448	4·5584408,5	36177·69	6·852
		LXVIII (Annapúnáyakanpati)	·082	− ·197	− ·048		− ·245	50 3 49·183	4·4957216,9	31312·78	5·930
		LXIX (Súrangudi)	·083	+ ·296	+ ·046		+ ·342	67 34 32·369	4·5769156,9	37749·89	7·150
			·248				− ·202	180 0 0·000			
291		LXIX (Súrangudi)	·121	− ·187	− ·014		− ·201	52 20 20·908	4·6296490,6	42623·50	8·073
		LXVIII (Annapúnáyakanpati)	·122	+ ·025	− ·057		− ·032	85 26 42·466	4·7297469,0	53671·89	10·165
		LXXI (Mŏtúruni)	·121	+ ·646	+ ·071		+ ·717	42 12 56·626	4·5584408,5	36177·69	6·852
			·364				+ ·484	180 0 0·000			
292		LXVIII (Annapúnáyakanpati)	·101	− ·480	− ·069		− ·549	40 31 26·430	4·4913802,1	31001·32	5·871
		LXXI (Mŏtúruni)	·102	− ·219	+ ·056		− ·163	76 10 39·045	4·6658602,5	46329·78	8·775
		LXXII (Melakalúruni)	·101	+ ·153	+ ·013		+ ·166	63 17 54·525	4·6296490,6	42623·50	8·073
			·304				− ·546	180 0 0·000			
	522	LXVII (Pulápati)	·088	+ ·201		− ·089	+ ·112	54 41 36·854	4·5437929,7	34977·84	6·625
		LXVIII (Annapúnáyakanpati)	·089	− ·239		+ ·087	− ·152	74 52 15·769	4·6167447,7	41375·64	7·836
		LXX (Mutúruni)	·088	− ·707		+ ·002	− ·705	50 26 7·377	4·5190659,3	33041·97	6·258
			·265				− ·745	180 0 0·000			
	523	LXVIII (Annapúnáyakanpati)	·110	+ ·273		+ ·076	+ ·349	59 23 25·939	4·6177160,3	41468·28	7·854
		LXX (Mutúruni)	·111	+ ·446		− ·075	+ ·371	74 3 41·080	4·6658602,6	46329·78	8·775
		LXXII (Melakalúruni)	·110	− ·078		− ·001	− ·079	46 32 52·981	4·5437929,7	34977·84	6·625
			·331				+ ·641	180 0 0·000			
293		LXXII (Melakalúruni)	·174	+ ·174	− ·039		+ ·135	89 31 26·181	4·8862753,1	76961·82	14·576
		LXXI (Mŏtúruni)	·173	+ ·040	+ ·008		+ ·048	66 43 21·715	4·8494181,5	70699·80	13·390
		LXXIV (Mínákshi)	·173	+ ·226	+ ·031		+ ·257	23 45 12·104	4·4913802,1	31001·32	5·871
			·520				+ ·440	180 0 0·000			

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
294		LXXI (Mŏtúruni)	·232	+ ·217	+ ·001		+ ·218	53 20 16·956	4·7906824,4	61756·46	11·696
		LXXIV (Mínákshi)	·232	− ·157	− ·022		− ·179	38 6 50·909	4·6768618,6	47518·40	9·000
		LXXIII (Supalápuram)	·232	− ·334	+ ·021		− ·313	88 32 52·135	4·8862753,1	76961·82	14·576
			·696				− ·274	180 0 0·000			
	524	LXXII (Melakalúruni)	·304	− ·116		− ·005	− ·121	52 38 17·115	4·7906824,4	61756·46	11·696
		LXXIV (Mínákshi)	·304	+ ·069		+ ·009	+ ·078	61 52 3·114	4·8358141,9	68519·50	12·977
		LXXIII (Supalápuram)	·305	− ·030		− ·004	− ·034	65 29 39·771	4·8494181,5	70699·80	13·390
			·913				− ·077	180 0 0·000			
295		LXXIV (Mínákshi)	·221	− ·023	− ·018		− ·041	104 51 11·478	4·9373969,2	86575·88	16·397
		LXXIII (Supalápuram)	·221	− ·354	+ ·013		− ·341	31 33 26·328	4·6709497,3	46875·92	8·878
		LXXXIII (Koilpati)	·221	− ·010	+ ·005		− ·005	43 35 22·194	4·7906824,4	61756·46	11·696
			·663				− ·387	180 0 0·000			
296		LXXIII (Supalápuram)	·429	+ ·408	+ ·006		+ ·414	77 59 24·825	4·9841659,6	96419·75	18·261
		LXXXIII (Koilpati)	·429	− ·158	− ·023		− ·181	40 34 38·820	4·8070081,8	64122·16	12·144
		LXXXV (Kulayanallúr)	·429	+ ·267	+ ·017		+ ·284	61 25 56·355	4·9373969,2	86575·88	16·397
			1·287				+ ·517	180 0 0·000			
	525	LXXIV (Mínákshi)	·355	− ·209		+ ·003	− ·206	68 51 59·789	4·9841659,6	96419·75	18·261
		LXXXIII (Koilpati)	·356	− ·168		− ·018	− ·186	84 10 1·308	5·0121492,9	102836·97	19·477
		LXXXV (Kulayanallúr)	·355	+ ·233		+ ·015	+ ·248	26 57 58·903	4·6709497,3	46875·92	8·878
			1·066				− ·144	180 0 0·000			

Note.—Stations LXXXIII (Koilpati), and LXXXV (Kulayanallúr) appertain to the Great Arc Meridional Series, Section 8° to 18°.

June, 1886.

W. H. COLE,
In Charge of Computing Office.

CEYLON BRANCH SERIES OF THE SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. TRIANGLES.

No. of Triangle: Circuit	No. of Triangle: Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Circuit	Non-circuit	Total	Corrected Plane Angle	Distance: Log. feet	Feet	Miles
			"	"	"	"	"	° ′ "			
	526	LIX (Kánjarangudi)	·063	+ ·244			+ ·244	42 29 1·071	4·4232913,7	26502·78	5·019
		LX (Yervádi)	·063	+ ·072			+ ·072	87 16 59·139	4·5932550,2	39197·20	7·424
		LXXV (Púvarasanhalli Tívu)	·063	− ·187			− ·187	50 13 59·790	4·4794750,5	30163·04	5·713
			·189				+ ·129	180 0 0·000			
	527	LIX (Kánjarangudi)	·066	+ ·481			+ ·481	44 28 20·245	4·4404248,2	27569·24	5·221
		LXXV (Púvarasanhalli Tívu)	·066	+ ·302			+ ·302	50 37 35·036	4·4831709,4	30420·82	5·762
		LXXVI (Appa Tívu)	·066	+ ·835			+ ·835	84 54 4·719	4·5932550,2	39197·20	7·424
			·198				+1·618	180 0 0·000			
	528	LIX (Kánjarangudi)	·073	+ ·725			+ ·725	86 57 21·372	4·6199974,1	41686·69	7·895
		LX (Yervádi)	·072	− ·031			− ·031	46 46 44·887	4·4831709,4	30420·82	5·762
		LXXVI (Appa Tívu)	·072	+ ·803			+ ·803	46 15 53·741	4·4794750,5	30163·04	5·713
			·217				+1·497	180 0 0·000			
	529	LIX (Kánjarangudi)	·084	+ ·472			+ ·472	80 56 19·978	4·6315431,1	42809·79	8·108
		LXXVI (Appa Tívu)	·084	+ ·326			+ ·326	54 29 40·632	4·5476537,7	35290·17	6·684
		LXXVII (Pĕriyapatnam)	·083	+ ·023			+ ·023	44 33 59·390	4·4831709,4	30420·82	5·762
			·251				+ ·821	180 0 0·000			
	530	LXXVI (Appa Tívu)	·085	− ·262			− ·262	36 33 10·993	4·4255512,6	26641·05	5·046
		LXXVII (Pĕriyapatnam)	·085	− ·229			− ·229	70 18 20·126	4·6244425,8	42115·56	7·976
		LXXVIII (Válai Tívu)	·085	− ·224			− ·224	73 8 28·881	4·6315431,1	42809·79	8·108
			·255				− ·715	180 0 0·000			

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
		LIX (Kánjarangudi)	·101	+ ·123			+ ·123	53 28 18·022	4·6244425,2	42115·56	7·976
	531	LXXVI (Appa Tívu)	·102	+ ·064			+ ·064	91 2 51·692	4·7193501,8	52402·27	9·925
		LXXVIII (Válai Tívu)	·101	+ ·017			+ ·017	35 28 50·286	4·4831709,4	30420·82	5·762
			·304				+ ·204	180 0 0·000			
		LXXVII (Pĕriyapatnam)	·108	+ ·139			+ ·139	68 27 14·311	4·7136637,6	51720·63	9·796
	532	LXXVIII (Válai Tívu)	·108	+ ·049			+ ·049	82 55 9·361	4·7417985,2	55182·14	10·451
		LXXIX (Rámaswámi Madam)	·108	− ·164			− ·164	28 37 36·328	4·4255512,6	26641·05	5·046
			·324				+ ·024	180 0 0·000			
		LXXVIII (Válai Tívu)	·081	− ·109			− ·109	25 22 1·300	4·3456662,5	22164·93	4·198
	533	LXXIX (Rámaswámi Madam)	·081	+ ·011			+ ·011	63 11 27·040	4·6644162,7	46175·99	8·745
		LXXX (Musal Tívu)	·081	+ ·111			+ ·111	91 26 31·660	4·7136637,6	51720·63	9·796
			·243				+ ·013	180 0 0·003			
		LXXVII (Pĕriyapatnam)	·092	− ·105			− ·105	46 49 47·253	4·6644162,2	46175·99	8·745
	534	LXXVIII (Válai Tívu)	·093	− ·060			− ·060	108 17 10·757	4·7789905,8	60116·07	11·386
		LXXX (Musal Tívu)	·092	+ ·232			+ ·232	24 53 1·990	4·4255512,6	26641·05	5·046
			·277				+ ·067	180 0 0·000			
		LXXIX (Rámaswámi Madam)	·044	+ 1·039			+ 1·039	88 30 53·285	4·5177590,0	32942·69	6·239
	535	LXXX (Musal Tívu)	·044	+ ·554			+ ·554	49 12 59·780	4·3971065,8	24952·07	4·726
		LXXXI (Marakayárpatnam)	·043	+ ·018			+ ·018	42 16 6·935	4·3456662,5	22164·93	4·198
			·131				+ 1·611	180 0 0·000			
		LXXX (Musal Tívu)	·056	+ ·272			+ ·272	31 16 20·926	4·3374832,8	21751·20	4·120
	536	LXXXI (Marakayárpatnam)	·057	+ ·133			+ ·133	96 53 44·036	4·6190722,3	41597·97	7·878
		LXXXII (Púmurichán)	·056	+ ·454			+ ·454	51 49 55·038	4·5177590,0	32942·69	6·239
			·169				+ ·859	180 0 0·000			
		LXXIX (Rámaswámi Madam)	·072	+ ·357			+ ·357	69 33 30·005	4·6190722,1	41597·97	7·878
	537	LXXX (Musal Tívu)	·072	+ ·826			+ ·826	80 29 20·734	4·6413083,3	43783·29	8·292
		LXXXII (Púmurichán)	·072	+ ·673			+ ·673	29 57 9·261	4·3456662,5	22164·93	4·198
			·216				+ 1·856	180 0 0·000			
		LXXXI (Marakayárpatnam)	·075	+ ·528			+ ·528	42 57 43·443	4·7022517,1	50379·25	9·542
	538	LXXXII (Púmurichán)	·075	+ ·784			+ ·784	119 55 32·779	4·8066318,6	64066·63	12·134
		LXXXIII (Gandhamána)	·075	+ ·283			+ ·283	17 6 43·778	4·3374832,8	21751·20	4·120
			·225				+ 1·595	180 0 0·000			
		LXXXII (Púmurichán)	·056	+ ·078			+ ·078	16 16 44·882	4·1548521,1	14284·08	2·705
	539	LXXXIII (Gandhamána)	·057	− ·032			− ·032	82 21 20·631	4·7033256,5	50503·98	9·565
		LXXXV (Masánam Karai)	·056	+ ·163			+ ·163	81 21 54·487	4·7022517,1	50379·25	9·542
			·169				+ ·209	180 0 0·000			
		LXXXIII (Gandhamána)	·097	− ·057			− ·057	92 3 41·976	4·9428413,4	87668·05	16·604
	540	LXXXV (Masánam Karai)	·097	+ ·066			+ ·066	78 34 2·089	4·9344186,8	85984·22	16·285
		LXXXVII (Kachi Tívu, S.)	·097	+ ·002			+ ·002	9 22 15·935	4·1548521,1	14284·08	2·705
			·291				+ ·011	180 0 0·000			
		LXXXIII (Gandhamána)	·026	− ·031			− ·031	2 33 59·473	3·5923797,8	3911·83	0·741
	541	LXXXVI (Kachi Tívu, N.)	·026					100 10 29·221	4·9344187,6	85984·22	16·285
		LXXXVII (Kachi Tívu, S.)	·026					77 15 31·306	4·9304749,0	85206·92	16·138
			·078					180 0 0·000			
		LXXXI (Marakayárpatnam)	·044	+ ·248			+ ·248	7 24 30·594	3·9720515,3	9376·73	1·776
	542	LXXXIII (Gandhamána)	·045	+ ·308			+ ·308	110 49 40·783	4·8323047,8	67968·04	12·873
		LXXXIV (Pisásu Mundal)	·044	+ ·277			+ ·277	61 45 48·623	4·8066318,6	64066·63	12·134
			·133				+ ·833	180 0 0·000			

No. of Triangle Circuit	No. of Triangle Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Circuit	Non-circuit	Total	Corrected Plane Angle	Distance: Log. feet	Feet	Miles
			"	"	"	"	"	° ′ ″			
	543	LXXXIII (Gandhamána)	·052	+ ·009			+ ·009	55 4 33·007	4·9042183,3	80208·12	15·191
		LXXXIV (Pisásu Mundal)	·052	+ ·601			+ ·601	119 25 25·769	4·9304749,0	85206·92	16·138
		LXXXVI (Kachi Tívu, N.)	·051	+ ·655			+ ·655	5 30 1·224	3·9720515,3	9376·73	1·776
			·155				+1·265	180 0 0·000			
	544	LXXXVI (Kachi Tívu, N.)	·023					79 58 42·582	4·8821782,1	76239·18	14·439
		LXXXVII (Kachi Tívu, S.)	·024					97 7 31·019	4·8854886,3	76822·53	14·550
		LXXXIX (Ūrimunai)	·023	+ ·082			+ ·082	2 53 46·399	3·5923797,8	3911·83	0·741
			·070					180 0 0·000			
	545	LXXXVI (Kachi Tívu, N.)	·213	+ ·114			+ ·114	27 46 30·751	4·5631194,9	36569·54	6·926
		LXXXIX (Ūrimunai)	·213	+ ·155			+ ·155	74 0 10·152	4·8775777,8	75435·85	14·287
		LXXXVIII (Āmanakamunai)	·214	+ ·311			+ ·311	78 13 19·097	4·8854886,3	76822·53	14·550
			·640				+ ·580	180 0 0·000			
	546	LXXXVI (Kachi Tívu, N.)	·023					107 45 13·547	4·8849040,9	76719·21	14·530
		LXXXVII (Kachi Tívu, S.)	·022					69 27 46·171	4·8775779,1	75435·85	14·287
		LXXXVIII (Āmanakamunai)	·022	+ ·184			+ ·184	2 47 0·282	3·5923797,8	3911·83	0·741
			·067					180 0 0·000			

June, 1887.

W. H. COLE,
In charge of Computing Office.

SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

Station A				Side A B			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
74	XXXIV (Mávandúr)	12 44 37·47	79 42 26·53	320 17 45·10	5·1359072,7	140 20 57·43	XXXIX (Avirimodu)
"	" "	"	"	29 15 3·12	5·0118938,3	209 13 12·34	I (Pŏnnúr)
"	" "	"	"	97 57 0·25	5·0375262,0	277 52 59·12	II (Kaniyanúr)
	XXXIX (Avirimodu)	12 27 13·49	79 57 8·32	96 29 41·08	5·1412892,3	276 24 41·08	I (Pŏnnúr)
	" "	"	"	33 50 17·01	5·0488086,3	213 48 2·88	IV (Pĕrumukkal)
121	I (Pŏnnúr)	12 29 47·84	79 33 59·51	151 5 51·18	5·0777967,0	331 3 43·30	II (Kaniyanúr)
"	" "	"	"	95 2 27·66	4·9598288,7	274 59 9·09	III (Narasingapuram)
"	" "	"	"	325 11 53·47	5·1209849,5	145 14 36·09	IV (Pĕrumukkal)
"	" "	"	"	27 11 40·64	5·0047771,0	207 10 0·77	V (Gingee)
	II (Kaniyanúr)	12 47 6·42	79 24 15·17	18 48 19·29	5·0093783,6	198 47 6·45	III (Narasingapuram)
	III (Narasingapuram)	12 31 6·87	79 18 42·60	335 27 31·91	5·0318900,0	155 29 8·60	V (Gingee)
	IV (Pĕrumukkal)	12 11 51·34	79 46 39·97	98 43 22·53	5·0899894,0	278 39 2·85	" "
	" "	"	"	34 46 33·56	5·0328607,7	214 44 23·89	VI (Kallapat)
	" "	"	"	57 0 28·54	5·1866803,8	236 55 56·65	VII (Mallipat)
122	V (Gingee)	12 14 55·66	79 26 13·45	330 40 17·30	5·0896705,3	150 42 24·49	VI (Kallapat)
"	" "	"	"	4 1 1·33	5·0111996,7	184 0 46·14	VII (Mallipat)
	VI (Kallapat)	11 57 12·30	79 36 20·14	94 7 20·48	4·8297847,7	274 4 59·75	" "
	" "	"	"	40 4 26·08	5·0288119,2	220 2 3·97	VIII (Chĕndamangalam)
	" "	"	"	8 21 45·53	5·0373916,7	188 21 12·89	X (Vallam)
123	VII (Mallipat)	11 58 0·26	79 25 1·02	0 52 57·47	4·9377134,1	180 52 54·71	VIII (Chĕndamangalam)

Note.—Stations XXXIV (Mávandúr) and XXXIX (Avirimodu) appertain to the Madras Longitudinal Series.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
123	VII (Mallipat)	11 58 0·26	79 25 1·02	36 56 25·79	4·8852339,0	216 54 50·13	IX (Kiliyúr)
124	VIII (Chĕndamangalam)	11 43 40·90	79 24 47·59	119 24 52·01	4·7112907,8	299 23 20·02	„ „
„	„ „	„	„	296 10 14·88	4·7709171,8	116 12 2·90	X (Vallam)
„	„ „	„	„	58 49 30·72	4·5740883,4	238 48 25·22	XI (Ulundúrpet)
„	„ „	„	„	345 20 32·40	4·6050657,1	165 20 53·16	XII (Koilánkuppam)
	IX (Kiliyúr)	11 47 51·41	79 17 16·39	344 5 1·26	4·6670081,1	164 5 27·34	XI (Ulundúrpet)
	X (Vallam)	11 39 22·58	79 33 40·60	73 11 40·01	4·6501374,8	253 10 13·17	XII (Koilánkuppam)
	„ „	„	„	359 29 18·67	4·6160604,8	179 29 19·42	XIII (Seppalánattam)
	XI (Ulundúrpet)	11 40 28·25	79 19 24·61	294 47 58·83	4·6682275,3	114 49 24·75	XII (Koilánkuppam)
	„ „	„	„	329 14 16·89	4·7108569,0	149 15 10·13	XIV (Kánádakŏndán)
125	XII (Koilánkuppam)	11 37 14·34	79 26 30·15	303 19 21·69	4·7130365,1	123 20 48·85	XIII (Seppalánattam)
„	„ „	„	„	33 3 3·93	4·4677970,5	213 2 31·57	XIV (Kánádakŏndán)
	XIII (Seppalánattam)	11 32 32·79	79 33 44·31	93 39 38·61	4·7729688,8	273 37 39·44	„ „
	„ „	„	„	1 20 11·53	4·8289811,1	181 20 8·39	XV (Pŏdaiyúr)
	„ „	„	„	31 12 42·57	4·8795147,5	211 11 24·18	XVI (Ayyampet)
126	XIV (Kánádakŏndán)	11 33 10·17	79 23 49·04	321 0 14·87	4·9618530,0	141 2 9·94	XV (Pŏdaiyúr)
„	„ „	„	„	343 47 13·61	4·8538177,7	163 47 53·43	XVI (Ayyampet)
	XV (Pŏdaiyúr)	11 21 23·85	79 33 28·49	93 59 3·84	4·5773068,4	273 57 49·19	„ „
	„ „	„	„	34 10 17·95	4·6788044,9	214 9 25·14	XVII (Salpai)
	„ „	„	„	347 41 24·29	4·7075143,4	167 41 45·67	XVIII (Kuchúr)
127	XVI (Ayyampet)	11 21 49·83	79 27 9·52	345 29 26·77	4·6384871,9	165 29 48·25	XVII (Salpai)
„	„ „	„	„	42 25 33·44	4·5995563,4	222 24 40·49	XIX (Kulattúr)
128	XVII (Salpai)	11 14 52·05	79 28 59·05	285 18 57·38	4·5918607,1	105 20 11·16	XVIII (Kuchúr)
„	„ „	„	„	108 41 11·47	4·6001744,9	288 39 57·39	XIX (Kulattúr)
„	„ „	„	„	70 10 3·61	4·6987647,3	250 8 31·66	XX (Kachipĕrumál)
„	„ „	„	„	355 40 10·44	4·7562971,8	175 40 18·82	XXI (Tirupanandál Mandap)
„	„ „	„	„	38 30 0·78	4·7361968,8	218 28 54·67	XXII (Nayinipiriyán)
	XVIII (Kuchúr)	11 13 9·60	79 35 17·74	35 38 51·04	4·7581289,3	215 37 46·15	XXI (Tirupanandál Mandap)
	XIX (Kulattúr)	11 16 58·57	79 22 39·84	17 19 53·51	4·4932113,9	197 19 35·34	XX (Kachipĕrumál)
	XX (Kachipĕrumál)	11 12 3·74	79 21 6·65	332 56 36·41	4·4597830,6	152 57 1·92	XXII (Nayinipiriyán)
	XXI (Tirupanandál Mandap)	11 5 27·65	79 29 42·33	110 27 47·78	4·6105897,0	290 26 33·79	„ „
	„ „	„	„	29 41 26·67	4·7076911,0	209 40 38·13	XXIII (Kumbakonam)
	„ „	„	„	348 55 42·47	4·7441470,0	168 56 2·91	XXIV (Putagaram)
129	XXII (Nayinipiriyán)	11 7 49·06	79 23 18·37	347 30 45·72	4·7780992,1	167 31 10·68	XXIII (Kumbakonam)
„	„ „	„	„	39 55 37·80	4·6487965,6	219 54 42·60	XXV (Mutuváncheri)
130	XXIII (Kumbakonam)	10 58 7·97	79 25 28·62	285 44 16·44	4·5719896,6	105 45 24·98	XXIV (Putagaram)
„	„ „	„	„	120 26 16·03	4·6830598,9	300 24 56·37	XXV (Mutuváncheri)
„	„ „	„	„	351 38 36·69	4·7031633,1	171 38 50·62	XXVI (Álangudi)
„	„ „	„	„	37 13 40·12	4·6464483,5	217 12 49·15	XXVII (Víramangalam)
	XXIV (Putagaram)	10 56 27·48	79 31 29·29	35 41 27·15	4·6904064,8	215 40 32·94	XXVI (Álangudi)

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	XXV (Mutuváncheri)	11 2 10·14	79 18 31·26	346 5 41·01	4·7888200,7	166 6 9·20	XXVII (Víramangalam)
	XXVI (Álangudi)	10 49 52·44	79 26 42·25	113 15 35·27	4·5700746,7	293 14 30·76	„ „
	„ „	„	„	42 20 36·74	4·7190502,1	222 19 30·56	XXVIII (Arasapat)
	„ „	„	„	358 27 3·27	4·6981064,6	178 27 5·80	XXIX (Parutikota)
181	XXVII (Víramangalam)	10 52 17·97	79 20 59·58	1 11 52·25	4·7274703,0	181 11 50·15	XXVIII (Arasapat)
„	„ „	„	„	42 15 4·57	4·7149455,1	222 13 58·88	XXX (Rárámutiraikota)
182	XXVIII (Arasapat)	10 43 28·40	79 20 48·39	286 57 17·89	4·5830769,9	106 58 26·16	XXIX (Parutikota)
„	„ „	„	„	113 55 45·42	4·5674708,7	293 54 42·26	XXX (Rárámutiraikota)
„	„ „	„	„	0 51 42·39	4·7365938,5	180 51 40·87	XXXI (Púvatúr)
„	„ „	„	„	37 50 17·30	4·7429881,1	217 49 14·31	XXXII (Kakkrákota)
	XXIX (Parutikota)	10 41 37·57	79 26 55·79	40 50 13·47	4·7580418,7	220 49 4·15	XXXI (Púvatúr)
	XXX (Rárámutiraikota)	10 45 56·99	79 15 9·62	0 9 31·65	4·7685048,8	180 9 31·35	XXXII (Kakkrákota)
	XXXI (Púvatúr)	10 34 27·54	79 20 40·16	108 5 17·63	4·5421461,0	288 4 16·59	„ „
	„ „	„	„	40 14 38·14	4·7064143,1	220 13 37·99	XXXIII (Pátharankota)
	„ „	„	„	1 3 20·59	4·6941152,8	181 3 18·93	XXXIV (Patukota)
183	XXXII (Kakkrákota)	10 36 14·82	79 15 7·99	359 40 47·50	4·6958703,5	179 40 48·01	XXXIII (Pátharankota)
„	„ „	„	„	43 33 17·73	4·6595516,9	223 32 19·93	XXXV (Kallakota)
184	XXXIII (Pátharankota)	10 28 2·31	79 15 10·77	288 21 19·42	4·5271855,4	108 22 17·52	XXXIV (Patukota)
„	„ „	„	„	117 32 28·11	4·5538470,9	297 31 30·18	XXXV (Kallakota)
„	„ „	„	„	357 58 7·29	4·6646312,7	177 58 10·25	XXXVI (Kalúrunikád)
„	„ „	„	„	50 40 10·32	4·6870859,9	230 39 2·08	XXXVII (Kárakkurchi)
	XXXIV (Patukota)	10 26 17·09	79 20 31·03	40 27 26·51	4·6696365,8	220 26 31·71	XXXVI (Kalúrunikád)
	XXXV (Kallakota)	10 30 46·48	79 9 52·55	7 4 12·81	4·6789821,8	187 4 2·13	XXXVII (Kárakkurchi)
	XXXVI (Kalúrunikád)	10 20 24·26	79 15 27·17	111 19 58·34	4·6248698,3	291 18 47·56	„ „
	„ „	„	„	50 8 59·35	4·7022853,1	230 7 50·10	XXXVIII (Merpanaikád)
	„ „	„	„	6 18 27·36	4·6697170,5	186 18 18·19	XXXIX (Rětavayal)
185	XXXVII (Kárakkurchi)	10 22 56·34	79 8 53·65	359 16 21·69	4·6778291,4	179 16 22·78	XXXVIII (Merpanaikád)
„	„ „	„	„	34 29 16·32	4·6582686,1	214 28 30·01	XL (Kulamangalam)
186	XXXVIII (Merpanaikád)	10 15 3·90	79 8 59·71	292 53 20·01	4·5613036,8	112 54 19·70	XXXIX (Rětavayal)
„	„ „	„	„	110 56 19·36	4·4509986,9	290 55 32·26	XL (Kulamangalam)
„	„ „	„	„	357 43 5·07	4·6786174,3	177 43 8·44	XLI (Mánúr)
„	„ „	„	„	42 57 32·99	4·6863290,4	222 56 34·29	XLII (Pallathivayal)
	XXXIX (Rětavayal)	10 12 43·33	79 14 35·74	43 22 56·24	4·6636337,1	223 22 0·29	XLI (Mánúr)
	XL (Kulamangalam)	10 16 44·02	79 4 35·40	8 21 17·83	4·6639698,1	188 21 5·93	XLII (Pallathivayal)
	XLI (Mánúr)	10 7 10·93	79 9 18·73	109 7 8·02	4·5686575,7	289 6 6·35	„ „
	„ „	„	„	46 40 15·80	4·7147618,7	226 39 9·78	XLIII (Ökkúr)
	„ „	„	„	357 16 47·86	4·7140951,3	177 16 52·15	XLIV (Kánád)
187	XLII (Pallathivayal)	10 9 11·23	79 3 28·28	3 14 55·12	4·6793252,8	183 14 50·38	XLIII (Ökkúr)
„	„ „	„	„	39 58 0·11	4·7234621,2	219 57 0·48	XLV (Sembalavayal)
188	XLIII (Ökkúr)	10 1 17·88	79 3 1·17	291 51 41·75	4·6364236,0	111 52 51·58	XLIV (Kánád)

Station A				Side A B			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
138	XLIII (Ŏkkúr)	10 1 17·88	79 3 1·17	102 54 29·48	4·5062773,3	282 53 34·95	XLV (Sembalavayal)
"	" "	"	"	357 2 41·97	4·7294395,4	177 2 46·75	XLVI (Sirukambúr)
"	" "	"	"	38 56 17·92	4·7206119,6	218 55 20·72	XLVII (Manikamkota)
	XLIV (Kánád)	9 58 37·87	79 9 43·32	44 59 57·11	4·7237160,2	224 58 52·56	XLVI (Sirukambúr)
	XLV (Sembalavayal)	10 2 28·94	78 57 48·11	2 4 46·96	4·6819414,4	182 4 43·94	XLVII (Manikamkota)
	XLVI (Sirukambúr)	9 52 26·47	79 3 28·83	109 30 49·31	4·5795052,2	289 29 47·78	" "
	" "	"	"	42 18 59·69	4·7042421,4	222 18 1·55	XLVIII (Manĕgandi)
	" "	"	"	4 28 56·95	4·7093906,1	184 28 50·14	XLIX (Nambudalai)
139	XLVII (Manikamkota)	9 54 32·27	78 57 30·65	358 0 53·34	4·7001671,3	178 0 56·31	XLVIII (Manĕgandi)
"	" "	"	"	47 27 52·32	4·7015694,8	227 26 48·82	L (Vĕnniyúr)
140	XLVIII (Manĕgandi)	9 46 15·13	78 57 48·02	294 22 27·46	4·5187301,1	114 23 18·41	XLIX (Nambudalai)
"	" "	"	"	112 32 22·36	4·6233487,6	292 31 16·33	L (Vĕnniyúr)
"	" "	"	"	1 38 10·34	4·7328922,8	181 38 7·74	LI (Ūrannankudi)
"	" "	"	"	48 44 14·89	4·7426432,5	228 43 4·72	LII (Mutupatnam)
	XLIX (Nambudalai)	9 43 59·91	79 2 48·80	38 3 4·46	4·7102222,4	218 2 11·30	LI (Ūrannankudi)
	L (Vĕnniyúr)	9 48 54·83	78 51 19·87	2 59 14·91	4·7213125,6	182 59 10·27	LII (Mutupatnam)
	LI (Ūrannankudi)	9 37 18·98	78 57 32·59	113 42 38·55	4·6405499,4	293 41 31·50	" "
	" "	"	"	42 34 49·24	4·7748190,6	222 33 42·36	LIII (Kŏdikulam)
	" "	"	"	12 27 3·71	4·6727928,5	192 26 46·86	LIV (Pŏragudi)
141	LII (Mutupatnam)	9 40 13·29	78 50 52·44	0 13 58·80	4·7882956,4	180 13 58·39	LIII (Kŏdikulam)
"	" "	"	"	39 16 43·72	4·7861130,3	219 15 39·20	LV (Náyanárkoil)
142	LIII (Kŏdikulam)	9 30 3·94	78 50 49·94	274 0 59·87	4·4801839,3	94 1 49·57	LIV (Pŏragudi)
"	" "	"	"	110 9 42·33	4·6122313,3	290 8 38·78	LV (Náyanárkoil)
"	" "	"	"	353 40 35·31	4·6980145,1	173 40 44·31	LVI (Ramnad)
"	" "	"	"	42 29 6·53	4·7469362,4	222 28 4·70	LVII (Sambuttiyendal)
	LIV (Pŏragudi)	9 29 42·91	78 55 51·15	27 26 55·51	4·7282370,6	207 26 15·16	LVI (Ramnad)
	LV (Náyanárkoil)	9 32 23·91	78 44 25·72	359 13 51·45	4·7426998,1	179 13 52·67	LVII (Sambuttiyendal)
	LVI (Ramnad)	9 21 51·96	78 51 44·84	101 0 51·11	4·6436396,2	280 59 40·78	" "
	" "	"	"	57 58 2·59	4·5396758,5	237 57 14·97	LVIII (Uttarakoshamangai)
	" "	"	"	4 36 13·95	4·6347742,5	184 36 8·36	LIX (Kánjarangudi)
143	LVII (Sambuttiyendal)	9 23 15·33	78 44 33·14	332 39 51·04	4·4792759,5	152 40 13·51	LVIII (Uttarakoshamangai)
"	" "	"	"	52 34 22·96	4·6395687,0	232 33 26·76	LXII (Arapoth)
	LVIII (Uttarakoshamangai)	9 18 49·60	78 46 51·43	313 30 55·98	4·5531237,2	133 31 37·71	LIX (Kánjarangudi)
	" "	"	"	5 40 40·01	4·5127302,8	185 40 34·82	LX (Yervádi)
	" "	"	"	48 52 55·05	4·7236948,6	228 51 50·93	LXI (Tanichanthai)
	" "	"	"	90 20 11·85	4·6855270,1	270 18 53·48	LXII (Arapoth)
	LIX (Kánjarangudi)	9 14 45·43	78 51 10·27	75 1 53·60	4·4794750,5	255 1 6·89	LX (Yervádi)
	LX (Yervádi)	9 13 28·10	78 46 19·26	86 14 50·00	4·5650394,7	266 13 51·35	LXI (Tanichanthai)
	LXI (Tanichanthai)	9 13 4·19	78 40 13·23	166 12 39·17	4·5578709,4	346 12 25·32	LXII (Arapoth)
	" "	"	"	92 13 57·27	4·6764643,4	272 12 41·36	LXIII (Kadaládi)

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	LXI (Tanichanthai)	9 13 4·19	78 40 13·23	53 25 49·89	4·6958404,0	233 24 46·41	LXIV (Ŏpilán)
144	LXII (Arapoth)	9 18 52·33	78 38 47·21	49 25 47·31	4·7085216,5	229 24 44·86	LXIII (Kadaládi)
„	„ „	„	„	84 12 7·24	4·7216095,9	264 10 42·58	LXV (Kidátirukai)
	LXIII (Kadaládi)	9 13 22·46	78 32 19·48	346 26 3·49	4·5095301,7	166 26 15·57	LXIV (Ŏpilán)
	„ „	„	„	154 2 36·96	4·4920408,4	334 2 15·11	LXV (Kidátirukai)
	„ „	„	„	57 0 44·57	4·6566115,7	236 59 43·92	LXVI (Taraigudi)
	„ „	„	„	96 27 20·41	4·6393199,1	276 26 11·04	LXVII (Pulápati)
	LXIV (Ŏpilán)	9 8 10·69	78 33 35·18	98 23 37·78	4·6638673,1	278 22 25·38	LXVI (Taraigudi)
145	LXV (Kidátirukai)	9 17 59·43	78 30 3·73	52 14 9·49	4·5750515,1	232 13 21·69	LXVII (Pulápati)
	LXVI (Taraigudi)	9 9 17·41	78 25 59·64	169 53 43·16	4·4779605,7	349 53 34·74	„ „
	„ „	„	„	112 55 7·37	4·5769156,9	292 54 12·01	LXVIII (Annapúnáyakanpati)
	„ „	„	„	50 33 28·84	4·4957216,9	230 32 50·54	LXIX (Súrangudi)
146	LXVII (Pulápati)	9 14 11·00	78 25 6·97	63 12 39·47	4·5190659,3	243 11 52·30	LXVIII (Annapúnáyakanpati)
„	„ „	„	„	117 54 16·41	4·6167447,7	297 53 17·62	LXX (Mutúruni)
147	LXVIII (Annapúnáyakanpati)	9 11 43·21	78 20 12·43	342 58 1·27	4·5584408,5	162 58 18·09	LXIX (Súrangudi)
„	„ „	„	„	168 19 36·44	4·5437929,7	348 19 25·09	LXX (Mutúruni)
„	„ „	„	„	68 24 43·86	4·6296490,6	248 23 40·77	LXXI (Mŏtúruni)
„	„ „	„	„	108 56 10·39	4·6658602,5	288 55 0·30	LXXII (Melakalúruni)
	LXIX (Súrangudi)	9 6 0·01	78 21 58·23	110 37 57·06	4·7297469,0	290 36 37·52	LXXI (Mŏtúruni)
	LXX (Mutúruni)	9 17 23·07	78 19 1·75	62 23 6·28	4·6177160,3	242 22 7·21	LXXII (Melakalúruni)
	LXXI (Mŏtúruni)	9 9 7·56	78 13 36·71	172 13 1·62	4·4913802,1	352 12 54·92	„ „
	„ „	„	„	52 9 22·55	4·6768618,6	232 8 23·23	LXXIII (Supalápuram)
	„ „	„	„	105 29 39·73	4·8862753,1	285 27 41·57	LXXIV (Mínákshi)
148	LXXII (Melakalúruni)	9 14 12·31	78 12 54·78	29 6 3·86	4·8358141,9	209 5 10·93	LXXIII (Supalápuram)
„	„ „	„	„	81 44 21·28	4·8494181,5	261 42 29·30	LXXIV (Mínákshi)
	LXXIII (Supalápuram)	9 4 18·26	78 7 22·12	143 35 30·86	4·7906824,4	323 34 32·71	„ „
	„ „	„	„	112 2 4·31	4·9373969,2	291 59 57·35	LXXXIII (Koilpati)
	„ „	„	„	34 2 39·06	4·8070081,8	214 1 43·03	LXXXV (Kulayanallúr)
149	LXXIV (Mínákshi)	9 12 31·34	78 1 16·09	68 25 44·41	4·6709497,3	248 24 34·94	LXXXIII (Koilpati)
„	„ „	„	„	359 33 44·27	5·0121492,9	179 33 45·50	LXXXV (Kulayanallúr)
150	LXXXIII (Koilpati)	9 9 40·27	77 54 0·82	332 34 36·60	4·9841659,6	152 35 46·25	„ „
	LXXXV (Kulayanallúr)	8 55 31·05	78 1 23·92				

NOTE.—Stations LXXXIII (Koilpati) and LXXXV (Kulayanallúr) appertain to the Great Arc Meridional Series, Section 8° to 18°.

January, 1888.

M. W. ROGERS,
In charge of Computing Office.

CEYLON BRANCH SERIES OF THE SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

Station A				Side A B			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	LIX (Kánjarangudi)	9 14 45·43	78 51 10·27	75 1 53·60	4·4794750,5	255 1 6·89	LX (Yervádi)
	„ „	„	„	32 32 52·46	4·5932550,2	212 32 18·80	LXXV (Púvarasanhalli Tívu)
	„ „	„	„	348 4 32·15	4·4831709,4	168 4 42·19	LXXVI (Appa Tívu)
	„ „	„	„	267 8 12·09	4·5476537,7	87 9 8·66	LXXVII (Pĕriyapatnam)
	„ „	„	„	294 36 14·03	4·7193501,8	114 37 30·22	LXXVIII (Válai Tívu)
	LX (Yervádi)	9 13 28·10	78 46 19·26	342 18 6·10	4·4232913,7	162 18 18·94	LXXV (Púvarasanhalli Tívu)
	„ „	„	„	301 47 51·85	4·6199974,1	121 48 48·38	LXXVI (Appa Tívu)
	LXXV (Púvarasanhalli Tívu)	9 9 17·59	78 47 39·71	263 9 53·90	4·4404248,2	83 10 37·41	„ „
	LXXVI (Appa Tívu)	9 9 50·12	78 52 13·03	222 34 22·91	4·6315431,1	42 35 9·19	LXXVII (Pĕriyapatnam)
	„ „	„	„	259 7 33·99	4·6244425,8	79 8 39·84	LXXVIII (Válai Tívu)
	LXXVII (Pĕriyapatnam)	9 15 2·87	78 57 2·28	332 16 48·98	4·4255512,6	152 17 8·80	„ „
	„ „	„	„	263 49 34·56	4·7417985,2	83 51 2·72	LXXIX (Rámaswámi Madam)
	„ „	„	„	285 27 1·63	4·7789905,8	105 28 34·43	LXXX (Musal Tívu)
	LXXVIII (Válai Tívu)	9 11 8·88	78 59 6·02	235 12 18·27	4·7136637,6	55 13 26·29	LXXIX (Rámaswámi Madam)
	„ „	„	„	260 34 19·65	4·6644162,7	80 35 32·35	LXXX (Musal Tívu)
	LXXIX (Rámaswámi Madam)	9 16 1·64	79 6 10·23	352 1 59·17	4·3456662,5	172 2 4·09	„ „
	„ „	„	„	263 31 5·84	4·3971065,8	83 31 45·73	LXXXI (Marakayárpatnam)
	„ „	„	„	282 28 29·09	4·6413083,3	102 29 37·75	LXXXII (Púmurichán)
	LXXX (Musal Tívu)	9 12 23·84	79 6 40·91	221 15 3·92	4·5177590,0	41 15 38·75	LXXXI (Marakayárpatnam)
	„ „	„	„	252 31 24·90	4·6190722,3	72 32 28·42	LXXXII (Púmurichán)
	LXXXI (Marakayárpatnam)	9 16 29·56	79 10 17·86	304 21 54·66	4·3374832,8	124 22 23·51	„ „
	„ „	„	„	261 24 11·14	4·8066318,6	81 25 53·27	LXXXIII (Gandhamána)
	„ „	„	„	253 59 40·51	4·8323047,8	74 1 25·98	LXXXIV (Pisásu Mundal)
	LXXXII (Púmurichán)	9 14 27·73	79 13 17·18	244 17 56·36	4·7022517,1	64 19 9·42	LXXXIII (Gandhamána)
	„ „	„	„	260 34 41·30	4·7033256,5	80 36 1·31	LXXXV (Masánam Karail)

Station A				Side A B			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	LXXXIII (Gandhamána)	9 18 4·42	79 20 50·62	192 15 34·10	3·9720515,3	12 15 37·32	LXXXIV (Pisásu Mundal)
	" "	"	"	341 57 48·73	4·1548521,1	161 57 55·85	LXXXV (Masánam Karai)
	" "	"	"	247 20 7·16	4·9304749,0	67 22 14·74	LXXXVI (Kachi Tívu, N.)
	" "	"	"	249 54 6·66	4·9344186,8	69 56 17·62	LXXXVII (Kachi Tívu, S.)
	LXXXIV (Pisásu Mundal)	9 19 35·33	79 21 10·51	252 50 11·50	4·9042183,3	72 52 16·01	LXXXVI (Kachi Tívu, N.)
	LXXXV (Masánam Karai)	9 15 49·66	79 21 34·79	240 31 58·04	4·9428413,4	60 34 1·58	LXXXVII (Kachi Tívu, S.)
	LXXXVI (Kachi Tívu, N.)	9 23 29·94	79 33 56·21	327 11 45·49	3·5923797,8	147 11 48·95	" "
	" "	"	"	219 26 31·92	4·8775777,8	39 27 50·76	LXXXVIII (Ámanakamunai)
	" "	"	"	247 13 2·89	4·8854886,3	67 14 58·90	LXXXIX (Úrimunai)
	LXXXVII (Kachi Tívu, S.)	9 22 57·32	79 34 17·39	216 39 35·14	4·8849040,9	36 40 50·45	LXXXVIII (Ámanakamunai)
	" "	"	"	244 19 19·99	4·8821782,1	64 21 12·47	LXXXIX (Úrimunai)
	LXXXVIII (Ámanakamunai)	9 33 7·84	79 41 55·26	321 14 31·45	4·5631194,9	141 15 9·26	" "
	LXXXIX (Úrimunai)	9 28 24·89	79 45 44·06				

January, 1888.

M. W. ROGERS,
In charge of Computing Office.

SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.

The following table gives, first, the usual data of the observed vertical angles and the heights of the signal and instrument, &c., in pairs of horizontal lines, the first line of which gives the data for the 1st or the fixed station, and the second line the data for the 2nd or the deduced station. This is followed by the arc contained between the two stations, and then by the terrestrial refraction and the height of the 2nd station above or below the 1st, as computed from the vertical angles in the usual manner. This difference of height applied to the given height above mean sea level of the fixed station, gives that of the deduced station. Usually there are two or three independent values of the height of the deduced station; the details are so arranged as to show these consecutively and their mean in the columns of "Trigonometrical Results." The mean results thus obtained are however liable to receive corrections for the errors generated in the trigonometrical operations, which are shown up by the spirit levelling operations, wherever a junction between the two has been effected. The spirit levelled determinations are always accepted as final, and the trigonometrical heights of stations lying between those fixed by the levelling operations are adjusted by simple proportion to accord with the latter. In the table the spirit levelled values are printed thus, **202·69**, &c., to distinguish them from the adjusted trigonometrical values. The column in which the mean trigonometrical heights are given is barred across where necessary, as after deduction of Stn. VII from Stn. VI, page 134—F, to indicate that one set of adjustments ends and another begins. The trigonometrical heights always refer to the upper mark or to the upper surface of the pillar or structure on which the theodolite stood*; when a spirit levelled height does not refer to either of these surfaces, it is given in combination with a correction, thus $\left\{\begin{matrix}202·69\\-3·5\end{matrix}\right.$, and the sum of these two quantities, in this case 199·19, represents the value with which the corresponding trigonometrical mean height 202·0 is comparable. Descriptions follow these tables, exactly indicating the surfaces on which the levelling staff stood during the determinations of the spirit levelled heights.

When the pillar of the station is perforated, the height given in the last column is that between the upper surface of pillar and the ground level mark-stone in the floor of the passage; otherwise, it is the approximate height of the structure above the ground at the base of the station.

The heights of the initial stations above Mean Sea Level are taken from the Madras Longitudinal Series and are as follows :—

XXXIV (Mávandúr) 429·8 feet; XXXIX (Avirimodu) 490·4 feet.

Astronomical Date 1879-80	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Jan. 4,5	2 16	XXXIV (Mávandúr)	D 0 1 43·0	8	5·9	5·2	1017	59	·058	+172·0	601·8			
Dec. 29,30,31	2 16	I (Pŏnnúr)	D 0 13 19·9	12	2·5	5·2						602·1	602	3·0
Jan. 9,10	2 25	XXXIX (Avirimodu)	D 0 7 4·9	8	5·9	5·2	1369	93	·068	+111·9	602·3			
Dec. 29,30,31	2 24	I (Pŏnnúr)	D 0 12 43·2	12	2·5	5·2								

* In the case of Trestle Stations the theodolite stood on the trestle and not on the pillar; the heights however are referred to the pillar.
NOTE.—In no case does the trigonometrical height refer to the summit of the rectangular protecting pillar.

Astronomical Date 1879-80	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Jan. 4,5	2 5	XXXIV (Mávandúr)	D 0 0 37·3	8	2·5	5·2	1078	72	·067	+229·8	659·6	658·6	658	3·0
Dec. 6,7,8	2 6	II (Kaniyanúr)	D 0 15 6·9	12	2·5	5·2								
„ 29,30,31	2 15	I (Pŏnnúr)	D 0 7 1·4	12	2·5	5·2	1183	80	·068	+ 55·4	657·5			
„ 6,7,8	2 19	II (Kaniyanúr)	D 0 10 12·4	12	2·5	5·2								
„ 29,30,31	2 10	I (Pŏnnúr)	E 0 7 48·2	12	2·4	5·2	902	65	·072	+380·4	982·5	982·3	981	3·2
„ 10,11	2 10	III (Narasingapuram)	D 0 20 52·7	8	2·5	5·2								
„ 6,7,8	2 29	II (Kaniyanúr)	E 0 3 38·4	12	2·3	5·2	1010	77	·076	+323·5	982·1			
„ 10,11	2 30	III (Narasingapuram)	D 0 18 6·9	8	2·5	5·2								
Jan. 9,10	2 20	XXXIX (Avirimodu)	D 0 9 3·2	8	6·0	5·2	1106	72	·065	− 34·3	456·1	453·7	452	18
Dec. 24,25	2 21	IV (Pĕrumukkal)	D 0 7 3·4	8	2·5	5·2								
„ 29,30,31	2 14	I (Pŏnnúr)	D 0 13 18·4	12	6·0	5·2	1306	87	·067	−149·4	452·7			
„ 24,25	2 11	IV (Pĕrumukkal)	D 0 5 37·7	8	2·5	5·2								
1879 Mar. 26,27,28	2 4	V (Gingee)	D 0 24 11·8	12	2·7	5·2	1217	94	·077	−556·5	452·2			
„ 20,22	2 3	IV (Pĕrumukkal)	E 0 6 54·1	6	2·6	5·2								
Dec. 29,30,31	1 45	I (Pŏnnúr)	E 0 6 32·9	12	2·6	5·2	1000	69	·069	+406·5	1008·6	1009·4	1007	25·7
Mar. 26,27,28	1 42	V (Gingee)	D 0 21 5·5	12	2·5	5·2								
Dec. 10,11	2 30	III (Narasingapuram)	D 0 6 44·8	8	2·7	5·2	1064	82	·077	+ 26·5	1008·8			
Mar. 26,27,28	2 29	V (Gingee)	D 0 8 26·9	12	2·3	5·2								
„ 20,22	2 3	IV (Pĕrumukkal)	E 0 6 54·1	6	2·6	5·2	1217	94	·077	+556·5	1010·9			
„ 26,27,28	2 4	V (Gingee)	D 0 24 11·8	12	2·7	5·2								
„ 21,22,23	1 42	IV (Pĕrumukkal)	D 0 14 55·9	12	30·8	5·2	1067	70	·066	−251·5	202·2*	202·0	202·69 −3·5	11·0
„ 11,12,13,14	1 38	VI (Kallapat)	D 0 0 33·7	16	2·5	29·0								
„ 26,27,28	2 19	V (Gingee)	D 0 30 37·2	12	30·7	5·2	1215	83	·068	−807·6	201·8			
„ 11,12,13,14	2 19	VI (Kallapat)	E 0 13 5·6	16	2·6	29·0								
„ 22,23	1 54	IV (Pĕrumukkal)	D 0 14 21·6	8	6·0	5·2	1520	89	·059	−142·3	311·4*	305·0	302	1·7
„ 6,7,8	1 38	VII (Mallipat)	D 0 8 4·5	12	2·5	5·2								
„ 27,28	1 58	V (Gingee)	D 0 30 53·2	8	6·0	5·2	1014	71	·070	−705·8	303·6			
„ 6,7,8	1 59	VII (Mallipat)	E 0 16 17·3	12	2·6	5·2								
„ 11,12,13,14	2 0	VI (Kallapat)	D 0 0 45·8	16	6·0	29·0	668	40	·060	+104·4	306·4			
„ 6,7,8	1 49	VII (Mallipat)	D 0 8 53·6	12	31·1	5·2								
„ 11,12,13,14	1 57	VI (Kallapat)	D 0 4 56·5	12	38·5	29·0	1057	57	·054	+ 81·7	280·9	279·1	279	3·0
Feb. 24,25,26	1 46	VIII (Chĕndamangalam)	D 0 10 27·8	12	31·1	29·8								
Mar. 6,7,8	2 21	VII (Mallipat)	D 0 6 2·1	12	38·4	5·2	857	47	·055	− 25·0	277·2			
Feb. 24,25,26	2 20	VIII (Chĕndamangalam)	D 0 6 27·1	12	2·5	29·8								
Mar. 6,7,8	2 1	VII (Mallipat)	D 0 3 53·1	12	6·0	5·2	759	41	·054	+ 38·7	340·9	341·5	342	3·0
„ 2,3	2 0	IX (Kiliyúr)	D 0 7 30·0	8	2·5	5·2								

* Rejected.

Astronomical Date 1879	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Feb. 24,25,26	2 13	VIII (Chěndamangalam)	D 0 1 9·1	12	2·6	29·8	509	43	·084	+ 62·9	342·0			
Mar. 1,2,3	2 12	IX (Kiliyúr)	D 0 5 31·7	12	38·4	5·2								
„ 11,12,13,14	1 41	VI (Kallapat)	D 0 4 14·8	14	30·4	29·0	1078	61	·057	+116·7	315·9			
Feb. 13	1 33	X (Vallam)	D 0 11 35·2	4	31·0	29·0						316·5	317	11·0
„ 24,25,26	2 6	VIII (Chěndamangalam)	D 0 2 8·1	12	30·5	29·8	584	29	·050	+ 38·0	317·1			
„ 13	2 6	X (Vallam)	D 0 6 2·4	8	38·6	29·0								
„ 24,25	1 52	VIII (Chěndamangalam)	D 0 5 21·4	8	6·0	29·8	371	26	·070	− 5·4	273·7			
„ 19,21	1 50	XI (Ulundúrpet)	E 0 0 54·5	8	38·9	5·2						273·9	274	11·0
Mar. 1,2,3	2 37	IX (Kiliyúr)	D 0 8 18·5	12	5·9	5·2	459	28	·061	− 67·5	274·0			
Feb. 20,21	2 36	XI (Ulundúrpet)	E 0 1 25·9	8	2·6	5·2								
„ 24,25,26	2 0	VIII (Chěndamangalam)	E 0 3 9·0	12	32·0	29·8	398	30	·075	+ 67·8	346·9			
„ 16,17	1 55	XII (Koilánkuppam)	D 0 7 47·6	8	38·6	29·0								
„ 13	1 42	X (Vallam)	D 0 0 41·8	4	31·3	29·0	442	23	·052	+ 31·7	348·2	347·2	348	11·0
„ 16,17	1 42	XII (Koilánkuppam)	D 0 5 36·0	8	30·8	29·0								
„ 19,21	2 22	XI (Ulundúrpet)	E 0 3 56·0	8	32·1	5·2	461	27	·059	+ 72·5	346·4			
„ 16,17	2 20	XII (Koilánkuppam)	D 0 10 28·6	8	5·6	29·0								
„ 13	2 7	X (Vallam)	D 0 15 33·7	4	37·8	29·0	408	25	·061	−159·8	156·7			
„ 8,9,10	2 7	XIII (Seppalánattam)	E 0 10 29·3	12	31·2	29·0								
„ 16,17	2 19	XII (Koilánkuppam)	D 0 16 17·7	8	37·7	29·0	511	21	·041	−194·5	152·7	154·0	155	11·0
„ 8,9,10	2 18	XIII (Seppalánattam)	E 0 9 11·2	12	31·5	29·0								
„ 4,5	1 42	XIV (Kánádakŏndán)	D 0 10 28·9	8	36·8	28·8	586	25	·043	−111·8	152·5			
„ 8,9,10	1 44	XIII (Seppalánattam)	E 0 2 23·1	12	35·2	29·0								
„ 19,20,21	2 27	XI (Ulundúrpet)	D 0 2 26·2	12	35·6	5·2	508	25	·049	− 9·7	264·2			
„ 4,5	2 7	XIV Kánádakŏndán)	D 0 4 44·3	8	5·5	28·8								
„ 16,17	2 27	XII (Koilánkuppam)	D 0 11 13·9	8	35·6	29·0	290	6	·021	− 82·8	264·4	265·0	266	11·0
„ 4,5	2 25	XIV (Kánádakŏndán)	E 0 7 43·4	8	31·8	28·8								
„ 8,9,10	1 44	XIII (Seppalánattam)	E 0 2 23·1	12	35·2	29·0	586	25	·043	+111·8	266·5			
„ 4,5	1 42	XIV (Kánádakŏndán)	D 0 10 28·9	8	36·8	28·8								
„ 8,9,10	1 59	XIII (Seppalánattam)	D 0 9 22·9	12	31·4	29·0	667	26	·039	− 85·5	68·5			
Jan. 25,26	1 53	XV (Pŏdaiyúr)	D 0 0 29·4	8	36·9	31·2								
Feb. 5	2 46	XIV (Kánádakŏndán)	D 0 14 24·4	8	31·3	28·8	906	22	·024	−195·3	69·7	67·8	69	11·0
Jan. 25,26	2 24	XV (Pŏdaiyúr)	E 0 0 19·4	8	35·5	31·2								
„ 29,30	2 5	XVI (Ayyampet)	D 0 17 2·4	8	31·4	29·4	374	8	·021	−156·4	65·1			
„ 25,26	2 3	XV (Pŏdaiyúr)	E 0 11 33·5	8	34·7	31·2								
Feb. 8,9	1 42	XIII (Seppalánattam)	D 0 2 3·9	8	36·5	29·0	749	46	·061	+ 67·7	221·7			
Jan. 29,30	1 39	XVI (Ayyampet)	D 0 8 11·9	8	37·0	29·4								

Astronomical Date 1878-79	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Feb. 4,5	2 3	XIV (Kánádakŏndán)	D 0 7 3·2	8	37·0	28·8								
Jan. 29,30	1 56	XVI (Ayyampet)	D 0 2 56·2	6	35·6	29·4	706	32	·045	− 43·8	221·2	222·8	224	11·2
„ 25,26	2 3	XV (Pŏdaiyúr)	E 0 11 33·5	8	34·7	31·2								
„ 29,30	2 5	XVI (Ayyampet)	D 0 17 2·4	8	31·4	29·4	374	8	·021	+156·4	225·5			
„ 25,26	2 3	XV (Pŏdaiyúr)	E 0 2 13·7	8	47·4	31·2								
„ 14,15,16,17	2 1	XVII (Salpai)	D 0 8 59·2	16	31·4	29·4	472	− 6	·013	+ 70·8	138·6			
„ 29,30	2 24	XVI (Ayyampet)	D 0 8 48·8	8	47·5	29·4						137·2	138	11·1
„ 14,15,16,17	2 24	XVII (Salpai)	E 0 3 55·1	16	34·7	29·4	430	13	·030	− 87·0	135·8			
„ 25,26	1 54	XV (Pŏdaiyúr)	D 0 4 16·3	8	49·8	31·2								
„ 20,21,22	1 53	XVIII (Kuchúr)	D 0 2 52·8	12	31·4	27·9	504	− 8	·016	− 17·9	49·9			
„ 14,15,16,17	2 17	XVII (Salpai)	D 0 8 56·3	16	50·3	29·4						49·6	51	11·0
„ 20,21,22	2 27	XVIII (Kuchúr)	E 0 6 25·7	14	47·6	27·9	386	11	·028	− 87·9	49·3			
„ 29,30	1 54	XVI (Ayyampet)	D 0 1 54·5	6	33·4	29·4								
Dec. 27,28,29	1 52	XIX (Kulattúr)	D 0 3 59·6	12	34·8	29·1	393	5	·013	+ 13·0	235·8			
Jan. 14,15,16,17	2 1	XVII (Salpai)	E 0 5 44·0	16	34·3	29·4						236·8	238	10·0
Dec. 27,28,29	2 1	XIX (Kulattúr)	D 0 10 31·3	12	46·8	29·1	394	− 6	·015	+100·6	237·8			
Jan. 14,15,16,17	1 55	XVII (Salpai)	E 0 5 54·1	16	31·5	29·4								
„ 1,2	1 53	XX (Kachipĕrumál)	D 0 13 6·7	12	47·6	29·3	494	−11	·022	+146·3	283·5			
Dec. 27,28,29	1 38	XIX (Kulattúr)	E 0 2 19·5	12	30·6	29·1						282·0	283	11·1
Jan. 1,2,	2 1	XX (Kachipĕrumál)	D 0 6 55·1	8	34·1	29·3	308	− 5	·016	+ 43·6	280·4			
„ 14,15,16,17	2 53	XVII (Salpai)	D 0 7 14·0	14	26·8	29·4								
1878 Mar. 25,26	2 54	XXI (Tirupanandál Mandap)	D 0 1 18·3	8	39·8	27·2	564	8	·014	− 41·6	95·6			
1879 Jan. 20,22	2 18	XVIII (Kuchúr)	D 0 2 5·8	6	26·8	27·9								
1878 Mar. 25,26	2 17	XXI (Tirupanandál Mandap)	D 0 5 52·3	8	49·2	27·2	566	6	·011	+ 43·1	92·7	94·3	96	32
„ 21,22	2 31	XXII (Nayinipiriyán)	D 0 7 52·2	8	32·6	25·1								
„ 25,26	2 31	XXI (Tirupanandál Mandap)	E 0 3 39·9	8	47·3	27·2	404	6	·015	− 62·1	94·5			
1879 Jan. 14,15,16,17	1 57	XVII (Salpai)	D 0 2 20·9	16	51·1	29·4								
„ 7,8,9,10	1 56	XXII (Nayinipiriyán)	D 0 5 19·1	22	47·5	31·8	539	−31	·058	+ 20·5	157·7			
„ 1,2	2 14	XX (Kachipĕrumál)	D 0 15 5·3	8	50·7	29·3								
„ 8,9,10	2 14	XXII (Nayinipiriyán)	E 0 12 29·1	12	31·2	31·8	285	− 9	·032	−126·6	155·4	156·5	158	10·0
1878 Mar. 25,26	2 31	XXI (Tirupanandál Mandap)	E 0 3 39·9	8	47·3	27·2								
„ 21,22	2 31	XXII (Nayinipiriyán)	D 0 7 52·2	8	32·6	25·1	404	6	·015	+ 62·1	156·3			
„ 25,26	2 16	XXI (Tirupanandál Mandap)	D 0 0 20·7	8	39·5	27·2								
„ 11,12,13,14	2 16	XXIII (Kumbakonam)	D 0 6 35·4	16	26·2	22·2	504	11	·022	+ 42·2	136·5			
„ 21,22	2 45	XXII (Nayinipiriyán)	D 0 5 4·1	8	39·5	25·1						136·3	91·20 +46·78	51
„ 11,12,13,14	2 45	XXIII (Kumbakonam)	D 0 2 6·2	16	47·7	22·2	593	13	·022	− 20·4	136·1			

Astronomical Date 1878	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Mar. 25,26	2 41	XXI (Tirupanandál Mandap)	D 0 4 45.7	8	50.3	27.2	549	−18	.033	− 21.0	74.8			
„ 29,30	2 51	XXIV (Putagaram)	D 0 3 34.7	8	31.8	31.6								
„ 11,12,13,14	2 23	XXIII (Kumbakonam)	D 0 7 36.3	16	38.4	22.2	369	4	.011	− 66.2	71.8	73.3	73	11.2
„ 29,30	2 28	XXIV (Putagaram)	E 0 3 48.4	8	39.5	31.6								
„ 21,22	2 10	XXII (Nayinipiriyán)	E 0 0 24.4	8	28.1	25.1	441	−10	.023	+ 52.2	210.2			
„ 17,18	2 11	XXV (Mutuváncheri)	D 0 5 52.2	8	47.8	21.9								
„ 11,12,13,14	2 32	XXIII (Kumbakonam)	E 0 1 45.5	16	28.3	22.2	477	16	.034	+ 70.6	208.6	209.4	209	11.0
„ 17,18	2 37	XXV (Mutuváncheri)	D 0 7 29.0	8	39.5	21.9								
„ 11,12,13,14	2 57	XXIII (Kumbakonam)	D 0 6 9.2	16	42.4	22.2	499	8	.016	− 51.2	86.8			
„ 2,3,4	2 57	XXVI (Álangudi)	E 0 0 10.5	12	39.7	28.9								
„ 29,30	2 33	XXIV (Putagaram)	D 0 2 25.7	8	42.8	31.6	485	−10	.021	+ 14.3	87.6	87.6	87	10.0
„ 2,3,4	2 39	XXVI (Álangudi)	D 0 4 35.6	16	37.9	28.9								
„ 7,8	2 42	XXVII (Víramangalam)	D 0 3 28.8	8	42.5	28.9	368	2	.005	− 18.6	88.5			
„ 2,3,4	2 42	XXVI (Álangudi)	D 0 0 22.3	12	39.0	28.9								
„ 11,12,13,14	2 5	XXIII (Kumbakonam)	D 0 4 52.4	16	38.3	22.2	438	0	0	− 32.0	106.0			
„ 7,8	2 4	XXVII (Víramangalam)	D 0 0 19.5	8	39.7	28.9								
„ 17,18	3 8	XXV (Mutuváncheri)	D 0 9 36.2	8	38.2	21.9	608	13	.021	−101.3	108.1	106.6	106	10.0
„ 7,8	2 51	XXVII (Víramangalam)	E 0 0 46.4	8	28.2	28.9								
„ 2,3,4	2 42	XXVI (Álangudi)	D 0 0 22.3	12	39.0	28.9	368	2	.005	+ 18.6	105.8			
„ 7,8	2 42	XXVII (Víramangalam)	D 0 3 28.8	8	42.5	28.9								
„ 2,3,4	2 22	XXVI (Álangudi)	D 0 1 16.3	12	45.4	28.9	518	− 1	.002	+ 30.3	117.9			
Feb. 24,25,26	2 23	XXVIII (Arasapat)	D 0 5 28.0	12	42.1	29.0						118.4	118	10.0
Mar. 7,8	2 31	XXVII (Víramangalam)	D 0 2 39.0	8	45.4	28.9	528	− 6	.011	+ 12.2	118.8			
Feb. 24,25,26	2 32	XXVIII (Arasapat)	D 0 4 39.9	12	38.5	29.0								
Mar. 2,3,4	2 18	XXVI (Álangudi)	D 0 3 29.1	12	43.9	28.9	493	1	.002	− 6.2	81.4			
Feb. 21	2 38	XXIX (Parutikota)	D 0 2 43.9	8	42.8	29.1						82.4	82	10.0
„ 24,25,26	3 0	XXVIII (Arasapat)	D 0 4 48.1	12	43.8	29.0	379	10	.026	− 35.0	83.4			
„ 21	2 58	XXIX (Parutikota)	E 0 1 40.5	8	46.2	29.1								
Mar. 7,8	2 21	XXVII (Víramangalam)	D 0 0 15.0	8	42.8	28.9	513	9	.018	+ 44.7	151.3			
Feb. 10	2 22	XXX (Rárámutiraikota)	D 0 5 52.5	8	40.7	22.5						151.7	154.51 − 3.5*	10.0
„ 24,25,26	2 57	XXVIII (Arasapat)	E 0 1 32.8	12	43.2	29.0	365	8	.022	+ 33.7	152.1			
„ 10	2 57	XXX (Rárámutiraikota)	D 0 3 54.5	4	45.5	22.5								
„ 24,25,26	2 43	XXVIII (Arasapat)	D 0 5 2.8	12	33.5	29.0	539	2	.004	− 13.9	104.0			
„ 16,17	2 43	XXXI (Púvatúr)	D 0 2 6.3	8	46.0	22.7						104.7	105	8.9
„ 21	3 1	XXIX (Parutikota)	D 0 3 32.0	12	33.4	29.1	566	−29	.051	+ 23.6	105.3			
„ 16,17	2 31	XXXI (Púvatúr)	D 0 5 20.3	8	44.0	22.7								

* Assumed height of the rectangular protecting pillar above the circular pillar.

Astronomical Date 1878	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Feb. 24,25,26	2 11	XXVIII (Arasapat)	D 0 3 3·7	12	44·8	29·0	547	−31	·057	+ 16·6	134·5*			
„ 14	2 55	XXXII (Kakkrákota)	D 0 4 39·4	8	45·8	22·4								
„ 10	3 48	XXX (Rárámutiraikota)	D 0 4 40·2	4	40·6	22·5	580	−17	·029	− 10·4	140·6*			
„ 14	3 6	XXXII (Kakkrákota)	D 0 3 15·9	8	43·7	22·4								
1877														
Feb. 27,28, Mar. 1	3 12	XXXI (Púvatúr)	E 0 0 26·0	12	31·2	20·5	345	−15	·043	+ 25·4	130·1	130·1	120·74 +9·29	9·0
„ 23,24	3 9	XXXII (Kakkrákota)	D 0 4 2·6	8	36·4	20·4								
„ 27,28, Mar. 1	2 57	XXXI (Púvatúr)	D 0 1 38·6	12	45·0	30·5	503	− 9	·018	+ 15·3	120·0			
Mar. 10,13,15,19,20	2 58	XXXIII (Pátharankota)	D 0 4 54·2	20	36·5	29·6								
Feb. 23,24	3 16	XXXII (Kakkrákota)	D 0 3 14·9	8	44·9	20·4	491	−15	·031	− 8·7	121·3	120·7	120	0·9
Mar. 10,13,15,19,20	3 18	XXXIII (Pátharankota)	D 0 3 37·9	20	31·1	29·6								
Feb. 27,28, Mar. 1	3 27	XXXI (Púvatúr)	D 0 3 39·0	12	46·8	20·5	489	−15	·031	− 16·9	87·8			
Mar. 5,6	3 28	XXXIV (Patukota)	D 0 2 38·3	8	36·4	29·3								
„ 10,13,15,19,20	2 50	XXXIII (Pátharankota)	D 0 4 15·6	20	46·7	29·6	333	2	·006	− 31·8	88·9	88·4	88	1·0
„ 5,6	2 53	XXXIV (Patukota)	E 0 2 4·7	8	44·9	29·3								
Feb. 23,24	2 59	XXXII (Kakkrákota)	E 0 1 24·3	8	38·3	20·4	452	− 7	·015	+ 52·4	182·4			
„ 17,19,21	3 0	XXXV (Kallakota)	D 0 7 40·2	12	31·4	29·4								
Mar. 10,13,15,19,20	3 38	XXXIII (Pátharankota)	E 0 3 46·3	20	38·3	29·6	354	− 8	·023	+ 62·6	183·3	182·9	185·62 − 3·5	1
Feb. 17,19,20,21	3 38	XXXV (Kallakota)	D 0 7 33·5	16	45·3	29·4								
Mar. 10,13,15	3 24	XXXIII (Pátharankota)	D 0 4 34·3	12	45·3	29·6	457	− 7	·015	− 24·6	95·7			
Feb. 6,7,8	3 23	XXXVI (Kalúrunikád)	D 0 0 49·5	12	45·4	28·4								
Mar. 5,6	2 47	XXXIV (Patukota)	D 0 2 18·0	8	45·3	29·3	462	−11	·024	+ 7·5	95·1	94·9	95	1
Feb. 6,7,8	2 47	XXXVI (Kalúrunikád)	D 0 3 13·2	12	46·9	28·4								
„ 12,13,14,15	2 58	XXXVII (Kárakkurchi)	D 0 8 22·1	16	45·6	29·5	417	− 5	·012	− 75·3	93·8			
„ 6,7,8	2 59	XXXVI (Kalúrunikád)	E 0 3 34·4	12	40·4	28·4								
Mar. 10,13,15,19,20	3 8	XXXIII (Pátharankota)	E 0 0 6·1	20	40·3	29·6	481	− 6	·012	+ 48·8	169·1			
Feb. 12,13,14	3 7	XXXVII (Kárakkurchi)	D 0 6 25·7	12	45·4	29·5								
„ 17,19,20,21	2 49	XXXV (Kallakota)	D 0 4 1·6	16	40·4	29·4	472	3	·006	− 13·1	169·0	169·6	173·54 − 3·5	1·0
„ 12,13,14,15	2 49	XXXVII (Kárakkurchi)	D 0 2 18·0	16	38·3	29·5								
„ 6,7,8	2 59	XXXVI (Kalúrunikád)	E 0 3 34·4	12	40·4	28·4	417	− 5	·012	+ 75·3	170·7			
„ 12,13,14,15	2 58	XXXVII (Kárakkurchi)	D 0 8 22·1	16	45·6	29·5								
„ 6,7,8	3 32	XXXVI (Kalúrunikád)	D 0 3 11·9	12	37·1	28·4	498	−18	·036	+ 9·7	105·0			
Jan. 26,27,29	3 41	XXXVIII (Merpanaikád)	D 0 3 59·5	12	45·8	29·4								
Feb. 12,13,14,15	3 20	XXXVII (Kárakkurchi)	D 0 9 14·2	16	37·1	29·5	471	−73	·155	− 64·5	105·5	105·3	105	1·1
Jan. 26,27,29	3 19	XXXVIII (Merpanaikád)	E 0 0 22·1	12	41·0	29·4								
Feb. 6,7,8	3 12	XXXVI (Kalúrunikád)	D 0 7 32·7	12	33·9	28·4	462	−29	·063	− 49·2	46·1			
„ 1,2,3	3 13	XXXIX (Rĕtavayal)	E 0 0 33·0	12	45·6	28·5						47·3	48	1

* Rejected.

Astronomical Date 1876-77	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Jan. 26,27,29	2 48	XXXVIII (Merpanaikád)	D 0 8 21·1	12	33·4	29·4	360	−22	·061	− 56·9	48·4			
Feb. 1,2,3	2 50	XXXIX (Rĕtavayal)	E 0 2 49·8	12	37·2	28·5								
„ 12,13,14,15	3 30	XXXVII (Kárakkurchi)	D 0 3 37·6	16	41·0	29·5	450	−49	·109	+ 0·8	170·8			
Jan. 23,24	3 27	XL (Kulamangalam)	D 0 4 1·9	8	41·2	33·5								
„ 26,27,29	2 57	XXXVIII (Merpanaikád)	E 0 7 9·0	12	40·9	29·4	279	− 4	·014	+ 66·9	172·2	171·5	175·15 − 3·5	1·0
„ 23,24	3 0	XL (Kulamangalam)	D 0 10 1·6	8	37·5	33·5								
„ 26,27,29	3 5	XXXVIII (Merpanaikád)	D 0 5 35·3	12	37·0	29·4	472	−56	·119	− 17·7	87·7			
„ 13,15,16	3 7	XLI (Mánúr)	D 0 3 3·8	12	37·8	30·6								
Feb. 1,2,3	3 25	XXXIX (Rĕtavayal)	D 0 1 36·7	12	37·1	28·5	456	−60	·132	+ 34·2	81·7	84·2	84	1
Jan. 13,15,16	3 22	XLI (Mánúr)	D 0 7 8·1	12	33·6	30·6								
„ 18,19,20	2 51	XLII (Pallathivayal)	D 0 8 32·7	12	36·9	29·5	367	−19	·052	− 63·2	83·3			
„ 13,15,16	2 48	XLI (Mánúr)	E 0 3 34·4	12	42·3	30·6								
„ 26,27,29	3 30	XXXVIII (Merpanaikád)	E 0 1 4·0	12	57·3	29·4	480	1	·002	+ 43·5	148·9			
„ 18,19,20	3 26	XLII (Pallathivayal)	D 0 6 30·0	12	37·6	29·5								
„ 23,24	3 43	XL (Kulamangalam)	D 0 4 25·9	8	57·4	33·5	456	−21	·046	− 27·7	144·0			
„ 18,19,20	3 41	XLII (Pallathivayal)	D 0 1 18·6	12	40·1	29·5						146·9	150·11 − 3·5	0·7
„ 13,15,16	2 48	XLI (Mánúr)	E 0 3 34·4	12	42·3	30·6	367	−19	·052	+ 63·2	147·9			
„ 18,19,20	2 51	XLII (Pallathivayal)	D 0 8 32·7	12	36·9	29·5								
„ 13,15,16	3 41	XLI (Mánúr)	D 0 3 47·9	12	43·7	30·6	513	−51	·099	+ 6·7	90·6			
„ 2,3,4	3 46	XLIII (Ŏkkúr)	D 0 5 3·5	12	37·0	29·6						91·1	90	1
„ 18,19,20	3 5	XLII (Pallathivayal)	D 0 7 2·5	12	43·7	29·5	473	−10	·021	− 55·1	91·5			
„ 2,3,4,5	3 6	XLIII (Ŏkkúr)	E 0 0 48·2	16	42·7	29·6								
„ 13,15	4 56	XLI (Mánúr)	D 0 6 10·7	8	46·1	30·6	512	−25	·049	− 38·2	45·7			
„ 9,10	4 56	XLIV (Kánád)	D 0 1 20·9	8	37·1	25·1						44·3	44·73 − 3·5	1·1
„ 2,3,4,5	3 18	XLIII (Ŏkkúr)	D 0 6 26·5	16	45·7	29·6	428	−20	·047	− 48·3	42·8			
„ 9,10	3 19	XLIV (Kánád)	E 0 1 24·9	8	43·7	25·1								
„ 18,20	3 24	XLII (Pallathivayal)	D 0 5 35·6	8	40·5	29·5	523	−16	·031	− 25·8	120·8			
Dec. 29	3 25	XLV (Sembalavayal)	D 0 1 45·5	4	42·9	24·5						121·7	119	0·9
Jan. 2,3,4,5	3 11	XLIII (Ŏkkúr)	E 0 1 51·8	16	40·9	29·6	317	− 5	·016	+ 31·4	122·5			
Dec. 29,30	3 11	XLV (Sembalavayal)	D 0 3 59·7	8	44·0	24·5								
1877 Jan. 2,3,4,5	2 45	XLIII (Ŏkkúr)	D 0 6 26·9	16	51·9	29·6	531	−26	·049	− 47·3	42·3			
1876 Feb. 28,29	2 45	XLVI (Sirukambúr)	D 0 1 9·3	8	40·0	29·7								
1877 Jan. 9,10	2 46	XLIV (Kánád)	D 0 3 39·4	8	51·7	25·1	524	−62	·118	+ 0·2	41·4	41·9	42	1
1876 Feb. 28,29	2 56	XLVI (Sirukambúr)	D 0 4 20·7	8	46·0	29·7								
„ 25,26	2 34	XLVII (Manikamkota)	D 0 6 30·1	12	52·9	29·6	375	−26	·069	− 55·8	41·9			
„ 28,29	2 36	XLVI (Sirukambúr)	E 0 2 39·6	8	42·7	29·7								

Astronomical Date 1877	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Jan. 2,3,4,5 1876	2 55	XLIII (Òkkúr)	D 0 3 3·6	16	42·9	29·6	520	−12	·023	+ 9·3	98·9			
Feb. 25,26	2 55	XLVII (Manikamkota)	D 0 4 27·2	8	40·2	29·6								
Dec. 29,30	2 49	XLV (Sembalavayal)	D 0 4 31·2	8	43·0	24·5	476	−18	·038	− 22·1	96·5			
Feb. 25,26	2 44	XLVII (Manikamkota)	D 0 1 56·5	8	40·0	29·6						97·7	97	1
„ 28,29	2 36	XLVI (Sirukambúr)	E 0 2 39·6	8	42·7	29·7	375	−26	·069	+ 55·8	97·7			
„ 25,26	2 34	XLVII (Manikamkota)	D 0 6 30·1	12	52·9	29·6								
„ 28,29	2 30	XLVI (Sirukambúr)	D 0 3 36·4	8	44·8	29·7	501	−93	·186	+ 16·4	58·3			
„ 14,15,16,17	2 29	XLVIII (Manĕgandi)	D 0 4 47·7	16	52·8	22·6								
„ 25,26	3 14	XLVII (Manikamkota)	D 0 7 13·1	8	44·6	29·6	496	−75	·151	− 41·8	55·9	57·1	56	1
„ 14,15,16,17	3 18	XLVIII (Manĕgandi)	D 0 1 10·0	16	42·2	22·6								
„ 28.29	3 32	XLVI (Sirukambúr)	D 0 6 45·1	8	40·7	29·7	506	−86	·170	− 27·2	14·7			
„ 10,11	2 36	XLIX (Nambudalai)	D 0 2 3·7	8	52·5	26·2								
„ 14,15,16,17	2 17	XLVIII (Manĕgandi)	D 0 5 50·3	16	40·8	22·6	326	−35	·107	− 42·6	14·5	14·6	17·10 − 3·5	1
„ 10,11	2 13	XLIX (Nambudalai)	E 0 3 3·1	8	44·5	26·2								
„ 25	19 28	XLVII (Manikamkota)	D 0 2 52·1	4	47·8	29·6	498	−14	·028	+ 3·9	101·6			
„ 22	19 30	L (Vĕnniyúr)	D 0 2 51·1	4	50·5	24·4						99·0	98	1
„ 14,15,16,17	2 14	XLVIII (Manĕgandi)	D 0 0 21·2	16	38·2	22·6	416	−83	·200	+ 39·3	96·4			
„ 21,22	2 15	L (Vĕnniyúr)	D 0 6 24·6	8	44·6	24·4								
„ 14,15,16,17	2 41	XLVIII (Manĕgandi)	D 0 6 29·1	16	37·1	22·6	535	−45	·084	− 34·4	22·0			
Mar. 2,3,4	2 40	LI (Ŭrannankudi)	D 0 1 36·8	12	44·7	22·5								
Feb. 10,11	2 25	XLIX (Nambudalai)	D 0 3 31·6	8	37·1	26·2	508	−45	·089	+ 10·9	24·5	22·6	28·42 − 3·5*	†
Mar. 2,3,4	2 25	LI (Ŭrannankudi)	D 0 4 26·6	12	41·6	22·5								
„ 7,8,9	2 31	LII (Mutupatnam)	D 0 5 16·4	12	36·4	25·2	432	−42	·097	− 23·6	21·4			
„ 2,3,4	2 31	LI (Ŭrannankudi)	D 0 0 28·6	12	47·5	22·5								
Feb. 14,15,16,17	2 53	XLVIII (Manĕgandi)	D 0 5 4·3	16	47·7	22·6	547	−78	·143	− 12·4	44·0			
Mar. 7,8,9	2 53	LII (Mutupatnam)	D 0 3 53·5	12	44·5	25·2								
Feb. 21,22	2 42	L (Vĕnniyúr)	D 0 6 57·2	8	47·6	24·4	521	−43	·083	− 52·1	45·9	45·6	48	1·0
Mar. 7,8,9	2 42	LII (Mutupatnam)	D 0 0 11·6	12	47·8	25·2								
„ 2,3,4	2 31	LI (Ŭrannankudi)	D 0 0 28·6	12	47·5	22·5	432	−42	·097	+ 23·6	46·9			
„ 7,8,9	2 31	LII (Mutupatnam)	D 0 5 16·4	12	36·4	25·2								
„ 3,4	3 10	LI (Ŭrannankudi)	D 0 3 31·8	8	21·2	22·5	589	−59	·100	+ 42·3	67·2			
„ 13,14	2 31	LIII (Kŏdikulam)	D 0 6 29·5	8	37·1	5·2						66·3	68	25·8
„ 7,8,9	4 58	LII (Mutupatnam)	D 0 4 49·6	12	21·2	25·2	607	−31	·051	+ 17·5	65·4			
„ 13,14	4 56	LIII (Kŏdikulam)	D 0 4 12·8	8	47·3	5·2								
„ 2,3,4	2 57	LI (Ŭrannankudi)	D 0 5 14·9	12	28·6	22·5	466	−49	·105	− 13·5	11·4			
„ 17	2 57	LIV (Pŏragudi)	D 0 2 59·8	8	36·7	26·7						10·4	16·80 − 3·5*	0

* Assumed height of the rectangular protecting pillar above the circular pillar.
† See description of this station, page 16—F.

Astronomical Date 1876	Astronomical Date Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet Signal	Height in feet Instrument	Contained Arc	Terrestrial Refraction In seconds	Terrestrial Refraction Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level Trigonometrical Results By each deduction	Trigonometrical Results Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Mar. 13,14	2 29	LIII (Kŏdikulam)	D 0 6 25·5	8	28·8	5·2	299	− 8	·027	− 56·9	9·4			
" 17	2 28	LIV (Pŏragudi)	E 0 3 15·3	8	21·5	26·7								
" 7,8,9	5 4	LII (Mutupatnam)	D 0 2 40·0	12	47·9	25·2	604	−64	·106	+ 38·3	86·2*			
May 3	4 48	LV (Náyanárkoil)	D 0 7 33·5	8	46·8	34·6								
Mar. 13,14	2 21	LIII (Kŏdikulam)	E 0 1 7·3	8	48·1	5·2	405	−12	·030	+ 13·2	79·5	79·5	82	0·0
May 4	1 55	LV (Náyanárkoil)	D 0 5 49·7	8	21·1	34·6								
Mar. 13,14	2 31	LIII (Kŏdikulam)	D 0 5 46·4	8	10·7	5·2	493	−39	·079	− 20·1	47·7			
Apr. 28	2 54	LVI (Ramnad)	D 0 2 15·8	4	21·5	5·2						47·4	46·22	3·1
Mar. 17	2 27	LIV (Pŏragudi)	D 0 3 49·2	8	10·7	26·7	529	−33	·062	+ 33·7	47·0			
Apr. 28	3 35	LVI (Ramnad)	D 0 5 21·8	4	32·5	5·2								
Mar. 13,14	2 56	LIII (Kŏdikulam)	D 0 4 5·6	8	19·8	5·2	552	−55	·100	+ 8·4	76·2			
May 2	1 36	LVII (Sambuttiyendal)	D 0 4 59·4	4	21·4	4·7								
" 3	4 48	LV (Náyanárkoil)	D 0 5 41·7	4	20·1	34·6	547	−23	·042	+ 2·5	84·9*	77·5	78	20·8
" 2	2 40	LVII (Sambuttiyendal)	D 0 2 27·7	4	47·3	4·7								
1875														
Mar. 20,21,22	2 53	LVI (Ramnad)	D 0 1 39·5	12	10·0	5·2	435	−50	·115	+ 31·4	78·8			
" 12	2 53	LVII (Sambuttiyendal)	D 0 6 30·0	12	10·7	5·2								
" 20,21,22	2 14	LVI (Ramnad)	E 0 0 3·7	12	2·7	5·2	343	0	·000	+ 31·9	80·1			
" 14,15,16	2 18	LVIII (Uttarakoshamangai)	D 0 5 28·0	12	10·6	5·2						80·8	30·68 +49·34	0·7
" 10,11,12	2 19	LVII (Sambuttiyendal)	D 0 2 36·2	16	2·6	5·2	298	−12	·040	+ 3·2	81·5			
" 14,15,16	2 18	LVIII (Uttarakoshamangai)	D 0 2 31·0	12	9·8	5·2								
" 20,21,22	2 10	LVI (Ramnad)	D 0 0 2·9	12	28·0	5·2	427	5	·012	+ 20·3	68·5			
" 25,26,27	2 41	LIX (Kánjarangudi)	D 0 4 39·0	12	10·8	5·2						68·3	68	0·0
" 14,15,16	2 27	LVIII (Uttarakoshamangai)	D 0 1 46·7	12	28·0	5·2	354	8	·023	− 12·0	68·0			
" 25,26,27	2 39	LIX (Kánjarangudi)	D 0 1 54·8	12	2·6	5·2								
" 14,15,16	2 35	LVIII (Uttarakoshamangai)	D 0 0 0·0	12	33·0	5·2	322	5	·016	− 3·1	76·9			
" 28,29,30	2 33	LX (Yervádi)	D 0 2 34·1	12	2·6	5·3						77·1	76	0·0
" 25,26,27	2 18	LIX (Kánjarangudi)	E 0 1 35·2	12	33·5	5·2	298	−11	·037	+ 9·0	77·3			
" 28,29,30	2 17	LX (Yervádi)	D 0 1 7·9	12	27·9	5·3								
" 14,15,16	3 25	LVIII (Uttarakoshamangai)	D 0 6 16·4	12	30·5	5·2	523	−63	·120	− 38·4	41·6*			
Feb. 25,26,27,28	3 23	LXI (Tanichanthai)	D 0 3 53·7	16	2·7	17·6								
Mar. 28,29,30	2 13	LX (Yervádi)	D 0 5 26·1	16	30·6	5·3	363	−52	·143	− 41·6	35·5			
Feb. 24,25,26,27,28	2 15	LXI (Tanichanthai)	E 0 1 26·5	20	33·0	17·6						35·2	33·25	0·0
Mar. 2,3,4,5	2 16	LXII (Arapoth)	D 0 6 0·9	16	30·3	5·2	357	−28	·078	− 52·1	34·9			
Feb. 24,25,26,27,28	2 17	LXI (Tanichanthai)	E 0 1 50·4	20	21·2	17·6								
Mar. 10,11,12	3 16	LVII (Sambuttiyendal)	D 0 3 23·6	16	20·4	5·2	431	−101	·234	+ 8·7	87·0			
" 6	3 9	LXII (Arapoth)	D 0 5 40·8	8	8·9	5·2								

* Rejected.

Astronomical Date 1875	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Mar. 14,15,16	3 1	LVIII (Uttarakoshamangai)	D 0 2 38·5	12	20·5	5·2	479	−35	·073	+ 12·1	92·1*	87·3	85	24·6
„ 2,4,5,6	3 2	LXII (Arapoth)	D 0 5 36·9	20	2·7	5·2								
Feb. 24,25,26,27,28	2 17	LXI (Tanichanthai)	E 0 1 50·4	20	21·2	17·6	357	−28	·078	+ 52·1	87·6			
Mar. 2,3,4,5	2 16	LXII (Arapoth)	D 0 6 0·9	16	30·3	5·2								
Feb. 24,25,26,27	2 37	LXI (Tanichanthai)	D 0 3 29·7	16	12·1	17·6	469	−80	·171	+ 29·7	63·0			
„ 16,17,18,19	2 32	LXIII (Kadaládi)	D 0 5 35·6	16	30·0	5·2						61·4	62	20·4
Mar. 2,3,4,5	2 58	LXII (Arapoth)	D 0 6 35·5	20	12·1	5·2	506	−67	·132	− 25·6	59·8			
Feb. 16,17,18,19,20	2 51	LXIII (Kadaládi)	D 0 2 33·5	20	20·8	5·2								
„ 25,26,27,28	2 58	LXI (Tanichanthai)	D 0 4 12·7	16	22·5	17·6	491	−54	·110	+ 6·7	40·0			
„ 21,22,23	2 58	LXIV (Õpilán)	D 0 3 39·9	12	30·2	4·1						39·6	40	0·0
„ 16,17,18,19	2 36	LXIII (Kadaládi)	D 0 3 33·2	16	22·5	5·2	320	−21	·066	− 22·3	39·1			
„ 21,22,23	2 36	LXIV (Õpilán)	E 0 0 11·6	12	12·1	4·1								
Mar. 2,3,4,5	3 23	LXII (Arapoth)	D 0 4 52·8	20	18·9	5·2	521	−82	·158	− 0·8	84·6			
Feb. 14,15	3 5	LXV (Kidátirukai)	D 0 4 38·0	12	21·1	5·2						84·1	85	16·9
„ 17,18,19,20	2 27	LXIII (Kadaládi)	E 0 1 4·9	16	18·8	5·2	307	−18	·059	+ 22·1	83·5			
„ 11,12,13,14,15	2 23	LXV (Kidátirukai)	D 0 4 32·6	20	12·3	5·2								
„ 17,18,19,20	2 33	LXIII (Kadaládi)	D 0 3 0·9	16	29·0	5·2	449	−42	·094	− 5·0	56·4			
„ 3,4,5	2 32	LXVI (Taraigudi)	D 0 4 6·6	12	4·6	5·2								
„ 21,22,23	2 22	LXIV (Õpilán)	D 0 1 30·5	12	28·6	4·1	456	−45	·099	+ 16·3	55·9	56·4	57	0·0
„ 2,3,4,5	2 22	LXVI (Taraigudi)	D 0 4 27·8	16	22·8	5·2								
„ 7,8,9	2 33	LXVII (Pulápati)	D 0 2 16·1	12	29·3	5·2	297	15	·051	− 20·1	56·9			
„ 2,3,4,5	2 33	LXVI (Taraigudi)	D 0 0 43·6	16	2·6	5·2								
„ 16,17,18,19,20	3 5	LXIII (Kadaládi)	D 0 2 43·1	20	16·2	5·2	431	−72	·167	+ 15·3	76·7			
„ 6,7,8,9	3 8	LXVII (Pulápati)	D 0 6 3·0	16	4·6	5·2								
„ 11,12,13,15	2 35	LXV (Kidátirukai)	D 0 3 46·2	16	16·1	5·2	372	−62	·167	− 6·8	77·3	76·8	78	21·2
„ 6,7,8,9	2 34	LXVII (Pulápati)	D 0 3 4·2	16	10·1	5·2								
„ 2,3,4,5	2 33	LXVI (Taraigudi)	D 0 0 43·6	16	2·6	5·2	297	15	·051	+ 20·1	76·3			
„ 7,8,9	2 33	LXVII (Pulápati)	D 0 2 16·1	12	29·3	5·2								
„ 2,4,5	2 14	LXVI (Taraigudi)	D 0 1 38·7	12	13·7	5·2	373	−29	·078	+ 13·0	69·4			
Jan. 24,25,26,27,28	2 16	LXVIII (Annapúnáyakanpati)	D 0 2 35·2	20	29·2	5·2						70·0	71	19·6
Feb. 6,7,8,9	2 39	LXVII (Pulápati)	D 0 3 0·1	16	13·6	5·2	327	−29	·089	− 6·3	70·5			
Jan. 24,25,26,27,28	2 39	LXVIII (Annapúnáyakanpati)	D 0 2 52·3	20	2·3	5·2								
Feb. 2,3,4,5	2 25	LXVI (Taraigudi)	E 0 0 0·9	20	13·8	5·2	310	−31	·100	+ 19·7	76·1			
Jan. 30,31	2 9	LXIX (Súrangudi)	D 0 2 36·1	8	29·3	5·2						75·8	77	9
„ 24,25,26,27,28	2 34	LXVIII (Annapúnáyakanpati)	D 0 2 3·9	20	13·9	5·2	358	−26	·073	+ 5·5	75·5			
„ 30,31	2 25	LXIX (Súrangudi)	D 0 3 7·3	8	13·8	5·2								

* Rejected.

Astronomical Date 1875	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Feb. 6,7,8,9	2 32	LXVII (Pulápati)	E 0 1 21·5	20	19·1	5·2	409	−99	·242	+ 63·5	140·3			
Jan. 21,22,23	2 33	LXX (Mutúruni)	D 0 10 35·0	12	2·3	5·2						139·1	141	6
„ 24,25,26, 27,28	2 55	LXVIII (Annapúnáyakanpati)	E 0 3 28·4	25	19·0	5·2	346	−100	·289	+ 67·9	137·9			
„ 21,22,23	2 43	LXX (Mutúruni)	D 0 11 29·4	12	2·6	5·2								
„ 26,28	3 42	LXVIII (Annapúnáyakanpati)	D 0 2 11·5	16	16·1	5·2	421	−92	·219	+ 24·5	94·5			
„ 14,15,16	3 59	LXXI (Mŏtúruni)	D 0 6 31·4	20	11·3	5·2								
„ 30,31, Feb. 1	2 30	LXIX (Súrangudi)	D 0 2 52·4	16	16·3	5·2	531	−43	·081	+ 24·6	100·4	97·6	99	8
„ 13,14,15	2 27	LXXI (Mŏtúruni)	D 0 6 9·9	13	14·1	5·2								
„ 18,19,20	2 36	LXXII (Melakalúruni)	D 0 9 0·5	12	15·6	5·2	307	−55	·179	− 60·5	98·0			
„ 13,14,15	2 37	LXXI (Mŏtúruni)	E 0 2 58·5	13	2·6	5·2								
„ 26,27,28	2 10	LXVIII (Annapúnáyakanpati)	E 0 2 52·2	12	12·4	5·2	458	−29	·063	+ 89·4	159·4			
„ 18,19,20	2 17	LXXII (Melakalúruni)	D 0 10 28·5	16	11·4	5·2								
„ 21,22,23	2 22	LXX (Mutúruni)	D 0 2 37·7	16	12·3	5·2	410	−79	·193	+ 18·4	157·5	158·3	160	11·1
„ 18,19,20	2 19	LXXII (Melakalúruni)	D 0 5 11·2	12	18·2	5·2								
„ 13,14,15	2 37	LXXI (Mŏtúruni)	E 0 2 58·5	13	2·6	5·2	307	−55	·179	+ 60·5	158·0			
„ 18,19,20	2 36	LXXII (Melakalúruni)	D 0 9 0·5	12	15·6	5·2								
„ 13,14,15	2 15	LXXI (Mŏtúruni)	E 0 1 19·4	12	2·7	5·2	470	−38	·081	+ 83·9	181·5			
„ 10,11,12	2 16	LXXIII (Supalápuram)	D 0 10 26·3	12	7·9	5·2								
„ 18,19,20	2 14	LXXII (Melakalúruni)	D 0 5 13·3	12	3·0	5·2	678	−13	·019	+ 15·4	173·7	177·5	180	21·1
„ 10,11,12	2 15	LXXIII (Supalápuram)	D 0 6 47·3	12	2·6	5·2								
„ 6,7,8	2 45	LXXIV (Minákshi)	D 0 13 40·3	12	2·5	5·3	611	− 1	·002	−151·0	177·2			
„ 10,11,12	2 45	LXXIII (Supalápuram)	E 0 3 9·9	12	2·8	5·2								
„ 13,14,15	2 51	LXXI (Mŏtúruni)	E 0 3 56·3	12	2·7	5·2	761	0	·000	+232·9	330·5			
„ 6,7,8	2 52	LXXIV (Minákshi)	D 0 16 38·8	12	7·8	5·3								
„ 18,19,20	2 11	LXXII (Melakalúruni)	E 0 2 35·2	12	2·7	5·2	699	23	·033	+167·5	325·8	328·3	330	†
„ 6,7,8	2 11	LXXIV (Minákshi)	D 0 13 42·5	12	2·6	5·3								
„ 10,11,12	2 45	LXXIII (Supalápuram)	E 0 3 9·9	12	2·8	5·2	611	− 1	·002	+151·0	328·6			
„ 6,7,8	2 45	LXXIV (Minákshi)	D 0 13 40·3	12	2·5	5·3								
„ 10,11,12	2 27	LXXIII (Supalápuram)	E 0 7 23·8	12	2·8	5·2	856	18	·021	+360·5	538·0			
„ 2,3	2 26	LXXXIII (Koilpati)	D 0 21 15·1	12	2·5	5·2								
„ 6,7,8	1 56	LXXIV (Minákshi)	E 0 11 57·3	12	2·8	5·3	464	26	·056	+212·3	540·6	540·4	546·14 −3·5*	1·1
„ 2,3	1 56	LXXXIII (Koilpati)	D 0 19 9·4	8	3·0	5·2								
(1)	2 29	LXXXV (Kulayanallúr)	D 0 0 26·1	16	2·7	5·2	954	54	·057	+188·0	542·7			
(2)	2 31	LXXXIII (Koilpati)	D 0 13 50·6	12	2·6	5·2								
1874-75														
Jan. 10,11,12	2 9	LXXIII (Supalápuram)	E 0 4 33·0	12	2·6	5·2	634	24	·038	+178·6	356·1			
Dec. 30,31	2 11	LXXXV (Kulayanallúr)	D 0 14 36·6	16	2·5	5·2								

NOTE.—Stations LXXXIII (Koilpati) and LXXXV (Kulayanallúr) appertain to the Great Arc Meridional Series, Section 8° to 18°.
(1). The mean of observations taken on 12th, 13th and 14th January, and 30th December, 1874.
(2). Do. do. 8th and 9th January, 1874, and 2nd January, 1875.
* Assumed height of the rectangular protecting pillar above the circular pillar. † See description of this station, page 16d—F.

Astronomical Date 1874-75	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Jan. 6,7,8	2 20	LXXIV (Mínákshi)	D 0 7 0·7	12	2·6	5·3	1017	44	·043	+ 25·0	353·3	353·6	356	1
Dec. 30,31	2 20	LXXXV (Kulayanallúr)	D 0 8 39·6	16	3·0	5·2								
(1)	2 31	LXXXIII (Koilpati)	D 0 13 50·6	12	2·6	5·2	954	54	·057	−188·0	351·3			
(2)	2 29	LXXXV (Kulayanallúr)	D 0 0 26·1	16	2·7	5·2								

Note.—Stations LXXXIII (Koilpati) and LXXXV (Kulayanallúr) appertain to the Great Arc Meridional Series, Section 8° to 18°.
(1). The mean of observations taken on 8th and 9th January, 1874, and 2nd January, 1875.
(2). Do. do. 12th, 13th and 14th January, and 30th December, 1874.

CEYLON BRANCH SERIES OF THE SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.

Astronomical Date 1875	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Mar. 25,26,27	2 32	LIX (Kánjarangudi)	D 0 7 55·5	12	13·3	5·2	387	12	·031	− 63·7	4·0			
Apr. 1,2	2 32	LXXV (Púvarasanhalli Tívu)	E 0 4 32·7	8	28·0	5·2								
Mar. 28,29,30	2 22	LX (Yervádi)	D 0 10 24·4	12	13·3	5·3	262	6	·023	− 72·1	3·7	4·0	4	0·0
Apr. 1,2	2 22	LXXV (Púvarasanhalli Tívu)	E 0 10 55·6	8	33·4	5·2								
„ 4,5	2 11	LXXVI (Appa Tívu)	D 0 2 40·6	8	13·0	6·5	273	−10	·037	− 8·3	4·4			
„ 1,2	2 12	LXXV (Púvarasanhalli Tívu)	D 0 0 21·9	8	13·6	5·2								
Mar. 25,26,27	2 26	LIX (Kánjarangudi)	D 0 7 38·3	12	13·7	5·2	301	8	·027	− 55·1	12·6			
Apr. 4,5	2 23	LXXVI (Appa Tívu)	E 0 6 20·6	8	28·6	6·5								
Mar. 28,29,30	2 45	LX (Yervádi)	D 0 7 45·2	12	13·6	5·3	412	12	·029	− 63·0	12·8	12·5	12	0·0
Apr. 4,5	2 46	LXXVI (Appa Tívu)	E 0 4 9·4	8	33·1	6·5								
„ 1,2	2 12	LXXV (Púvarasanhalli Tívu)	D 0 0 21·9	8	13·6	5·2	273	−10	·037	+ 8·3	12·2			
„ 4,5	2 11	LXXVI (Appa Tívu)	D 0 2 40·6	8	13·0	6·5								

Astronomical Date 1875	Astronomical Date: Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Mar. 25,26,27	2 22	LIX (Kánjarangudi)	D 0 6 18·8	12	12·4	5·2	349	− 6	·017	− 41·0	26·7			
Apr. 11,12,13	2 22	LXXVII (Pĕriyapatnam)	E 0 3 9·2	12	28·8	6·5								
„ 4,5	2 38	LXXVI (Appa Tívu)	D 0 1 39·8	8	12·4	6·5	423	10	·024	+ 15·3	27·8	28·4	28	10·5
„ 11,12,13	2 38	LXXVII (Pĕriyapatnam)	D 0 3 8·2	12	24·5	6·5								
„ 8,9,10	2 27	LXXVIII (Válai Tívu)	E 0 1 18·9	12	12·0	5·2	264	9	·034	+ 19·3	30·8			
„ 11,12,13	2 27	LXXVII (Pĕriyapatnam)	D 0 2 51·6	12	19·5	6·5								
Mar. 25,26,27	2 20	LIX (Kánjarangudi)	D 0 6 53·4	12	19·0	5·2	519	20	·039	− 58·1	9·6			
Apr. 8,9,10	2 22	LXXVIII (Válai Tívu)	E 0 1 21·8	12	28·6	5·2								
„ 4,5	3 39	LXXVI (Appa Tívu)	D 0 3 28·2	12	19·1	6·5	417	−65	·156	+ 0·9	13·4	10·3	10	5
„ 8,9	4 10	LXXVIII (Válai Tívu)	D 0 3 4·3	12	24·5	5·2								
„ 11,12,13	2 27	LXXVII (Pĕriyapatnam)	D 0 2 51·6	12	19·5	6·5	264	9	·034	− 19·3	8·0			
„ 8,9,10	2 27	LXXVIII (Válai Tívu)	E 0 1 18·9	12	12·0	5·2								
„ 11,12,13	2 24	LXXVII (Pĕriyapatnam)	D 0 1 52·5	12	24·5	6·5	546	13	·024	+ 21·3	49·7			
„ 15,16	2 54	LXXIX (Rámaswámi Madam)	D 0 5 18·8	8	12·9	7·5								
„ 8,9,10	2 21	LXXVIII (Válai Tívu)	D 0 0 15·2	12	24·5	5·2	512	12	·023	+ 38·0	48·3	48·5	51·78 − 3·5*	0·8
„ 15,16	2 22	LXXIX (Rámaswámi Madam)	D 0 5 47·9	8	19·4	7·5								
„ 19,20	2 17	LXXX (Musal Tívu)	E 0 5 39·9	8	24·5	22·8	219	11	·050	+ 45·5	47·6			
„ 15,16	2 16	LXXIX (Rámaswámi Madam)	D 0 3 40·5	8	40·0	7·5								
„ 11,12,13	2 37	LXXVII (Pĕriyapatnam)	D 0 4 11·0	12	40·3	6·5	595	20	·034	− 26·0	2·4			
„ 19,20	2 36	LXXX (Musal Tívu)	D 0 3 42·5	8	13·0	22·8								
„ 8,9,10	2 18	LXXVIII (Válai Tívu)	D 0 1 44·7	12	40·7	5·2	457	4	·009	− 8·6	1·7	2·5	2	0·8
„ 19,20	2 24	LXXX (Musal Tívu)	D 0 3 23·5	8	18·9	22·8								
„ 15,16	2 16	LXXIX (Rámaswámi Madam)	D 0 3 40·5	8	40·0	7·5	219	11	·050	− 45·5	3·5			
„ 19,20	2 17	LXXX (Musal Tívu)	E 0 5 39·9	8	24·5	22·8								
„ 15,16	2 30	LXXIX (Rámaswámi Madam)	E 0 1 19·9	8	23·9	7·5	247	−15	·061	+ 10·1	58·4			
„ 27,28,29	2 30	LXXXI (Marakayárpatnam)	D 0 1 4·9	12	24·3	5·2								
„ 19,20	2 26	LXXX (Musal Tívu)	E 0 3 27·7	8	23·7	22·8	326	14	·043	+ 56·1	58·4	57·8	61·75 − 3·5*	0·9
„ 27,28,29	2 27	LXXXI (Marakayárpatnam)	D 0 4 42·7	12	39·9	5·2								
„ 24,25	2 32	LXXXII (Púmurichán)	E 0 5 33·7	8	23·6	3·2	215	10	·047	+ 25·2	56·7			
„ 27,28,29	2 32	LXXXI (Marakayárpatnam)	D 0 5 30·3	12	6·0	5·2								
„ 15,16	3 2	LXXIX (Rámaswámi Madam)	D 0 5 10·0	12	6·1	7·5	433	− 1	·002	− 18·0	30·3			
„ 24,25	3 1	LXXXII (Púmurichán)	D 0 0 32·6	8	24·6	3·2								
„ 19,20	2 24	LXXX (Musal Tívu)	D 0 2 0·2	8	6·2	22·8	411	17	·041	+ 30·4	32·7	32·1	33	28
„ 24,25	2 25	LXXXII (Púmurichán)	D 0 2 37·2	8	40·0	3·2								
„ 27,28,29	2 32	LXXXI (Marakayárpatnam)	D 0 5 30·3	12	6·0	5·2	215	10	·047	− 25·2	33·2			
„ 24,25	2 32	LXXXII (Púmurichán)	E 0 5 33·7	8	23·6	3·2								

* Assumed height of the rectangular protecting pillar above the circular pillar.

Astronomical Date 1875-76	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Apr. 27,28,29 1876	2 16	LXXXI (Marakayárpatnam)	D 0 2 26·8	12	2·6	5·2	633	6	·009	+ 53·8	112·1	112·9	80·00 +34·72	*
" 14 1875	2 12	LXXXIII (Gandhamána)	D 0 7 3·4	4	24·3	5·3								
" 24,25 1876	2 31	LXXXII (Púmurichán)	E 0 1 24·8	8	2·6	3·2	498	5	·010	+ 81·0	113·6			
" 14,15 1875	2 29	LXXXIII (Gandhamána)	D 0 9 31·5	8	6·2	5·3								
" 28,29 1876	2 24	LXXXI (Marakayárpatnam)	D 0 8 30·8	8	4·0	5·2	672	− 8	·012	− 53·7	† 4·6			
" 10,11	2 7	LXXXIV (Pisásu Mundal)	D 0 3 15·8	8	24·4	29·2								
" 14,15	1 59	LXXXIII (Gandhamána)	D 0 22 46·3	8	47·0	5·3	93	0	·000	−101·7	13·0	13·0	13·8‡	1
" 10,11	1 59	LXXXIV (Pisásu Mundal)	E 0 26 46·6	8	2·7	29·2								
" 23	2 13	LXXXII (Púmurichán)	D 0 2 29·1	8	2·9	5·3	500	1	·002	+ 26·8	59·4	60·4	61	0·0
" 18,19	2 13	LXXXV (Masánam Karai)	D 0 5 55·3	8	6·1	5·3								
" 14,15	1 59	LXXXIII (Gandhamána)	D 0 14 36·2	8	2·7	5·3	141	1	·007	− 53·3	61·4			
" 18,19	1 57	LXXXV (Masánam Karai)	E 0 10 59·5	8	2·6	5·3								
" 14,15	2 11	LXXXIII (Gandhamána)	D 0 9 17·9	8	37·3	5·3	843	43	·051	−105·9	8·8			
" 8,4	2 11	LXXXVI (Kachi Tívu, N.)	D 0 3 4·6	8	2·7	28·3								
" 17	2 20	LXXXIV (Pisásu Mundal)	D 0 6 19·4	4	37·3	35·7	793	25	·032	− 4·5	9·3	9·1	10·4‡	1
" 3,4	2 19	LXXXVI (Kachi Tívu, N.)	D 0 5 10·9	8	47·5	28·3								
" 6,7	2 6	LXXXVII (Kachi Tívu, S.)	E 0 6 42·9	8	37·6	25·0	39	7	·179	− 4·7	9·1			
" 8,4	2 5	LXXXVI (Kachi Tívu, N.)	E 0 12 13·5	8	37·7	28·3								
" 14,15	2 8	LXXXIII (Gandhamána)	D 0 9 10·2	8	37·4	5·3	851	44	·052	−102·3	12·4			
" 6,7	2 9	LXXXVII (Kachi Tívu, S.)	D 0 3 10·1	8	2·7	25·0								
" 18,19	2 18	LXXXV (Masánam Karai)	D 0 7 17·7	8	37·4	5·3	867	27	·031	− 45·3	15·1	13·8	15	1·5
" 6,7	2 19	LXXXVII (Kachi Tívu, S.)	D 0 5 52·8	8	2·8	25·0								
" 8,4	2 5	LXXXVI (Kachi Tívu, N.)	E 0 12 13·5	8	37·7	28·3	39	7	·179	+ 4·7	13·8			
" 6,7	2 6	LXXXVII (Kachi Tívu, S.)	E 0 6 42·9	8	37·6	25·0								
" 8,4	2 22	LXXXVI (Kachi Tívu, N.)	D 0 5 13·0	8	35·3	28·3	746	18	·024	+ 8·4	18·8			
Mar. 25,26	2 26	LXXXVIII (Ámanakamunai)	D 0 5 47·0	8	37·3	25·9								
Apr. 6,7	2 1	LXXXVII (Kachi Tívu, S.)	D 0 5 35·8	8	35·6	25·0	759	12	·016	+ 1·4	16·5	17·0	13·9‡	1
Mar. 25,26	2 2	LXXXVIII (Ámanakamunai)	D 0 5 40·7	8	37·4	25·9								
" 29	1 57	LXXXIX (Ūrimunai)	D 0 2 17·5	8	35·2	25·1	362	−35	·097	+ 3·8	15·6			
" 25,26	1 56	LXXXVIII (Ámanakamunai)	D 0 2 47·9	8	38·1	25·9								
Apr. 3,4	2 11	LXXXVI (Kachi Tívu, N.)	D 0 5 25·9	8	37·6	28·3	760	21	·028	+ 3·1	13·5			
Mar. 29	2 11	LXXXIX (Ūrimunai)	D 0 5 34·7	8	37·3	25·1								
Apr. 6,7	2 18	LXXXVII (Kachi Tívu, S.)	D 0 5 29·8	8	37·6	25·0	754	27	·036	− 5·0	10·1	12·5	11·4‡	1
Mar. 29	2 19	LXXXIX (Ūrimunai)	D 0 5 4·6	8	37·2	25·1								
" 25,26	1 56	LXXXVIII (Ámanakamunai)	D 0 2 47·9	8	38·1	25·9	362	−35	·097	− 3·8	13·9			
" 29	1 57	LXXXIX (Ūrimunai)	D 0 2 17·5	8	35·2	25·1								

* See description of this station, page 16f—F. † Rejected. ‡ These heights were obtained by observing the height of the tides on a stake driven into the bed of a sheltered pool or pit on the beach, just under the station, and measuring the actual height of the station above the mean sea level so arrived at: the latter is obviously only approximate; but as the observations were made with some care, the references to sea level may be reckoned on as very little in error: and the heights in terms thereof have been accepted as final in preference to the Trigonometrical values.

Description of Spirit-levelled Points.

When determining the Spirit-levelled heights, given on pages 133—F. to 146—F., the levelling staff stood on the surfaces hereafter described.

VI (Kallapat)	On a peg at the foot of the mound on which the station is built, height = 189·31 feet. To this value, 13·38 feet (the height of the upper surface of the rectangular protecting pillar above this peg) being added, the height of the upper surface of the protecting pillar was found to be 202·69 feet.
XXIII (Kumbakonam)	On an unmarked spot on the platform of the tower on which the station is fixed, height = 91·20 feet. To this value, 46·78 feet (the height of the upper mark-stone of the pillar on the tower above this spot) being added, the height of the upper mark-stone was found to be 137·98 feet.
XXX (Rárámutiraikota)	On a peg at the foot of the station, height = 144·01 feet. To this value, 10·50 feet (the height of the upper surface of the rectangular protecting pillar above this peg) being added, the height of the upper surface of the protecting pillar was found to be 154·51 feet.
XXXII (Kakkrákota)	On a peg at the foot of the station, height = 120·74 feet. To this value, 9·29 feet (the height of the upper surface of the circular pillar above this peg) being added, the height of the upper surface of the pillar was found to be 130·03 feet.
XXXV (Kallakota)	On a peg at the foot of the station, height = 181·51 feet. To this value, 4·11 feet (the height of the mark-stone in the upper surface of the rectangular protecting pillar above this peg) being added, the height of the mark-stone on the protecting pillar was found to be 185·62 feet.
XXXVII (Kárakkurchi) XL (Kulamangalam) XLII (Pallathivayal) XLIV (Kánád) XLIX (Nambudalai) LI (Ŭrannankudi) LIV (Pŏragudi)	On the mark-stone in the upper surface of the rectangular protecting pillar.
LVI (Ramnad)	On a peg at the foot of the station, height = 21·11 feet. To this value, 27·11 feet (the height of the upper mark-stone above this peg) being added, the height of the upper mark-stone was found to be 48·22 feet.
LVIII (Uttarakoshamangai)	On a peg at the foot of the station, height = 30·68 feet. To this value, 49·34 feet (the height of the upper surface of the circular pillar built on the temple above this peg) being added, the height of the upper surface of the pillar was found to be 80·02 feet.
LXI (Tanichanthai)	On the mark-stone at the ground level.

For further particulars of these stations, see pages 7—F. to 16b—F.

Description of Spirit-levelled Points—(Continued).

LXXXIII (Koilpati) On rock at the foot of the hill, height = 457·04 feet. To this value, 89·10 feet (the height of the upper surface of the rectangular protecting pillar above this rock) being added, the height of the upper surface of the protecting pillar was found to be 546·14 feet.

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LXXIX (Rámaswámi Madam) On a peg at the foot of the station, height = 49·01 feet. To this value, 2·77 feet (the height of the mark-stone in the upper surface of the rectangular protecting pillar above this peg) being added, the height of the mark-stone on the protecting pillar was found to be 51·78 feet.

LXXXI (Marakayárpatnam) On a peg at the foot of the pillar, height = 58·37 feet. To this value, 3·38 feet (the height of the mark-stone in the upper surface of the rectangular protecting pillar above this peg) being added, the height of the mark-stone on the protecting pillar was found to be 61·75 feet.

LXXXIII (Gandhamána) On a peg at the foot of the station, height = 80·00 feet. To this value, 34·72 feet (the height of the mark-stone on the roof of the temple above this peg) being added, the height of the mark-stone was found to be 114·72 feet.

For further particulars of these stations, see pages 16*d*—F. *to* 16*f*—F.

April, 1888.

S. G. BURRARD,
In charge of Computing Office.

SOUTH-EAST COAST SERIES.

PRINCIPAL TRIANGULATION. AZIMUTHAL OBSERVATIONS.

At VI (Kallapat)

Lat. N. 11° 57′ 12″·30; Long. E. 79° 36′ 20″·14 = $5^h\ 18^m\ 25^s{\cdot}3$; Height above Mean Sea Level, 199 feet.
March 1879; observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No. 1.

Star observed	α Ursæ Minoris (West).
Mean Right Ascension 1879·0	$1^h\ 14^m\ 23^s$
Mean North Polar Distance 1879·0	1° 20′ 10″·07
Local Mean Time of Elongation, March 10	Western $8^h\ 1^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 10	W.	0 2	+ 36 5 17·07	28 48	+ 0 38·62	+ 36 5 55·69	+ 36 5 48·25	11 10	+ 0 5·81	+ 36 5 54·06
		&	5 26·64	24 49	0 28·68	55·32	5 51·64	7 50	0 2·86	54·50
		180 1	5 55·46	2 10	0 0·22	55·68	5 45·45	13 0	0 7·88	53·33
			5 54·99	4 5	0 0·78	55·77	5 41·89	15 51	0 11·69	53·58
			5 16·38	29 16	0 39·81	56·19	4 26·10	43 24	1 27·40	53·50
			5 7·97	32 6	0 47·77	55·74	4 13·28	46 51	1 41·79	55·07
" 11	W.	79 12	+ 36 5 28·05	24 51	+ 0 28·76	+ 36 5 56·81	+ 36 5 51·94	7 53	+ 0 2·89	+ 36 5 54·83
		&	5 35·52	21 16	0 21·06	56·58	5 54·51	5 15	0 1·28	55·79
		259 12	5 56·09	4 42	0 1·03	57·12	5 43·47	16 9	0 12·13	55·60
			5 54·65	7 39	0 2·73	57·38	5 37·76	19 27	0 17·60	55·36
			5 19·22	28 32	0 37·84	57·06	4 29·02	43 6	1 26·21	55·23
			5 11·67	31 15	0 45·39	57·06	4 15·99	46 25	1 39·93	55·92
" 12	W.	158 25	+ 36 5 25·96	25 57	+ 0 31·36	+ 36 5 57·32	+ 36 5 48·76	10 55	+ 0 5·55	+ 36 5 54·31
		&	5 31·53	23 5	0 24·82	56·35	5 51·86	6 54	0 2·22	54·08
		338 25	5 50·73	6 24	0 1·91	52·64	5 24·72	25 15	0 29·65	54·37
			5 48·81	9 17	0 4·02	52·83	5 9·83	30 54	0 44·38	54·21
			4 34·78	41 50	1 21·23	56·01	3 9·53	60 27	2 49·08	58·61
			4 14·23	47 7	1 42·96	57·19	2 49·31	63 1	3 3·64	52·95
" 13	W.	237 37	+ 36 5 28·28	24 39	+ 0 28·29	+ 36 5 56·57	+ 36 5 51·91	5 30	+ 0 1·41	+ 36 5 53·32
		&	5 33·77	22 9	0 22·84	56·61	5 53·22	1 9	0 0·06	53·28
		57 37	5 45·89	12 40	0 7·47	53·36	5 15·93	28 38	0 38·13	54·06
			5 41·25	17 29	0 14·23	55·48	5 5·14	32 52	0 50·22	55·36
			4 16·16	46 7	1 38·69	54·85	3 8·43	60 11	2 47·64	56·07
			3 59·67	49 42	1 54·55	54·22	2 37·44	65 31	3 18·44	55·88

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 14	W.	316 49	+ 36 4 40·49	40 11	+ 1 15·15	+ 36 5 55·64	+ 36 5 19·77	27 24	+ 0 34·97	+ 36 5 54·74
		&	4 53·14	36 52	1 3·26	56·40	5 29·67	23 38	0 26·03	55·70
		136 49	5 50·00	11 47	0 6·47	56·47	5 55·21	1 43	0 0·14	55·35
			5 53·69	8 45	0 3·57	57·26	5 54·34	4 41	0 1·02	55·36
			5 43·52	16 13	0 12·26	55·78	5 11·35	30 49	0 44·18	55·53
			5 39·70	18 43	0 16·32	56·02	5 2·03	34 1	0 53·77	55·80

Abstract of Astronomical Azimuth observed at VI (Kallapat) 1879.

By Western Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	0°	180°	79°	259°	158°	338°	238°	58°	317°	137°
Date	March 10		March 11		March 12		March 13		March 14	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. – Star reduced to Elongation	55·69	54·06	56·81	54·83	57·32	54·31	56·57	53·32	55·64	54·74
	55·32	54·50	56·58	55·79	56·35	54·08	56·61	53·28	56·40	55·70
	55·68	53·33	57·12	55·60	52·64	54·37	53·36	54·06	56·47	55·35
	55·77	53·58	57·38	55·36	52·83	54·21	55·48	55·36	57·26	55·36
	56·19	53·50	57·06	55·23	56·01	58·61	54·85	56·07	55·78	55·53
	55·74	55·07	57·06	55·92	57·19	52·95	54·22	55·88	56·02	55·80
Means	55·73	54·01	57·00	55·46	55·39	54·76	55·18	54·66	56·26	55·41
	° ′ ″		″		″		″		″	
Means of both faces	+ 36 5 54·87		56·23		55·07		54·92		55·84	
Level Corrections	+ 0·04		– 0·32		– 0·12		+ 1·08		– 0·36	
Corrected Means	+ 36 5 54·91		55·91		54·95		56·00		55·48	
Az. of Star fr. S., by W.	178 38 23·90		23·59		23·29		22·98		22·67	
Az. of Ref. M. „	214 44 18·81		19·50		18·24		18·98		18·15	

		° ′ ″
Astronomical Azimuth of Referring Mark or IV (Pĕrumukkal)	by Western Elongation	214 44 18·74
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 126—F. *ante*	... ...	214 44 23·89
Astronomical — Geodetical Azimuth at VI (Kallapat)	... ...	– 5·15

At XXII (Nayinipiriyán)

Lat. N. 11° 7′ 49″·06; Long. E. 79° 23′ 18″·37 = 5h 17m 33s·2; Height above Mean Sea Level, 158 feet.
January 1879; observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No. 1.

Star observed	δ Ursæ Minoris (East).
Mean Right Ascension 1879·0	18h 11m 22s
Mean North Polar Distance 1879·0	3° 23′ 28″·66
Local Mean Time of Elongation, January 6	Eastern 17h 9m

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Jan. 6	E.	247 6	− 30 30 0·05	17 1	− 0 34·20	− 30 30 34·25	− 30 30 35·70	0 41	− 0 0·06	− 30 30 35·76
		&	30 13·68	12 27	0 18·31	31·99	30 31·84	3 34	0 1·51	33·35
		67 5	30 5·58	15 57	0 30·12	35·70	28 51·59	29 25	1 42·31	33·90
			29 51·81	18 40	0 41·26	33·07	28 31·78	32 18	2 3·34	35·12
			26 57·38	42 49	3 36·63	34·01	24 17·47	56 29	6 16·47	33·94
			26 18·24	46 17	4 13·06	31·30	23 34·42	59 32	6 58·06	32·48
„ 7	E.	326 18	− 30 30 32·39	1 2	− 0 0·13	− 30 30 32·52	− 30 30 8·61	14 14	− 0 23·93	− 30 30 32·54
		&	30 31·45	3 26	0 1·40	32·85	30 17·43	10 44	0 13·62	31·05
		146 18	28 42·19	30 10	1 47·69	29·88	30 7·63	13 56	0 22·99	30·62
			28 16·32	33 34	2 13·30	29·62	29 58·00	17 6	0 34·62	32·62
			22 52·24	62 26	7 39·60	31·84	26 27·44	45 31	4 4·73	32·17
			21 54·34	66 7	8 35·15	29·49	25 49·63	48 48	4 41·22	30·85
„ 8	E.	45 19	− 30 27 34·95	38 46	− 2 57·04	− 30 30 31·99	− 30 29 21·19	24 43	− 1 12·13	− 30 30 33·32
		&	28 0·57	36 2	2 33·03	33·60	29 37·08	21 44	0 55·80	32·88
		225 19	30 16·51	11 45	0 16·32	32·83	30 32·21	0 52	0 0·09	32·30
			30 21·95	9 25	0 10·49	32·44	30 31·54	3 57	0 1·85	33·39
			30 3·46	15 39	0 28·99	32·45	28 51·03	29 17	1 41·46	32·49
			29 51·08	18 29	0 40·44	31·52	28 28·81	32 14	2 2·91	31·72
„ 9	E.	124 32	− 30 26 9·35	47 19	− 4 23·32	− 30 30 32·67	− 30 28 55·46	28 54	− 1 38·53	− 30 30 33·99
		&	26 53·26	43 13	3 39·84	33·10	29 19·97	24 59	1 13·68	33·65
		304 31	30 12·91	13 9	0 20·43	33·34	30 35·01	0 46	0 0·07	35·08
			30 21·21	10 26	0 12·87	34·08	30 33·43	3 47	0 1·70	35·13
			30 6·25	14 53	0 26·23	32·48	28 58·81	28 27	1 35·79	34·60
			29 54·83	17 48	0 37·52	32·35	28 37·59	31 36	1 58·16	35·75
„ 10	E.	203 43	− 30 25 47·86	49 20	− 4 46·10	− 30 30 33·96	− 30 28 19·32	33 52	− 2 15·21	− 30 30 34·53
		&	26 24·39	45 55	4 8·01	32·40	28 52·50	29 11	1 40·45	32·95
		23 43	30 2·66	16 12	0 31·00	33·66	30 13·67	13 40	0 22·12	35·79
			30 31·62	0 43	0 0·06	31·68	30 3·50	16 26	0 31·98	35·48
			28 53·13	28 50	1 38·30	31·43	26 39·24	44 32	3 54·31	33·55
			28 30·21	32 12	2 2·59	32·80	26 0·91	48 2	4 32·50	33·41

Abstract of Astronomical Azimuth observed at XXII (Nayinipiriyán) 1879.

By Eastern Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	247°	67°	326°	146°	45°	225°	125°	305°	204°	24°
Date	January 6		January 7		January 8		January 9		January 10	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	34·25	35·76	32·52	32·54	31·99	33·32	32·67	33·99	33·96	34·53
	31·99	33·35	32·85	31·05	33·60	32·88	33·10	33·65	32·40	32·95
	35·70	33·90	29·88	30·62	32·83	32·30	33·34	35·08	33·66	35·79
	33·07	35·12	29·62	32·62	32·44	33·39	34·08	35·13	31·68	35·48
	34·01	33·94	31·84	32·17	32·45	32·49	32·48	34·60	31·43	33·55
	31·30	32·48	29·49	30·85	31·52	31·72	32·35	35·75	32·80	33·41
Means	33·39	34·09	31·03	31·64	32·47	32·68	33·00	34·70	32·66	34·28
	° ′ ″		″		″		″		″	
Means of both faces	− 30 30 33·74		31·34		32·57		33·85		33·47	
Level Corrections	− 0·21		− 0·20		− 0·03		+ 0·02		− 0·22	
Corrected Means	− 30 30 33·95		31·54		32·60		33·83		33·69	
Az. of Star fr. S., by W.	183 27 32·16		32·52		32·87		33·23		33·59	
Az. of Ref. M. „	152 56 58·21		60·98		60·27		59·40		59·90	

		° ′ ″
Astronomical Azimuth of Referring Mark or XX (Kachipĕrumál)	by Eastern Elongation	152 56 59·75
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 127—F. *ante*	... ...	152 57 1·92
Astronomical — Geodetical Azimuth at XXII (Nayinipiriyán)	... ...	− 2·17

At XXXIII (Pátharankota)

Lat. N. 10° 28′ 2″·31 ; Long. E. 79° 15′ 10″·77 = 5ʰ 17ᵐ 0ˢ·7 ; Height above Mean Sea Level, 120 feet.
March 1877 ; observed by Captain T. T. Carter, R.E., with Troughton and Simms' 24-inch Theodolite No. 1.

Stars observed	α Ursæ Minoris (West)	and β Ursæ Minoris (East).
Mean Right Ascension 1877·0	$1^h\ 13^m\ 41^s$	$14^h\ 51^m\ 5^s$
Mean North Polar Distance 1877·0	1° 20′ 48″·11	15° 20′ 31″·34
Local Mean Times of Elongation, March 19	Western $7^h\ 23^m$	Eastern $9^h\ 14^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 19	W.	0 0 & 180 0	+ 1 10 29·14	11 28	+ 0 6·15	+ 1 10 35·29	+ 1 10 35·06	0 16	+ 0 0·00	+ 1 10 35·06
			10 32·02	8 37	0 3·47	35·49	10 36·35	3 16	0 0·50	36·85
			10 26·75	12 41	0 7·52	34·27	10 6·88	25 30	0 30·37	37·25
			10 24·21	15 43	0 11·55	35·76	10 1·08	28 0	0 36·61	37·69
			9 31·29	36 49	1 3·24	34·53	8 57·41	46 8	1 39·15	36·56
			9 24·52	39 6	1 11·30	35·82	8 48·51	48 38	1 50·13	38·64
„ 19	E.	0 0 & 180 0	− 15 36 4·76	38 2	− 12 11·48	− 15 48 16·24	− 15 43 37·27	23 18	− 4 35·66	− 15 48 12·93
			37 51·92	35 3	10 21·79	13·71	44 32·05	20 50	3 40·54	12·59
			46 59·50	12 7	1 14·80	14·30	48 10·64	2 29	0 3·14	13·78
			47 23·04	9 47	0 48·80	11·84	47 53·19	6 9	0 19·33	12·52
			45 59·70	16 17	2 15·77	15·47	40 36·11	29 53	7 38·50	14·61
			45 7·03	19 5	3 6·58	13·61	39 9·19	32 32	9 3·64	12·83
„ 20	W.	79 12 & 259 12	+ 1 10 10·23	22 48	+ 0 24·31	+ 1 10 34·54	+ 1 10 29·66	11 5	+ 0 5·75	+ 1 10 35·41
			10 16·67	20 5	0 18·87	35·54	10 33·26	8 23	0 3·29	36·55
			10 34·50	1 9	0 0·06	34·56	10 25·67	13 18	0 8·27	33·94
			10 34·72	4 17	0 0·86	35·58	10 22·67	16 19	0 12·45	35·12
			10 5·37	24 32	0 28·12	33·49	9 36·85	35 15	0 57·99	34·84
			10 0·85	27 3	0 34·17	35·02	9 28·59	38 14	1 8·19	36·78
„ 20	E.	79 12 & 259 12	− 15 40 4·02	31 6	− 8 9·59	− 15 48 13·61	− 15 45 15·85	18 41	− 2 57·22	− 15 48 13·07
			41 31·36	28 12	6 42·84	14·20	45 59·80	16 10	2 12·77	12·57
			47 51·38	6 42	0 22·92	14·30	47 42·76	7 42	0 30·28	13·04
			48 12·21	1 34	0 1·26	13·47	47 8·50	11 12	1 4·13	12·63
			44 40·53	20 28	3 34·59	15·12	38 36·69	33 32	9 37·55	14·24
			43 37·21	23 13	4 36·36	13·57	36 59·58	36 13	11 13·96	13·54
„ 21	W.	158 24 & 338 24	+ 1 10 34·36	6 24	+ 0 1·91	+ 1 10 36·27	+ 1 10 23·19	18 21	+ 0 15·74	+ 1 10 38·93
			10 36·88	3 35	0 0·60	37·48	10 27·69	15 24	0 11·09	38·78
			10 23·33	17 13	0 13·84	37·17	10 34·45	6 3	0 1·72	36·17
			10 16·70	20 40	0 19·94	36·64	10 33·48	8 17	0 3·20	36·68
			9 21·20	40 22	1 15·95	37·15	9 55·79	29 4	0 39·43	35·22
			9 9·57	43 28	1 28·02	37·59	9 48·64	32 8	0 48·18	36·82

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT Interval in Time from Elongation	FACE LEFT Reduction in Arc to Time of Elongation	FACE LEFT Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT Interval in Time from Elongation	FACE RIGHT Reduction in Arc to Time of Elongation	FACE RIGHT Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 21	E.	158 24	− 15 38 3·80	34 43	−10 9·95	− 15 48 13·75	− 15 43 57·92	22 22	− 4 14·08	− 15 48 12·00
		&	39 46·65	31 37	8 26·34	12·99	44 59·43	19 26	3 11·97	11·40
		338 24	47 15·18	10 38	0 57·60	12·78	47 51·24	6 30	0 21·59	12·83
			48 0·85	4 31	0 10·42	11·27	47 26·37	9 22	0 44·86	11·23
			45 19·04	18 25	2 53·75	12·79	40 8·50	30 47	8 6·59	15·09
			44 25·55	21 1	3 46·38	11·93	38 44·24	33 14	9 27·35	11·59
„ 22	W.	237 36	+ 1 10 33·99	8 38	+ 0 3·49	+ 1 10 37·48	+ 1 10 17·90	20 26	+ 0 19·53	+ 1 10 37·43
		&	10 35·49	6 1	0 1·69	37·18	10 24·62	17 7	0 13·71	38·33
		57 36	10 27·51	13 40	0 8·74	36·25	10 37·19	2 11	0 0·22	37·41
			10 24·04	16 32	0 12·78	36·82	10 36·66	4 54	0 1·12	37·78
			10 26·88	38 38	1 9·62	36·50	10 5·07	26 35	0 33·02	38·09
			10 17·38	41 36	1 20·64	38·02	9 56·51	29 34	0 40·83	37·34
„ 22	E.	237 36	− 15 41 5·56	29 0	− 7 6·13	− 15 48 11·69	− 15 45 52·09	16 35	− 2 19·80	− 15 48 11·89
		&	42 33·55	25 51	5 38·87	12·42	46 36·12	13 41	1 35·25	11·37
		57 36	48 2·82	4 29	0 10·23	13·05	47 42·49	7 43	0 30·49	12·98
			48 11·06	2 14	0 2·54	13·60	47 14·86	10 21	0 54·86	9·72
			44 27·14	21 0	3 45·80	12·94	39 39·05	31 40	8 34·66	13·71
			43 35·31	23 18	4 38·19	13·50	37 51·74	34 45	10 20·10	11·84
„ 23	W.	316 49	+ 1 10 30·49	10 58	+ 0 5·62	+ 1 10 36·11	+ 1 10 12·96	23 2	+ 0 24·80	+ 1 10 37·76
		&	10 33·33	8 22	0 3·27	36·60	10 19·75	20 17	0 19·23	38·98
		136 49	10 29·88	11 11	0 5·84	35·72	10 37·16	0 20	0 0·00	37·16
			10 27·47	13 55	0 9·05	36·52	10 36·44	2 52	0 0·38	36·82
			9 35·36	35 54	1 0·11	35·47	10 10·74	23 39	0 26·12	36·86
			9 24·03	39 53	1 14·15	38·18	10 3·91	26 56	0 33·87	37·78
„ 23	E.	316 49	− 15 42 40·68	25 36	− 5 32·28	− 15 48 12·96	− 15 46 45·55	13 2	− 1 26·38	− 15 48 11·93
		&	43 59·68	22 18	4 12·35	12·03	47 14·97	10 21	0 54·47	9·44
		136 49	48 12·43	1 12	0 0·73	13·16	47 21·17	10 2	0 51·42	12·59
			48 13·41	1 2	0 0·54	13·95	46 53·23	12 24	1 18·59	11·82
			44 41·56	20 21	3 32·08	13·64	39 0·17	32 47	9 11·82	11·99
			43 47·58	22 44	4 24·87	12·45	37 34·04	35 16	10 38·85	12·89

Abstract of Astronomical Azimuth observed at XXXIII (Pátharankota) 1877.

1. By Eastern Elongation of β Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	0°	180°	79°	259°	158°	338°	238°	58°	317°	137°
Date	March 19		March 20		March 21		March 22		March 23	
	″	″	″	″	″	″	″	″	″	″
	16·24	12·93	13·61	13·07	13·75	12·00	11·69	11·89	12·96	11·93
Observed difference	13·71	12·59	14·20	12·57	12·99	11·40	12·42	11·37	12·03	9·44
of Circle-Readings,	14·30	13·78	14·30	13·04	12·78	12·83	13·05	12·98	13·16	12·59
Ref. M. — Star	11·84	12·52	13·47	12·63	11·27	11·23	13·60	9·72	13·95	11·82
reduced to Elongation	15·47	14·61	15·12	14·24	12·79	15·09	12·94	13·71	13·64	11·99
	13·61	12·83	13·57	13·54	11·93	11·59	13·50	11·84	12·45	12·89
Means	14·20	13·21	14·05	13·18	12·59	12·36	12·87	11·92	13·03	11·78
	° ′ ″		″		″		″		″	
Means of both faces	− 15 48 13·70		13·61		12·47		12·40		12·40	
Level Corrections	+ 1·52		+ 1·27		+ 1·14		+ 1·33		+ 0·97	
Corrected Means	− 15 48 12·18		12·34		11·33		11·07		11·43	
Az. of Star fr. S., by W.	195 36 55·91		55·68		55·44		55·21		54·97	
Az. of Ref. M. „	179 48 43·73		43·34		44·11		44·14		43·54	

2. By Western Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	0°	180°	79°	259°	158°	338°	238°	58°	317°	137°
Date	March 19		March 20		March 21		March 22		March 23	
	″	″	″	″	″	″	″	″	″	″
	35·29	35·06	34·54	35·41	36·27	38·93	37·48	37·43	36·11	37·76
Observed difference	35·49	36·85	35·54	36·55	37·48	38·78	37·18	38·33	36·60	38·98
of Circle-Readings,	34·27	37·25	34·56	33·94	37·17	36·17	36·25	37·41	35·72	37·16
Ref. M. — Star	35·76	37·69	35·58	35·12	36·64	36·68	36·82	37·78	36·52	36·82
reduced to Elongation	34·53	36·56	33·49	34·84	37·15	35·22	36·50	38·09	35·47	36·86
	35·82	38·64	35·02	36·78	37·59	36·82	38·02	37·34	38·18	37·78
Means	35·19	37·01	34·79	35·44	37·05	37·10	37·04	37·73	36·43	37·56
	° ′ ″		″		″		″		″	
Means of both faces	+ 1 10 36·10		35·12		37·08		37·39		37·00	
Level Corrections	+ 0·97		+ 3·22		+ 0·69		+ 0·95		+ 0·54	
Corrected Means	+ 1 10 37·07		38·34		37·77		38·34		37·54	
Az. of Star fr. S., by W.	178 38 5·18		4·93		4·67		4·42		4·16	
Az. of Ref. M. „	179 48 42·25		43·27		42·44		42·76		41·70	

			° ′ ″
Astronomical Azimuth of Referring Mark	by Eastern Elongation … …		179 48 43·76
	by Western „ … … …		„ 42·48
	Mean … … …		„ 43·12
Angle Referring Mark and XXXII (Kakkrákota) *see pages* 42—F. and 117—F. *ante* …		−	0 8 2·80*
Astronomical Azimuth of Kakkrákota by observation … … … …			179 40 40·32
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 128—F. *ante* … … … … …			179 40 48·01
Astronomical — Geodetical Azimuth at XXXIII (Pátharankota) … … …		−	7·69

* Corrected for Figural and Circuit Errors.

At XLVIII (Manĕgandi)

Lat. N. 9° 46′ 15″·13; Long. E. 78° 57′ 48″·02 = $5^h\ 15^m\ 51^s{\cdot}2$; Height above Mean Sea Level, 56 feet.
February 1876; observed by Major B. R. Branfill with Troughton and Simms' 24-inch Theodolite No. 1.

Star observed	*a* Ursæ Minoris (West).
Mean Right Ascension 1876·0	$1^h\ 13^m\ 20^s$
Mean North Polar Distance 1876·0	1° 21′ 7″·14
Local Mean Time of Elongation, February 13	Western $9^h\ 39^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	Interval in Time from Elongation	Reduction in Arc to Time of Elongation	Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	Interval in Time from Elongation	Reduction in Arc to Time of Elongation	Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Feb. 13	W.	0 2	− 0 38 18·80	36 1	+ 1 0·63	− 0 37 18·17	− 0 37 40·12	23 8	+ 0 25·04	− 0 37 15·08
		&	38 7·32	32 58	0 50·81	16·51	37 34·28	19 53	0 18·50	15·78
		180 2	37 20·68	8 8	0 3·10	17·58	37 19·78	4 0	0 0·75	19·03
			37 19·81	5 11	0 1·26	18·55	37 16·97	6 32	0 2·00	14·97
			37 30·24	16 6	0 12·12	18·12	37 53·76	28 46	0 38·65	15·11
			37 33·07	18 52	0 16·64	16·43	38 1·59	31 32	0 46·43	15·16
„ 14	W.	79 13	− 0 38 53·77	45 32	+ 1 36·79	− 0 37 16·98	− 0 37 54·65	28 59	+ 0 39·28	− 0 37 15·37
		&	38 40·87	42 24	1 23·96	16·91	37 47·68	26 24	0 32·60	15·08
		259 13	37 33·39	18 2	0 15·21	18·18	37 16·96	5 11	0 1·26	15·70
			37 27·66	15 15	0 10·88	16·78	37 14·47	2 16	0 0·24	14·23
			37 20·70	9 10	0 3·93	16·77	37 37·80	21 49	0 22·26	15·54
			37 23·40	12 0	0 6·74	16·66	37 42·24	25 9	0 29·57	12·67
„ 15	W.	158 24	− 0 38 43·83	42 55	+ 1 25·97	− 0 37 17·86	− 0 37 54·37	28 18	+ 0 37·47	− 0 37 16·90
		&	38 32·23	40 16	1 15·70	16·53	37 45·85	25 22	0 30·11	15·74
		338 24	37 26·57	15 14	0 10·86	15·71	37 16·42	2 47	0 0·36	16·06
			37 23·94	12 30	0 7·32	16·62	37 14·74	0 6	0 0·00	14·74
			37 20·32	9 27	0 4·18	16·14	37 42·59	23 39	0 26·14	16·45
			37 24·09	12 20	0 7·11	16·98	37 45·62	26 11	0 32·03	13·59
„ 16	W.	237 37	− 0 38 52·44	44 42	+ 1 33·25	− 0 37 19·19	− 0 38 3·02	32 13	+ 0 48·49	− 0 37 14·53
		&	38 36·30	41 44	1 21·31	14·99	37 51·45	27 33	0 35·47	15·98
		57 37	37 27·96	15 24	0 11·11	16·85	37 14·38	1 18	0 0·08	14·30
			37 19·43	9 26	0 4·17	15·26	37 14·51	4 26	0 0·92	13·59
			37 25·45	14 14	0 9·47	15·98	37 55·35	29 14	0 39·92	15·43
			37 32·12	17 46	0 14·76	17·36	38 2·33	32 28	0 49·22	13·11
„ 17	W.	136 49*	− 0 38 41·08	42 20	+ 1 23·66	− 0 37 17·42	− 0 37 56·74	30 10	+ 0 42·52	− 0 37 14·22
		&	38 28·54	39 39	1 13·42	15·12	37 44·20	25 21	0 30·04	14·16
		316 49*	37 26·91	14 45	0 10·19	16·72	37 15·24	2 29	0 0·29	14·95
			37 23·85	11 55	0 6·65	17·20	37 14·22	2 46	0 0·36	13·86
			37 24·25	12 11	0 6·94	17·31	37 43·61	25 39	0 30·74	12·87
			37 27·73	15 1	0 10·54	17·19	37 51·29	28 25	0 37·72	13·57

* The irregularity of the zero settings was due to a mistake of the observer.

Abstract of Astronomical Azimuth observed at XLVIII (Manĕgandi) 1876.

By Western Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L*	R*
Zero	0°	180°	79°	259°	158°	338°	238°	58°	137°	317°
Date	February 13		February 14		February 15		February 16		February 17	
	"	"	"	"	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	18·17	15·08	16·98	15·37	17·86	16·90	19·19	14·53	17·42	14·22
	16·51	15·78	16·91	15·08	16·53	15·74	14·99	15·98	15·12	14·16
	17·58	19·03	18·18	15·70	15·71	16·06	16·85	14·30	16·72	14·95
	18·55	14·97	16·78	14·23	16·62	14·74	15·26	13·59	17·20	13·86
	18·12	15·11	16·77	15·54	16·14	16·45	15·98	15·43	17·31	12·87
	16·43	15·16	16·66	12·67	16·98	13·59	17·36	13·11	17·19	13·57
Means	17·56	15·86	17·05	14·77	16·64	15·58	16·61	14·49	16·83	13·94
	° ′ "		"		"		"		"	
Means of both faces	— 0 37 16·71		15·91		16·11		15·55		15·39	
Level Corrections	+ 0·56		+ 0·19		+ 0·49		— 0·12		+ 0·01	
Corrected Means	— 0 37 16·15		15·72		15·62		15·67		15·38	
Az. of Star fr. S., by W.	178 38 3·05		2·75		2·54		2·44		2·24	
Az. of Ref. M. „	178 0 46·90		47·03		46·92		46·77		46·86	

		° ′ "
Astronomical Azimuth of Referring Mark or XLVII (Manikamkota)	by Western Elongation	178 0 46·90
Geodetical Azimuth of „	by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 129—F. *ante*	178 0 56·31
Astronomical — Geodetical Azimuth at XLVIII (Manĕgandi)	... ...	— 9·41

* The irregularity of the zero settings was due to a mistake of the observer.

At LVI (Ramnad)

Lat. N. 9° 21′ 51″·96; Long. E. 78° 51′ 44″·84 = 5ʰ 15ᵐ 27ˢ·0; Height above Mean Sea Level, 48 feet.
March 1875; observed by Mr. G. Belcham with Troughton and Simms' 24-inch Theodolite No. 1.

Star observed	α Ursæ Minoris (West).
Mean Right Ascension 1875·0	$1^h\ 12^m\ 59^s$
Mean North Polar Distance 1875·0	1° 21′ 26″·18
Local Mean Time of Elongation, March 18	Western $7^h\ 28^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 18	W.	43 20	−120 40 30·05	30 29	+0 43·65	−120 39 46·40	−120 39 53·11	15 15	+0 10·93	−120 39 42·18
		&	40 22·42	26 22	0 32·66	49·76	39 49·38	12 56	0 7·86	41·52
		223 20	39 47·84	4 24	0 0·91	46·93	39 46·48	7 39	0 2·75	43·73
			39 50·16	1 22	0 0·09	50·07	39 49·13	10 24	0 5·08	44·05
			40 3·44	19 9	0 17·23	46·21	40 27·58	30 35	0 43·89	43·69
			40 9·97	21 34	0 21·85	48·12	40 33·60	32 34	0 49·76	43·84
			41 2·24	40 14	1 15·86	46·38	41 34·89	48 33	1 50·32	44·57
			41 8·73	42 5	1 22·97	45·76	41 41·15	50 24	1 58·85	42·30
„ 19	W.	122 16	−120 41 21·89	45 10	+1 35·67	−120 39 46·22	−120 40 43·88	36 7	+1 1·24	−120 39 42·64
		&	41 14·61	43 23	1 28·29	46·32	40 38·20	34 25	0 55·62	42·58
		302 16	40 24·66	27 39	0 35·92	48·74	39 59·85	19 34	0 17·99	41·86
			40 18·63	25 57	0 31·64	46·99	39 58·02	18 0	0 15·23	42·79
			39 53·59	11 13	0 5·91	47·68	39 44·97	3 56	0 0·73	44·24
			39 51·53	9 40	0 4·39	47·14	39 41·47	2 28	0 0·29	41·18
			39 49·19	3 33	0 0·59	48·60	39 52·17	12 38	0 7·51	44·66
			39 49·00	5 16	0 1·31	47·69	39 51·60	14 14	0 9·53	42·07
„ 20	W.	201 27	−120 41 44·24	50 22	+1 58·91	−120 39 45·33	−120 40 43·76	35 38	+0 59·63	−120 39 44·13
		&	41 28·59	46 57	1 43·37	45·22	40 33·74	32 32	0 49·72	44·02
		21 27	40 11·86	23 12	0 25·30	46·56	39 52·60	12 11	0 6·98	45·62
			40 6·90	20 51	0 20·44	46·46	39 48·14	9 26	0 4·19	43·95
			39 46·36	0 11	0 0·00	46·36	39 51·06	11 30	0 6·22	44·84
			39 46·67	3 4	0 0·44	46·23	39 51·86	14 10	0 9·43	42·43
			40 10·78	24 15	0 27·62	43·16	40 47·29	36 19	1 1·85	45·44
			40 20·24	26 40	0 33·38	46·86	41 3·34	39 54	1 14·62	48·72
„ 21	W.	280 40	−120 42 10·37	55 33	+2 24·55	−120 39 45·82	−120 41 13·84	43 45	+1 29·81	−120 39 44·03
		&	41 58·39	52 51	2 10·90	47·49	41 2·21	40 46	1 18·01	44·20
		100 40	40 22·71	28 48	0 38·98	43·73	39 55·19	16 37	0 12·99	42·20
			40 19·00	26 5	0 31·98	47·02	40 8·84	23 22	0 25·64	43·20
			40 32·29	31 58	0 47·94	44·35	41 23·86	46 12	1 39·94	43·92
			40 40·04	34 22	0 55·39	44·65	41 32·94	48 26	1 49·80	43·14

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 22	W.	359 52 & 179 52	−120 40 32·18	31 44	+ 0 47·29	−120 39 44·89	−120 40 3·02	20 34	+ 0 19·87	−120 39 43·15
			40 25·84	28 49	0 39·00	46·84	39 57·48	18 24	0 15·91	41·57
			39 51·46	9 21	0 4·11	47·35	39 50·68	12 3	0 6·82	43·86
			39 46·41	6 31	0 1·99	44·42	39 53·36	14 38	0 10·05	43·31
			40 9·88	22 16	0 23·27	46·61	40 29·94	31 34	0 46·73	43·21
			40 14·31	24 39	0 28·52	45·79	40 36·89	33 41	0 53·20	43·69
			41 4·59	41 19	1 19·97	44·62	41 47·27	51 40	2 4·85	42·42
			41 15·85	43 44	1 29·57	46·28	41 56·19	53 37	2 14·41	41·78

Abstract of Astronomical Azimuth observed at LVI (Ramnad) 1875.

By Western Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	43°	223°	122°	302°	201°	21°	281°	101°	0°	180°
Date	March 18		March 19		March 20		March 21		March 22	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. – Star reduced to Elongation	46·40	42·18	46·22	42·64	45·33	44·13	45·82	44·03	44·89	43·15
	49·76	41·52	46·32	42·58	45·22	44·02	47·49	44·20	46·84	41·57
	46·93	43·73	48·74	41·86	46·56	45·62	43·73	42·20	47·35	43·86
	50·07	44·05	46·99	42·79	46·46	43·95	47·02	43·20	44·42	43·31
	46·21	43·69	47·68	44·24	46·36	44·84	44·35	43·92	46·61	43·21
	48·12	43·84	47·14	41·18	46·23	42·43	44·65	43·14	45·79	43·69
	46·38	44·57	48·60	44·66	43·16	45·44			44·62	42·42
	45·76	42·30	47·69	42·07	46·86	48·72			46·28	41·78
Means	47·45	43·24	47·42	42·75	45·77	44·89	45·51	43·45	45·85	42·87
	° ′ ″		″		″		″		″	
Means of both faces	−120 39 45·34		45·09		45·33		44·48		44·36	
Level Corrections	+ 1·55		+ 0·55		+ 1·38		+ 0·08		+ 0·21	
Corrected Means	−120 39 43·79		44·54		43·95		44·40		44·15	
Az. of Star fr. S., by W.	178 37 39·43		39·13		38·82		38·42		38·11	
Az. of Ref. M. „	57 57 55·64		54·59		54·87		54·02		53·96	

		° ′ ″
Astronomical Azimuth of Referring Mark or LVIII (Uttarakoshamangai)	by Western Elongation	57 57 54·62
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 129—F. *ante*	... ...	57 58 2·59
Astronomical — Geodetical Azimuth at LVI (Ramnad)	... ... —	7·97

June, 1888.

S. G. BURRARD,
In charge of Computing Office.

PRINCIPAL TRIANGULATION—SOUTH-EAST COAST SERIES.

Fig. No. 55

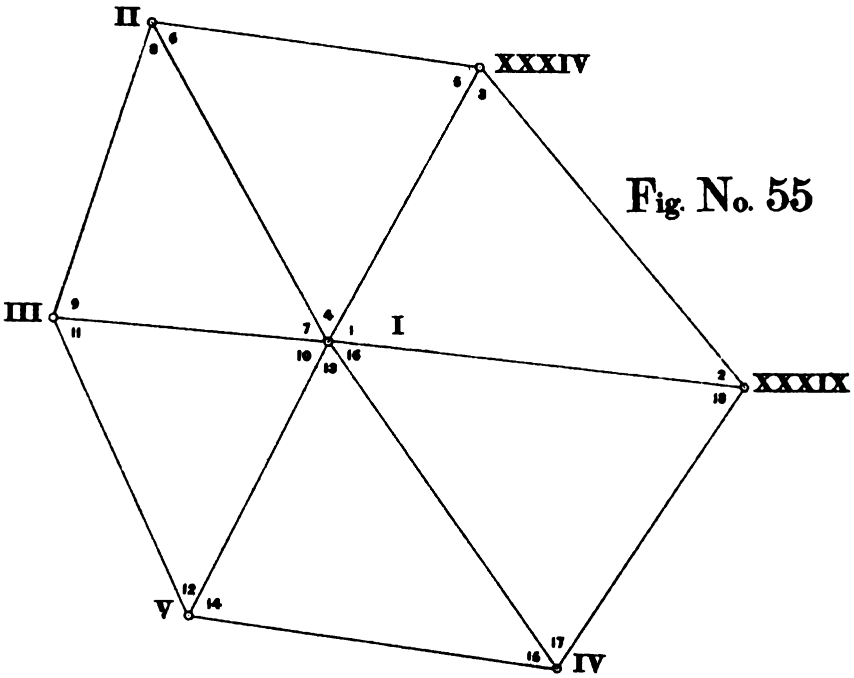


Fig. No. 56

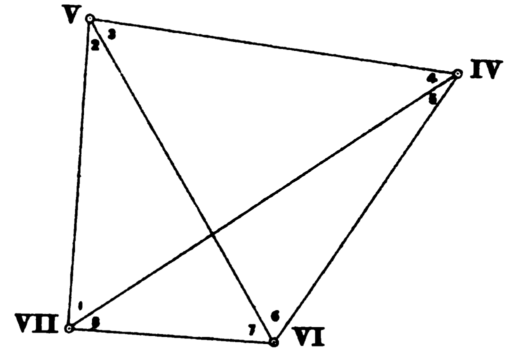


Fig. No. 57

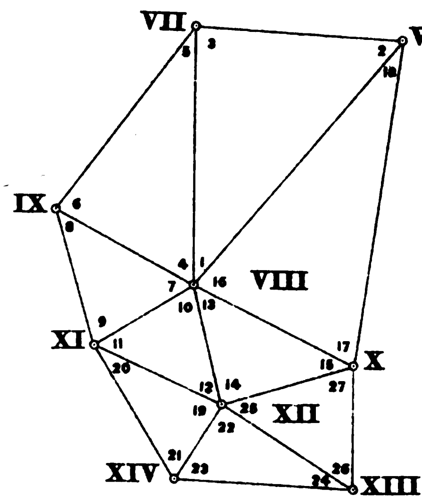
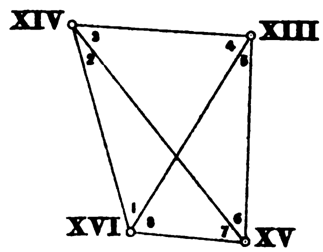


Fig. No. 58



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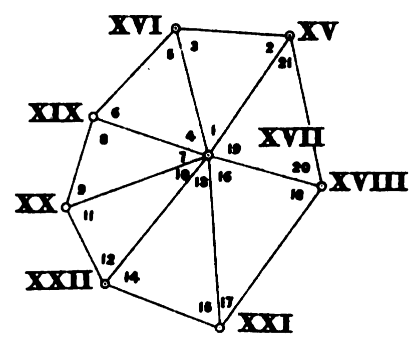

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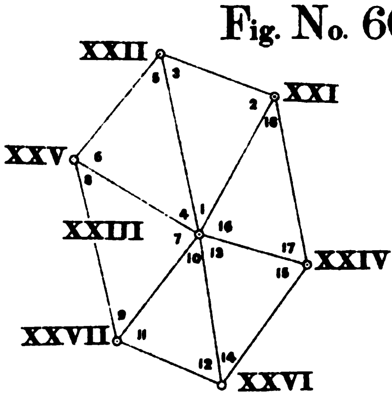

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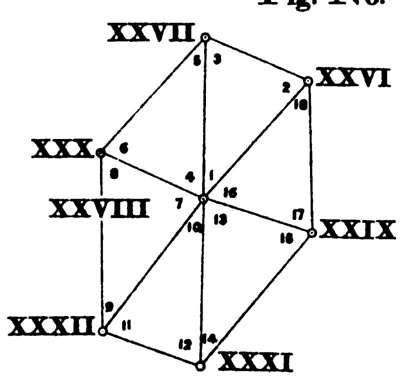
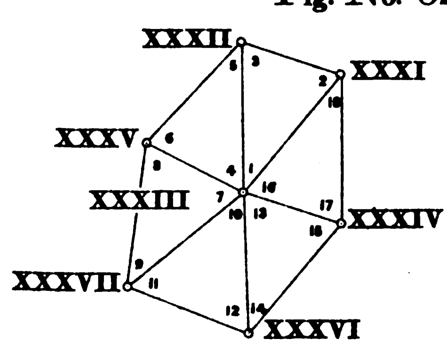


Fig. No. 62



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, February 1889.

PRINCIPAL TRIANGULATION—SOUTH-EAST COAST SERIES

Fig. No. 63

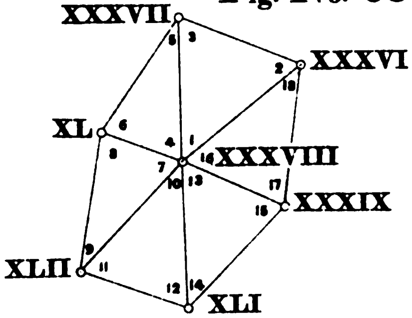


Fig. No. 64

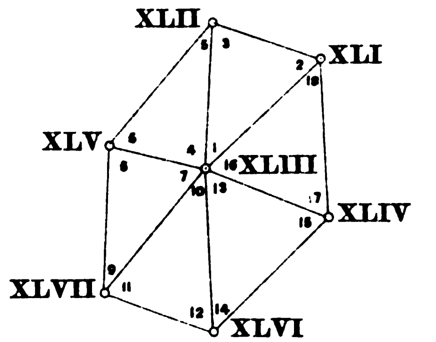


Fig. No. 65

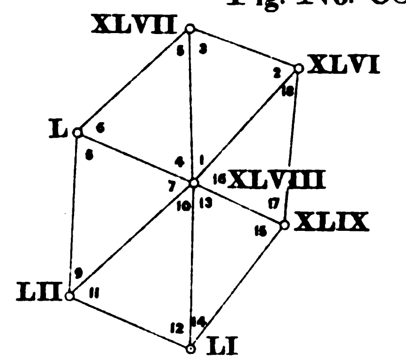


Fig. No. 66

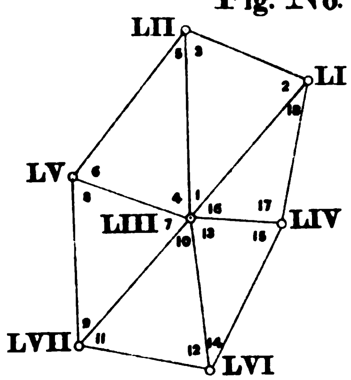
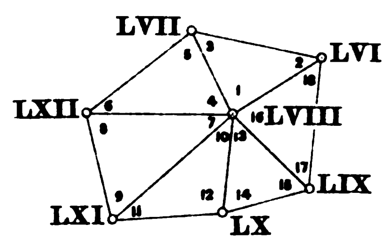


Fig. No. 67



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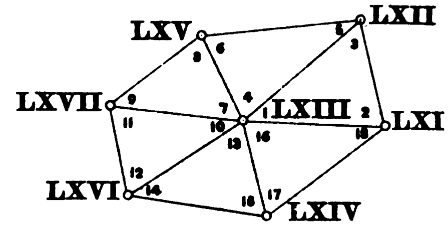

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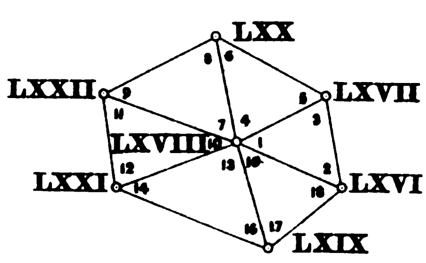


Fig. No. 70

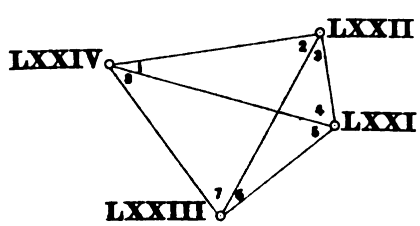
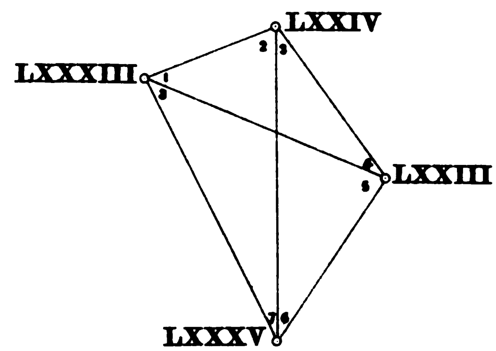


Fig. No. 71



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, January 1880.

PRINCIPAL TRIANGULATION.

CEYLON BRANCH SERIES OF THE SOUTH-EAST COAST SERIES.

Fig. No. 82

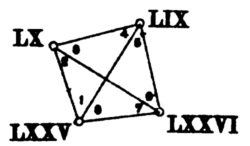


Fig. No. 83

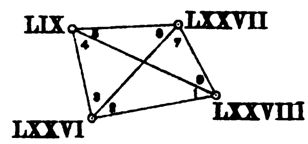


Fig. No. 84

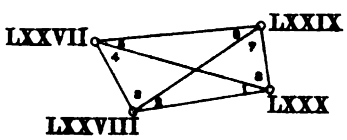


Fig. No. 85

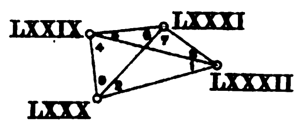
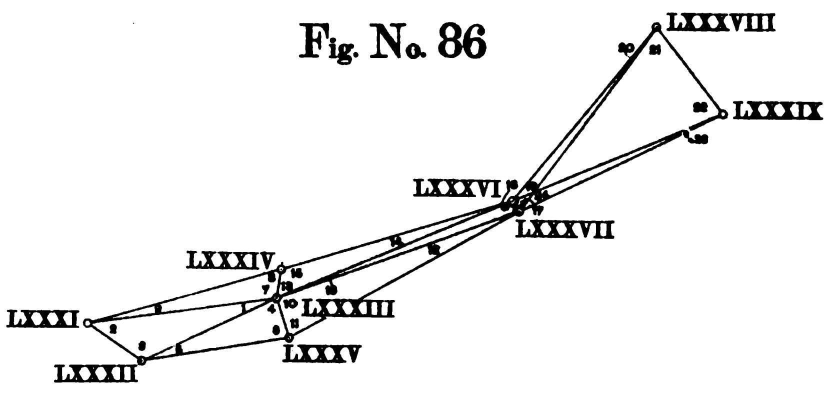


Fig. No. 86



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, June 1880.

MADRAS LONGITUDINAL SERIES.

MADRAS LONGITUDINAL SERIES.

INTRODUCTION.

This Series, as first executed, originated from the westernmost side (Pullúr H.S.–Anandalamalai H.S.) of the Kurumkota polygon of the Madras Meridional Series and extended to Mangalore on the West Coast. But in the final arrangement of the triangulation the Kurumkota polygon and the triangulation to the east connecting it with Madras, have been transferred to the longitudinal series, and the triangulation about Bangalore (Bĕngalúr) has been considered as appertaining to the Great Arc Series; so that the Madras Longitudinal Series now consists of two nearly equal portions separated by the Great Arc. In the following historical account it will however be convenient to describe the whole of the work as it was executed.

Season 1864-65.

PERSONNEL.

Captain B. R. Branfill, Bengal Cavalry, 1st Asst.
Mr. F. Ryall, Sub-Assistant, 1st Class.
„ J. W. Mitchell, „ 2nd „
„ J. R. L. O'Neill, „ 3rd „

The portion of the triangulation which has been transferred from the meridional series, was executed by Captain Branfill in 1864-65 while conducting the operations of that series. It was then a matter of considerable importance to connect the modern triangulation with the Madras Observatory, the primary origin of all longitudes in India. This observatory had been adopted by Colonel Lambton as his origin, and although Colonel Everest had selected, as more convenient, a second origin at Kaliánpur, its longitude was obtained from Madras through the triangulation then existing. As will be seen on reference to the Note at the end of this Introduction, that triangulation was inferior to the more modern; and by connecting Kaliánpur with the Madras Observatory by the modern triangulation, a more accurate determination of the difference of longitude of the two origins was to be obtained. It was not then in contemplation to determine longitudes by help of the Electric Telegraph, and it was therefore the more necessary that the triangulation should be connected with the Madras Observatory. There is no other observatory in India in which systematic observations for determining the longitude have been taken over a series of years; consequently the same necessity existed for the accurate connection of the Indian triangulation with the Madras Observatory, as for that of the British triangulation with the Greenwich Observatory, the origin of all English longitudes.

So soon therefore as the modern triangulation approached Madras, arrangements were made for the erection of a pillar at the Madras Observatory, of sufficient height to overcome the obstructions offered by the surrounding houses and gardens, from which to connect the observatory with the principal triangulation. This proceeding was readily agreed to by the Government Astronomer and sanctioned by the Madras Government; and as no Officer of the Survey Department could be spared to superintend the work, it was undertaken by the Public Works Department; but through sundry misunderstandings and unforeseen delays it was not completed until the 6th of June.

It unfortunately happened that several trees intervened between the nearest stations of the triangulation and the Madras Observatory, and on attempting to clear a line through them such extravagant compensation was demanded—*e. g.*, Rs. 300 for a single branch of a casuarina tree—that it was necessary to suspend the triangulation until the theodolite could be raised to a sufficient height on the observatory to overlook the intervening trees. "Here "again", writes Lieut.-Colonel Walker, the Superintendent of the Great Trigonometrical Survey, "the want of legal powers for our officers was productive of much embarrassment "and delay; and it is worthy of notice, that the operations of this Department are "carried on with far greater rapidity and economy in the wildest regions, where the "physical obstacles are greatest, than in the vicinity of the Presidency towns, where they "are least; in these towns, the head-quarters of the lawyers, a few cantankerous individuals "are always to be met with, whom it is more difficult to manage than to combat any physical "obstacle."

An observatory in which was an equatorial instrument occupied the roof of the Government Astronomer's house, the instrument stood on a granite slab fixed on cross walls 33 feet from the ground. It was removed and a hollow pillar of masonry was raised 30 feet in height above the slab to receive the stand of Captain Branfill's theodolite, which was thus mounted 63 feet above the ground level. A scaffolding was raised round the pillar for the observer and his assistants to stand on, and to carry the observatory tent: it had to be constructed of the lightest possible materials, and was therefore somewhat fragile and dangerous; fortunately the weather was favorable, and the observations were completed in two days without misadventure.

The Madras party arrived in Madras on the 29th of May and in the first week of June work was commenced at the observatory; the pillar station was connected with the Meridian Circle, and the difference of height between the pillar station and the Public Works Department Bench-mark below was determined.

Messrs. Ryall and O'Neill had continued at their work until the Chĕmbedu tower was finished and the ray thence to the Madras Observatory cleared of obstructions, but they were then both attacked with fever and went into hospital.

On the 9th of June the 24-inch theodolite was hoisted in its case, on to the roof of the Astronomer's dwelling, and on the 10th by means of a second hoist, it was raised to the top of the pillar and scaffold. Final observations were concluded on the 12th of June, and with them was completed the triangulation along the coast, connecting Vizagapatam and Madras. The instrument was lowered to the roof the same evening, and next day to the ground without accident. In spite of unusual annoyances and difficulties to which he had been exposed, and very bad health, Captain Branfill's out-turn of work during this field season was considerable. During the season 7 triangles were completed, extending a direct distance of 58 miles, besides 17 triangles extending a distance of 78 miles on the meridional series.

Season 1865-66.

PERSONNEL.

Captain B. R. Branfill, Bengal Cavalry, 1st Asst.
Mr. A. W. Donnelly, Civil Assistant, 4th Grade.
„ F. Ryall, Sub-Assistant, 1st Class.
„ J. W. Mitchell, „ 2nd „
„ J. R. L. O'Neill, „ 3rd „

In 1865 Colonel Walker decided to continue the triangulation westwards to connect the Madras Observatory and the Bangalore Base-line. He assigned the work to Captain Branfill's party, which was recessing at Bangalore at the time. The party took the field on the 26th of December 1865, and commenced the triangulation proper. The work originated from the side Anandalamalai H.S.–Pullúr H.S., the western side of the Kurumkota polygon, the value of which had been brought down and fixed by the Madras Meridional and Coast Series in the previous season.

Colonel Lambton had executed a net-work of triangulation which covered the whole country round as far as Bangalore to the west; he had also joined Bangalore to Mangalore (Mangalúr) by a longitudinal series. Although this had been done at the beginning of the century, the information derived from his results, was very valuable, and greatly facilitated the selection of the stations for the Madras Longitudinal Series. Mr. Donnelly proceeded in advance of the party to examine and prove the provisional series, with orders to build the stations, as soon as fixed, with the least possible delay. The first polygon, Batinkŏnda, extended to the Páyanghát, or foot of the Eastern Gháts, skirting the Mysore (Maisúr) plateau, and dividing Mysore from the Carnatic (Karnatik). The country then became difficult, and rendered it necessary to adopt a somewhat small and unsymmetrical pentagon, that of Devarakŏnda, and in the first figure on the plateau, the Bandapalle hexagon, to use longer rays than desirable. After having visited and built 5 stations of the Bandapalle hexagon, Mr. Donnelly discovered that he had admitted an angle of about 27°, which necessitated some sort of a change in the figure. Without the use of short sides or tower stations, this difficulty could only be solved by the rejection of Kurudamale H.S., and the adoption of Rájugundlapalle H.S., 18 miles to the north, a change which was immediately carried out. Advantage was taken of the delay, ensuing on this change, to complete the secondary triangulation for determining the position of the Pulicat (Paraverkádu) Light-house.

On resumption of the observations of the Bandapalle polygon, the haziness of the weather gave great trouble, particularly at the new station of Rájugundlapalle. On this account, although the observations at the latter station were very fairly accordant *inter se*, there were found to exist the large resulting triangular errors of $-4''\cdot3$ and $+3''\cdot4$ in the two triangles adjoining the ray Rájugundlapalle and Bandapalle, which grazes, but not very closely, over the rocky ridge of the rejected hill Kurudamale. These triangles were therefore not accepted, and in the following season, the angles to and from Kurudamale, which were not liable to be affected by the troublesome phenomenon of lateral refraction, were observed.

In this season, 1865-66, almost the whole of the Series was completed as far as Bangalore by a chain of 23 principal triangles, forming 3 hexagons and a pentagon, covering an area of about 2650 square miles, and extending a direct distance of 118 miles. All the members of the party suffered more or less from illness, resulting from exposure and malaria, and Captain Branfill was obliged to proceed to Europe on sick leave; his place in charge of the party was taken by Lieutenant W. M. Campbell, R.E.

Season 1866-67.

PERSONNEL.

Lieut. W. M. Campbell, R.E., Asst. Surveyor, 1st Grade.
Mr. A. W. Donnelly, Civil Assistant, 4th Grade.
„ F. W. Ryall, Sub-Assistant 1st Grade.
„ J. W. Mitchell, „ 2nd „
„ O. V. Norris, „ 4th „
„ C. D. Potter, „ „ „

It had originally been the intention of Colonel Walker, only to carry this Series as far as the meridian of Bangalore, to meet it there by a series of triangles from Mangalore which were to be executed by another party, and to employ Captain Branfill's party on its arrival at Bangalore on the revision of the Southern Section of the Great Arc. Owing however to some misunderstanding, Captain Branfill believed that his party were intended to work westward to the Coast; accordingly, at the close of the field season of 1865-66, he had one polygon prepared for observation to the west, but no arrangements made to the south for work on the Great Arc. On being informed of this, Colonel Walker sanctioned the completion of this polygon, before commencing operations to the south on the Great Arc. He directed that arrangements should be made for the re-measurement of the old base-line measured by Colonel Lambton in 1804 in the neighbourhood of Bangalore.

Messrs. Donnelly and Mitchell took the field in November, the former to make the required arrangements for the base-line and the latter to carry on preliminary operations to the south along the meridian of the Great Arc. Lieutenant Campbell himself was detained in Madras till January owing to some alterations which were required in the 24-inch theodolite. He commenced work on the 2nd of that month at Halasúrbĕtta H.S., and continued it without intermission till the 10th May, carrying the series under review to the side Hemagiri H.S.–Rangaswámibĕtta H.S. and also executing a portion of the Great Arc Series. The triangulation of the Series was thus only extended in 1866-67 to a point 40 miles west of Bangalore.

Lieutenant Campbell found the difficulties in the way of re-measuring Colonel Lambton's base so great that he was compelled to advise its abandonment, and he was accordingly directed to select another site: this he did, and at the same time made arrangements to connect Colonel Lambton's base by triangulation.

Season 1867-68.

PERSONNEL.

Lieut. W. M. Campbell, R.E., Surveyor, 3rd Grade.
Mr. A. W. Donnelly, Civil Assistant, 4th Grade.
„ J. W. Mitchell, Sub-Assistant, 2nd „
„ O. V. Norris, „ 4th „
„ C. D. Potter, „ „ „

In 1867-68 little progress was made, because Lieutenant Campbell and his assistants were employed for the greater portion of the field season in the operations connected with the measurement of the Bangalore Base-line, which have been described in the Introduction to the Great Arc Series, Section 8° to 18°. As soon as these were completed, Lieutenant Campbell took up the triangulation at the point west of Bangalore, where it had stopped the year before, Mr. Mitchell having been sent to carry on the approximate work of the longitudinal series to the west while the party was engaged on the Bangalore Base-line. An approximate series had been executed some years previously by an assistant of the Bombay party, who selected stations of the Mangalore Meridional Series, down to the latitude of Mangalore, where he converted it into a longitudinal series, and carried his triangles eastwards as far as Bangalore. Unfortunately, however, it was now found that the series so selected did not admit of symmetrical connection with that already finally brought up from Madras, (as far as Hemagiri H.S.–Rangaswámibĕtta H.S.) without further complicating the compound figure surrounding the Base-line, already so extensive as to involve great labor in reduction.

Mr. Mitchell, disregarding therefore the existing approximate series, succeeded in selecting two new polygons. The first of these gave a good deal of trouble, owing to the nature of the ground. The second was a large figure covering upwards of 2000 square miles of country. A third polygon was partially chosen, which was intended to close on the approximate triangulation of the Mangalore Meridional Series: the two flank stations of this polygon could not be definitely fixed, but it was seen that no difficulty would be experienced in finding appropriate points.

The measurement of the Bangalore Base-line was completed on the 12th of March, and on the 24th Lieutenant Campbell's party moved westwards to take up the principal triangulation. One hexagonal figure, covering an area of 925 miles, and extending the series 33 miles in length, was completed on the 3rd of May, when the party commenced its return march to Bangalore. Whilst making this march, Lieutenant Campbell had an opportunity for visiting one of the most interesting features of Mysore, *viz.*, the gigantic Jain statue of "Shravan Bellagula," cut out of the living rock (gneiss) on the summit of a hill, some 800 feet above the surrounding country, from which it is visible for miles in every direction. It is the figure of a man, standing up clear of the summit of the rock from a little above the middle of his thighs, while from that point downwards the legs are shewn in strong relief, about half their thickness being sculptured on the face of the rock. Lieutenant Campbell writes:—"For native sculpture, the proportions are not very "bad, but all horizontal dimensions are exaggerated, and the legs are dwarfed in height, as "compared with the upper part of the body. The arms hang clear of the body from the "shoulder to the wrist. The stone is cut smooth and partially polished, and the color is so "white a grey, as to give the appearance of whitewash at a distance of 3 or 4 miles. With a "small theodolite, I took the following dimensions of the figure, as accurately as the situation "admitted:—

	Feet	Inches
Height of upper part, entire form cut out	39	0
„ lower part, only half moulded	21	6
Entire height of figure	60	6
Width of shoulder	27	0
„ head	10	0
„ waist	10	4
between armpits	14	2

"An inscription on the foot of the statue states that it was erected by Chamunda Raya, "whom tradition places about 60 B. C. According to the most reasonable hypothesis, the "statue must have been cut out of a rock which projected above the hill. The workman-"ship is still as sharp as if the stone had been newly cut."

After the field season of 1867-68, the Madras Longitudinal Series remained in abeyance for three years, the party being first engaged in the measurement of the Cape Comorin Base-line and afterwards being employed for two field seasons on the southernmost section of the Great Arc Series. In 1871-72 it resumed work on the Longitudinal Series.

Season 1871-72.

PERSONNEL.

Major B. R. Branfill, Dy. Supt., 2nd Grade.
Lt. J. R. McCullagh, R.E., Asst. Supt., 1st Grade.
Mr. J. W. Mitchell, Asst. Surveyor, 1st "
" O. V. Norris, " 2nd "
" C. D. Potter, " 3rd "
" E. W. Lasseron, " 4th "

On November 10th 1871, the party left Bangalore and reached Nughallibĕtta H.S. on the 17th and 18th, marching in two parties for the sake of observing a Barometic Levelling traverse, by means of corresponding simultaneous observations with two pairs of aneroids—the result of which, notwithstanding the unfavorable state of the weather, proved highly satisfactory, the closing error being only about 7 feet.

At Nughallibĕtta H.S. Major Branfill commenced operations by observing an azimuth to δ Ursæ Minoris at Western Elongation and 51 Cephei at Eastern Elongation. A serious delay was met with at Sátanhalli H.S., the central station of the first polygon, where, after some days of fruitless efforts to obtain a signal from Desáni H.S., the north flank station, the ray proved impracticable, being obstructed by a large portion of the top of an intervening hill. A new point on the Desáni group of hills was selected, but this failure of the approximate series cost no less than ten days of the best weather for observing. The principal observations were then carried on without further hindrance than that caused by the forests and mountainous country of the Malnád and Western Gháts, in which clouds and heavy mists frequently obscured the signals; moreover the distances traversed between each station were very great, occupying eight days on the average, and as many as twelve in two cases. About the end of January, whilst observations were in progress at Pushpagiri H.S., Mr. Potter discovered that the approximate series had again failed, the hill station of Kudurĕmukha proving invisible. This caused a delay of three weeks.

Leaving Lieutenant McCullagh to take the principal observations, Major Branfill in the middle of February set out to recast the approximate series, which had been selected by Mr. John McGill, who had been working southwards on the Mangalore Meridional Series. The figures provided were somewhat small and ill-conditioned, and the number of stations had to be reduced to ensure the completion of this triangulation in the following field season. Major Branfill determined to remodel the Series in advance, by throwing back (eastward) the side of junction, and selecting a figure to the north-east of Kudurĕmukha above the Gháts, that would, as it were "cut off the corner." Mangalore was fixed by two single triangles, which during the next season were converted into a quadrilateral figure by the observation of the diagonal ray.

Meanwhile and till the end of the season, Lieutenant McCullagh with the main party had been greatly impeded in his observations by the hazy weather setting in. At Ballamale, the south-western flank station, he was detained 15 days, at Ammĕdikal 18 days, and at Kudurĕmukha 25 days, until the 10th of May when, as there was no hope of completing the observations before the beginning of the monsoon, he closed the season's observing and marched to Bangalore, where the party arrived on the 28th of May, having suffered much latterly from fever.

During this season the Madras Longitudinal Series was extended 110 miles to the west, and carried over the Western Ghâts. The principal triangulation that was executed covered an area of 3240 square miles.

Major Branfill was occupied during a part of the field season in the attempt to set up a self-registering tide gauge at Mangalore. The river Nĕtrávati which runs northwards past the town of Mangalore, is separated from the open sea for several miles by a spit of sand, varying in width from 100 to 400 yards, and 10 or 12 feet above sea level in the highest parts. It appeared that this spit had been extending northwards for several years, driving the river mouth and bar continually before it. The older parts of the sand spit were covered with a growth of sea pink and many other plants, and were apparently very firm and not liable to shift. Some years before, a breach had been cut in the spit to allow the river to enter the sea direct and a little south of the town instead of flowing round the spit which extended a mile from the cut; but a very few tides sufficed to fill up the gap. From this and other local information there seemed good reason to suppose that the sand spit might be considered more than sufficiently permanent for a year's tidal observations. Major Branfill therefore had a masonry well sunk in the highest part of the spit, where it was 12 feet above sea level and 30 yards away from high water mark on the beach, about a mile south of the river mouth and nearly opposite the town of Mangalore. The sand was very firm at a small depth below the surface but very "quick" at the permanent water level below, which appeared, however, to be considerably higher than mean sea level. The well was sunk until there was always a depth of 6 feet or more of water in it and 10 feet of masonry above high water mark.

Communication was next established with the open sea by means of wrought iron gas piping; but owing to the persistent high level of the water in the well, a watertight cistern had to be introduced which should only admit or deliver the sea water by means of the pipe. This was effected with much difficulty; but bad weather set in almost immediately and the water shoaled and covered the sea end of the pipe with about a foot of sand.

Meanwhile the self-registering tide gauge had been set up. A severe gale now occurred which considerably altered the shore line, washing away much of the sand spit almost up to the observatory and well and shoaling the water for some distance out to sea. A continuance of bad weather rendered it necessary to dismantle the observatory, but not before damage and loss had occurred from the violence of the waves.

Major Branfill, after his experience, came to the conclusion that to set up a tidal observatory and maintain it in operation for a twelvemonth on the sandy shore of the open coast, is an affair of such difficulty and expense and at best so uncertain of success that it can hardly be recommended. Mangalore was accordingly abandoned as a tidal station.

In November and December 1869, Captain J. P. Basevi, R.E., who was then conducting Pendulum Observations determined the sea level at Mangalore by a month's observations of high and low water, and referred it by levelling to some permanent masonry buildings. Mr. Norris was directed to connect these with the Principal Station of Mangalore, and found its height thereby to be 186 feet above mean sea level: the trigonometrical value derived from Madras is 196 feet, and therefore a closing error of 10 feet has been generated in the heights of the Series.

Season 1872-73.

PERSONNEL.

Major B. R. Branfill, Deputy Supt., 2nd Grade.
Lt. J. R. McCullagh, R.E., Asst. Supt., 1st „
Mr. J. W. Mitchell, Asst. Surveyor, 1st Grade.
„ O. V. Norris, „ 2nd „
„ C. D. Potter, „ „ „
„ E. W. Lasseron, „ 3rd „

Only a few angles now remained to be observed on the Madras Longitudinal Series; and the party was directed in 1872-73 to resume the Mangalore Meridional Series, to carry it south to its junction with the Madras Longitudinal Series and to complete the latter. This involved a large amount of work; but by entering the field early and pushing on with rapidity, both Series were brought to a successful conclusion. Further Major Branfill took a complete set of circumpolar star observations for azimuth at Mangalore to α Ursæ Minoris at Western Elongation, a second 24-inch theodolite having been sent round by steamer from Calcutta for the purpose, which was returned on conclusion of the observations.

On the completion of the South-East Coast Series in 1879-80 in the vicinity of Madras, Colonel Branfill added two pentagons to the Madras Longitudinal Series, in order to provide stations, as near as practicable to the Madras Observatory, at which astronomical observations for azimuth might be taken, partly for the verification of the azimuth and partly to throw light on the probable amount of the local attraction in the direction of the prime vertical on the coast line. Azimuths were observed at St. Thomas's Mount and at Injambákam Stations.

On the completion of the Simultaneous Reduction of the Southern Trigon it was found that the undermentioned errors had been actually dispersed over the two sections of the Madras Longitudinal Series:—

Section W. of the Great Arc Meridional Series.

In Latitude	... ...	+ 0″·080
„ Longitude	... ...	− 0 ·010
„ Azimuth	... ...	+ 0 ·141
„ Side	Log feet	− 0 ·000, 0014,7 = 0·22 of an inch per mile.

Section E. of the Great Arc Meridional Series.

In Latitude	... ...	− 0″·051
„ Longitude	... ...	− 0 ·019
„ Azimuth	... ...	+ 1 ·341
„ Side	Log feet	− 0 ·000, 0006,4 = 0·09 of an inch per mile.

Secondary Triangulation.

During seasons 1865-66 and 1866-67 scarcely any secondary work was executed beyond the fixing the positions of a few points from principal stations.

In April and May 1868 a first class Secondary Series, starting from the side Adhibĕtta–Náráyandurga and fixing the positions of points in and about Sĕringapatam and Mysore, was executed by Mr. A. Christie, Sub-Assistant Surveyor 3rd grade, with a 12-inch theodolite and luminous signals. Horizontal and vertical angles were taken at 10 stations fixing the positions of 30 stations and points and the heights of 13 of them.

In 1871-73, a considerable amount of secondary triangulation was thrown off from the principal sides, by which the positions of about 130 conspicuous points were determined. And between the years 1871-74, a first class Secondary Series of 13 triangles was carried southwards by Mr. Mitchell from the side Muchil H.S.–Pushpagiri H.S., along the coast for a distance of 140 miles to Kurnád h.s.–Anangamalai h.s. (near Pŏnáni) the northernmost side of Colonel Lambton's minor triangulation from Cape Comorin along the Malabar Coast. As however there was some doubt of the identity of Kurnád with that of Colonel Lambton, the tract was revisited early in 1880 by Colonel Branfill who effected a satisfactory junction by actually finding and connecting by triangulation the station marks at Pŏnmalai and Álatúr, both of which he believed to be identical with Colonel Lambton's stations.

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S. G. BURRARD.

Note on the connection of the Madras Observatory with the Principal Triangulation.

The origin to which Colonel Lambton referred the Longitudes of all stations of the triangulation of Southern India was the centre of the Meridian Circle of the Madras Astronomical Observatory; and its longitude as determined by observations taken in 1815, was accepted as 80° 17′ 21″ East of Greenwich. But about the year 1840 Colonel Everest adopted a point in his observatory at Kaliánpur in Central India as a second origin of Longitude, its value 77° 41′ 44″·75 East of Greenwich being obtained as follows:—

The Longitude of Madras Observatory		80°	17′	21″
Dámargída West of the Madras Observatory by Colonel Lambton's Operations	—	2	34	49 ·64
Kaliánpur West of Dámargída by Colonel Everest's Operations	—	0	0	46 ·61
The Longitude of Kaliánpur Observatory		77	41	44 ·75*

Much of the triangulation employed in the deduction of this value of longitude had been executed with inferior instruments, and was based on the primary chain-measured base-lines of this Survey: all this has since been revised, and also computed in terms of the modern base-lines, measured with the Colby apparatus of compensation bars and microscopes. But prior to the completion of this revision, the final reduction of the principal triangulation was undertaken; and it was found necessary to commence with that of the North-West Quadrilateral for reasons which are stated in Sections 2 and 7 of Chapter I of Vol. II of the *Account of the Operations &c.* This led to the retention of Colonel Everest's adopted origin of Kaliánpur as the origin of Longitudes.

The final reduction of all the principal triangulation between Kaliánpur and Madras has now been effected, and it is desirable to shew the steps that were taken to re-connect the Madras Observatory by modern triangulation and to ascertain its longitude relatively to Kaliánpur as adopted by Colonel Everest.

In the first place it is desirable to make certain as far as possible that there is no mistake about the position, as at present assumed, of Lambton's origin of longitude. The evidence

* See Section 3, Chapter XI, Volume II of the *Account of the Operations of the Great Trigonometrical Survey of India.*

is unfortunately very meagre, but such as exists is here given. Major (now Colonel) B. R. Branfill—who effected the modern connection—writes to the Superintendent G. T. Survey under date 12th September 1871:—"As I could obtain no documentary evidence on the "subject, I accepted Mr. Pogson's (the Government Astronomer's) assurance that the centre "of the Meridian Circle was the point to connect, as the origin of the Astronomical Longitude; "and it was in all probability the same point that had previously been used for the same "purpose, and therefore most likely the point referred to by Colonel Lambton."

In 1873 Captain (now Major General) W. M. Campbell, R.E., being at Madras, was requested by the Superintendent G. T. Survey to make further enquiries, and he replied as follows:—"The present Meridional Circle is *probably* on the same meridian as the old one, "which was the origin of Lambton's longitudes, and cannot be more than 6 or 7 inches to "one side or the other. It is erected in the same building and the old meridional "aperture is used, but widened from 12 to 24 inches. The only doubt is whether this "widening is all to one side or on both equally, on which point there is no documentary "evidence forthcoming; but it is reasonable to suppose, and moreover the walls shew some "evidence, that the latter was the course adopted. In any case the error can only amount "to about 6 inches." This evidence, for want of better, has been accepted as decisive.

In order to re-establish the connection between the Meridian Circle and the modern triangulation, the station named Madras Dome Observatory Station, or XXXVII, was first established on the roof of the Government Astronomer's dwelling house, which is within the same enclosure as the observatory containing the Meridian Circle, and was connected with the Principal Triangulation of the Madras Longitudinal Series.

On the 2nd June 1865, with the assistance of Mr. Pogson, Government Astronomer, who set the Meridian Circle to the nadir point by intersecting the reflection of the wires in mercury, Major Branfill established a point plumb over the centre of the eye-piece of the instrument duly collimated, and transferred it to the shutter of the meridian aperture in the roof when shut, the shutter being rigid and not likely to warp or alter its position at rest. The operation when complete was repeated and the position of the mark cut into the surface of the shutter was found satisfactorily correct.

From this point a base-line was measured in the observatory compound in a direction S. by E. closing on a very large register peg. Two 2-foot Gunter's scales were first laid in the line (at 86° F.) and then the rest was measured with three 10-foot teak-wood bars, using plummet and hair line to lay the bars exactly. Eight sets of bars were laid making a distance of $8 \times 3 \times 10 + 4$ feet from the centre of the Meridian Circle.

The teak-wood bars were compared with a standard 10-foot bar and their mean length found to be 10·0018 feet. Hence the length of the base was

$244 + {\cdot}0018 \times 24 + {\cdot}0011$ (the correction to brass scales at 86° to reduce to 62° Fah.) $= 244{\cdot}0443$ feet.

Angular observations were then taken at the three stations, Madras Dome Observatory with Troughton and Simms' 24-inch Theodolite No. 1, the Register Peg with a 14-inch theodolite, and the Meridian Circle Nadir Point with a 7-inch. The observations with the 7-inch were afterwards rejected and a supplemental angle used.

The angular measurements and their particulars are as follows:—

At the Dome Observatory Station (XXXVII), the angle between the Meridian Circle Nadir Point and the Register Peg Station, was 47° 12′ 22″·0, being the mean of two measures, one on face left and one on face right. At the Register Peg Station the angle between the Dome Observatory Station (XXXVII) and the Meridian Circle Nadir Point, was 55° 50′ 16″·7, being the mean of six measures, three on face left and three on face right. These angles together with the measured base furnished the data for the following calculation:—

Station.	Observed Angles.	Angles for Computation.	Distance.		
			Log. feet.	Feet.	Miles.
	° ′ ″	° ′ ″			
Meridian Circle Nadir Point		76 57 21·3	2·5105286	323·99	·061
Register Peg S.	55 50 16·7	55 50 16·7	2·4396252	275·19	·052
Madras Dome Obsy. (XXXVII)	47 12 22·0	47 12 22·0	2·3874610	244·04	·046

The two following angles were also measured at the Dome Observatory Station, (1) between Malaipedu (XXXVI) and the Meridian Circle Nadir Point, 168° 45′ 26″·9; and (2) between Chĕmbedu (XXXV) and the Meridian Circle Nadir Point, 121° 47′ 45″·5, each of these two angles being the mean of two measures, one on face left and one on face right, made with Troughton and Simms' 24-inch Theodolite No. 1. By the application of these two angles to the azimuths of Malaipedu and of Chĕmbedu respectively at the Dome Observatory Station, the values 247° 29′ 49″·3 and 247° 29′ 48″·6, of the azimuth of the Meridian Circle Nadir Point were obtained, the mean of which 247° 29′ 49″·0, was employed in calculating the latitude and longitude of the Meridian Circle Nadir Point as given below:—

Madras Meridian Circle.

Latitude North ... ... 13° 4′ 3″·11.

Longitude East of Greenwich ... ... 80 17 21 ·51.

June, 1887. W. H. C.

LAMBTON'S ORIGIN OF LONGITUDE.

NOTE.—In course of a recent examination of the records of Lambton's triangulation it has been discovered that the point hitherto assumed as the origin of Lambton's Longitude, *viz.*, the centre of the present Meridian Circle of the Madras Observatory, cannot be correct. It appears from the triangulation connecting it with the southern station of his Base-line at Madras, which still exists, that the origin of Longitude must have been 13 feet west and 6 feet south of the centre of the Meridian Circle.

October, 1890. W. H. C.

MADRAS LONGITUDINAL SERIES.

PRINCIPAL TRIANGULATION. ALPHABETICAL LIST OF STATIONS.

Adhibĕtta	XVII.
Adhúrbĕtta	XII.
Ammĕdikal	V.
Anandalamalai	XXXI.
Ánúr	VI.
Avirimodu	XXXIX.
Ballamale	IV.
Bandapalle	XVIII.
Batinkŏnda	XXVII.
Bhúpatamma (Of the Great Arc Meridional Series, Section 8° to 18°).	XLIX.
Chaudanhalli	XVI.
Chĕmbedu	XXXV.
Desáni	XI.
Devarakŏnda	XXIII.
Háltibĕtta	XV.
Hemagiri (Of the Great Arc Meridional Series, Section 8° to 18°).	XLIV.
Injambákam	XLV.
Kailásgarh	XXIX.
Káraveri	XXI.
Kittávar	VIII.
Kolar (Of the Great Arc Meridional Series, Section 8° to 18°).	XLVIII.
Krishnamakŏnda	XXII.
Kudurĕmukha	III.
Kurudamale	XIX.
Kurumkota	XXXII.
Madras Dome Observatory	XXXVII.
Malaipedu	XXXVI.
Manamai Kunnatúr	XL.
Mángád	XLIII.
Mangalore	II.
Mávandúr	XXXIV.
Mijár	I.
Muchil	VII.
Mugali	XXV.
Muruktŏre	XXVIII.
Nagari	XXXIII.
Nanmangalam	XLII.
Náráyandurga	XIV.
Nughallibĕtta	XIII.
Patikŏnda	XXIV.
Pudupák	XLI.
Pullúr	XXX.
Pushpagiri	IX.
Rangaswámibĕtta (Of the Great Arc Meridional Series, Section 8° to 18°).	XLIII.
Sátanhalli	X.
Satghur	XXVI.
St. Thomas's Mount	XLIV.
Tirumani	XXXVIII.
Yĕrrakŏnda	XX.

MADRAS LONGITUDINAL SERIES.

PRINCIPAL TRIANGULATION. NUMERICAL LIST OF STATIONS.

I	Mijár.
II	Mangalore.
III	Kudurĕmukha.
IV	Ballamale.
V	Ammĕdikal.
VI	Ánúr.
VII	Muchil.
VIII	Kittávar.
IX	Pushpagiri.
X	Sátanhalli.
XI	Desáni.
XII	Adhúrbĕtta.
XIII	Nughallibĕtta.
XIV	Náráyandurga.
XV	Háltibĕtta.
XVI	Chaudanhalli.
XVII	Adhibĕtta.
XLIII (Of the Great Arc Meridional Series, Section 8° to 18°.)	Rangaswámibĕtta.
XLIV (Of the Great Arc Meridional Series, Section 8° to 18°.)	Hemagiri.
XLVIII (Of the Great Arc Meridional Series, Section 8° to 18°.)	Kolar.
XLIX (Of the Great Arc Meridional Series, Section 8° to 18°.)	Bhúpatamma.
XVIII	Bandapalle.
XIX	Kurudamale.
XX	Yĕrrakŏnda.
XXI	Káraveri.
XXII	Krishnamakŏnda.
XXIII	Devarakŏnda.
XXIV	Patikŏnda.
XXV	Mugali.
XXVI	Satghur.
XXVII	Batinkŏnda.
XXVIII	Muruktŏre.
XXIX	Kailásgarh.
XXX	Pullúr.
XXXI	Anandalamalai.
XXXII	Kurumkota.
XXXIII	Nagari.
XXXIV	Mávandúr.
XXXV	Chĕmbedu.
XXXVI	Malaipedu.
XXXVII	Madras Dome Observatory.
XXXVIII	Tirumani.
XXXIX	Avirimodu.
XL	Manamai Kunnatúr.
XLI	Pudupák.
XLII	Nanmangalam.
XLIII	Mángád.
XLIV	St. Thomas's Mount.
XLV	Injambákam.

MADRAS LONGITUDINAL SERIES.

DESCRIPTION OF PRINCIPAL STATIONS.

The Principal Stations comprised in the eastern and western sections of this Series as well as the four stations of the Great Arc Meridional Series which are common also to this Series, with certain exceptions noted below, are situated on hills or rising ground. Each consists of a solid, circular, isolated pillar of masonry 3½ feet in diameter and varying from 1 to 10 feet in height. In the centre and upper surface of the pillar a mark (circle and dot) engraved on stone is embedded in the normal of one or more similar marks inserted within the pillar, the lowermost in several instances being cut on the rock *in sitû*. Around the pillar, and level with its surface, a solid platform of stones or of earth and stones, 16 feet square, has been built for the accommodation of the observatory tent. The exceptions are the stations numbered II (Mangalore), XXXV (Chĕmbedu) and XXXVII (Madras Dome Observatory). The first of these has a perforated pillar which was surrounded by a temporary scaffolding for the accommodation of the observatory tent; the second consists of a lofty perforated pillar of masonry, surrounded by a tower of sun-dried bricks for the observatory tent to rest on, both the central pillar and tower having an aperture at the base for access to the ground level mark; the third is situated on the roof of the Government Astronomer's dwelling house in the Madras Observatory compound and is described in detail hereafter.

All the stations except XXXV and XXXVII have their upper marks protected by small pillars of masonry in the form of a frustum of a pyramid, 28 inches square at base, 20 inches at top and 3½ feet in height. These protecting pillars carry sufficiently accurate marks on their upper surfaces for Topographical and Revenue Survey purposes as shewn at page 74 of Volume II of the *Account of the Operations &c.* At station XLIV (St. Thomas's Mount) the theodolite was set up on a well-braced wooden trestle, 24 feet in height, the observatory tent being accommodated on a timber scaffolding erected around the trestle. This station has therefore been called a trestle station in keeping with the procedure followed in the description of the stations of the South-East Coast Series of the Southern Trigon.

The following descriptions have been compiled from those given by the Officers who executed the Series, supplemented in a few instances, as regards adjacent villages, from the Madras Revenue Survey Maps (scale 1 inch = 1 mile) of the country traversed, and corrected, so far as the local sub-divisions in which the several stations are situated, from the Annual Returns furnished by the district Officers to whose charge the stations are committed.

The orthography is in accordance with the official lists published under the orders of the Government of India with this difference that the long *é* is shewn without an accent, in conformity with the rules for spelling names in Northern India, and the short *e* as *ĕ*, and *o* is treated in the same manner. Final vowels and those in well-known terminals are unaccented. When the popular spelling of a name has been accepted by Government, its correct transliteration is given in parenthesis where the name occurs for the first time.

I. Mijár Hill Station, lat. 13° 3′, long. 74° 59′—observed at in 1872—is situated on one of a group of low hills, rising to a height of about 500 feet above the surrounding country and locally known by the name of Nishániguda. The road to Mulki leaving the main road from Mangalore (Mangalúr) to Mudabidari, about 4 miles short of the latter place, passes close to the foot of the hill. The ascent is from the village of Pútagi, the station being easily reached in 30 minutes from the point where the path leaves the road. The station is about 4 miles W.N.W. of Mijár and 4½ miles W. by S. of Mudabidari. It is probably built on the site of "Meejar H.S." of Colonel Lambton's triangulation. The station is in the lands of the village of Mijár, taluk Mangalore, district South Canara (Kannada).

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3⅓ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·40 feet below it. The azimuths and estimated distances of the circumjacent places are:—Tarapári (cross of the Roman Catholic Chapel) 104° 46′, miles 3½; Pútagi 200°, mile 1; Járanthaya (temple) 17° 5′, miles 2; and Mudabidari (temple) 254° 3′, miles 4.

II. Mangalore or Kodeyál Bandar Station, lat. 12° 52′, long. 74° 53′—observed at in 1872 and 1873—is situated on the high ground or hill of laterite overlooking the sea and a portion of the town, 45 feet N.E. by E. of the Light-house centre and 200 feet W. of the Idgah supposed to be the building fixed by Colonel Lambton's triangulation. The ground here is about the highest in the place, being 175 feet above the sea, and is nearly a mile inland from the river or backwater. The station is in the lands of Kodeyálbail village, taluk Mangalore, district South Canara.

The station consists of a hollow pillar 6 feet square at base and 11·3 feet high, built of laterite stone set in mortar, which contains three mark-stones, the lowest about the ground level engraved on a piece of granite set in the foundation, the second in the chamber of the pillar 0·56 of a foot above the first, and the third on the surface of the pillar 11·29 feet above the first. When visited in 1873 for making Circumpolar Star Observations for azimuth, the station was found in good preservation and no alteration appears to have been made from the absence of any remarks in the original records. The pillar for the Zenith Sector employed in the Latitude Observations in 1872 is 6 yards east, and the site occupied by the Transit Telescope for the Electro-Longitude Observations in 1873 is 63 feet south of the station mark. The azimuths and distances of the circumjacent places are:—Kadri (pagoda in the suburbs of the town) 216° 42′, miles 1½; Kadri (cross of the Roman Catholic Chapel) 123° 39′, yards 300; Basil Mission Church (centre of the belfry) 297° 56′, yards 500; Idgah (N. minaret) 270° 6′, yards 66; Idgah (S. minaret) 281° 52′, yards 66; and Light-house (N.E. corner of Light-house buildings) 55° 39′, feet 22. *Note*:—The last three distances were obtained by actual measurements.

III. Kudurĕmukha Hill Station, lat. 13° 8′, long. 75° 18′—observed at in 1872 and 1873—is situated on the highest point of the lofty group of peaks, which stands out prominently from the Western Ghâts; the peak on which the principal station is fixed is called "Funk Point" by the district officers and the residents of Mangalore, the former of whom have built a bungalow about a mile E.N.E., some 20 minutes' walk from the station. Another peak ¾ of a mile to the E. by S. of the present station, called "Mukh Head" was originally adopted as a station and built upon but was abandoned as being unsuitable for connecting the Mangalore Meridional and the Madras Longitudinal Series. The peak called Pándukal by the Natives and "Midge Point" by the Europeans, is a mile W. by N. and has been fixed as a secondary station and marked by a circle and dot engraved on the rock. These three peaks are on the ridge or watershed of the mountain which is the boundary between South Canara and Mysore (Maisúr). The station is most easily reached from the town of Bellat Angádi by a cart road 7½ miles to Nágúr at the E.S.E. foot of the mountain, whence the ascent, about 5,600 feet, is made by a well traced bridle path of 12½ miles to the bungalow above mentioned. The station is in the lands of the village of Samse, taluk Vastára, district South Canara.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3⅓ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·21 feet below it. When again visited in 1873, it is presumed from the absence of any remarks in the original records that the station was found in good order and no alteration in its construction was made. The directions and distances of the circumjacent villages are:—Allat Angádi S.S.W., miles 6½; Bangavádi E.S.E., miles 7¼; Jamalabad S. by E., miles 7½; and Bangár E. by N., miles 2¾.

IV. Ballamale Hill Station, lat. 12° 49′, long. 75° 8′—observed at in 1872—is situated on one (though not the highest) of a group of hills, 6½ miles S.S.E. of the large villages of Bantvál and Páni Mangalúr on the high road from Mangalore to Mercara (Mĕrkára) and on the right bank of the Nĕtrávati river. It is approached from the village of Vírakumba on the road from Páni Mangalúr to Kásaragod (known as the Cannanore (Kannúr) road) at a distance of about 5 miles from the former place and 3 miles from where this road leaves the main road from Mangalore to Mercara. The ascent, some 640 feet, from the village of Vírakumba is a short but steep climb of about 20 minutes. There are numerous hamlets scattered round the base of the hill, at short distances, belonging to the villages of Vírakumba, Kálinja and Arĕbĕtta. The station is probably close to the site once occupied by "Bullamully H. S." of Colonel Lambton's triangulation, and is in the lands of the village of Vírakumba, taluk Kásaragod, district South Canara.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·98 feet below it. The azimuths and estimated distances of the circumjacent places are:—Kálinja 25°, miles 1¼; Arĕbĕtta 168°, miles 1¼; Ananthári 253°, miles 1¾; and Bantvál (travellers' bungalow) 151° 49′, miles 6¾.

V. Ammĕdikal Hill Station, lat. 12° 59′, long. 75° 33′—observed at in 1872—is situated on the highest boulder of the hill so called which forms a prominent and conspicuous feature of this portion of the Western Gháts, rising as it does from the low country and commanding a wide and extensive view of the sea on the west to far over the Mysore plateau on the east. The ascent to the station from the village of Miár is a stiff climb of about 5 hours, the last 1,500 feet being not only very difficult but in places very dangerous. The station is in the lands of the village of Miár, taluk Uppinangadi, district South Canara.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitû* and the other 1·17 feet above it on a stone imbedded in the upper surface of the pillar. The azimuths and estimated distances of the circumjacent villages are:—Puláji 124°, miles 3; Neria 111°, miles 3½; Púdubet 81°, miles 4½; Mulla 59°, miles 2½; Shishala 6°, miles 3¾; Nálmalai 156°, miles 2½; and Miár 75°, miles 3½.

VI. Ánúr or Rangaswámigiri Hill Station, lat. 13° 19′, long. 75° 42′—observed at in 1872 and 1873—is situated on the southernmost peak of the Madlakal group of hills, 2 or 3 miles W.N.W. of Ánúr on the road from Múdagĕre to Yĕdĕhalli, 8 miles W. of the town of Chikmagalúr, and 4¾ miles N.W. of Vastára. A cart road from Chikmagalúr and Vastára runs to Ánúr, whence the ascent to the station of about 3,000 feet is made by a foot and bridle path through the Basgodu coffee estate. The station is in the lands of the village of Hanjiravalli, taluk Chikmagalúr, district Kadúr.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitû* and the other 2·23 feet above it on a stone imbedded in the upper surface of the pillar. When re-visited in 1873, the station was found in a good state of preservation and no alteration in its construction appears to have been made. The azimuths and estimated distances of the circumjacent places are:—Chikmagalúr (travellers' bungalow) 269° 22′, miles 8½; Ánúr (temple 120 yards E. of the road) 285° 27′, miles 2½; Baigúr (centre of the temple) 103° 44′, miles 1½; Mávinguri 23°, mile ¾; and Koligunhalli 303°, mile ¾.

VII. Muchil Hill Station, lat. 12° 37′, long. 75° 22′—observed at in 1872—is situated on the eastern and higher point of the hill locally called Muchilpannai or Muchilgudda, about a mile to the N. of the village of Kanakmajil on the high road from Mangalore to Mercara. The hill is situated at the trijunction of the village lands of Kanakmajil, Súlia and Kúrumarika. The ascent of about 900 feet is made from a point on the high road near Kanakmajil (the nearest village to the station) by a circuitous though moderately easy path leading through jungle. The station is in the lands of the village of Kanakmajil, taluk Kásaragod, district South Canara.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·30 feet below it. The directions and distances of the circumjacent villages are:—Súlia S.E., miles 6; Balari N.E., miles 4½; Uddúr S.W., miles 6¾; and Isvara Mangalam W., miles 4¾.

VIII. Kittávar Hill Station, lat. 13° 4′, long. 75° 50′—observed at in 1872—is on the eastern half of the roof of a small temple dedicated to Vírabhadra Devar, on the summit of the hill locally known as Kittávaradagatta or Sálavaradagatta, rising to a height of about 270 feet. The station is 1⅓ miles N. by W. of the Hobli village Arĕhalli, 8 miles S.W. by S. of the town of Belúr, and 4⅓ miles W. of the road from Sakalespur to Belúr. It is in the lands of the village of Anugatta, taluk Belúr, district Hassan.

The station consists of a solid, circular pillar of masonry 3½ feet in diameter, built on the roof of the front or eastern room of the temple, and contains two mark-stones, one fixed on the roof and the other 2·71 feet above it, flush with the upper surface of the pillar: a mark is also engraved on the stone floor of the eastern room 11·04 feet below and in the normal of the upper mark in the surface of the pillar. The approximate azimuths and distances of the adjacent places are:—Sirgúr 110°, miles 3; Dŏd Shialvara 123°, mile 1; Kittávar 265°, mile ½; Kaukuppe 211°, miles 1½; and Basvana shrine 170°, yards 54.

IX. Pushpagiri or Phúpgiri Hill Station, lat. 12° 40′, long. 75° 44′—observed at in 1872—is situated on the top of the conspicuous mountain on the northernmost frontier of Coorg (Kurg), overlooking the Bisale Ghát, and about 5½ miles E. of Subrahmani, after which large village it is also known. The station is 15 yards S. of the southern corner of the rude temple enclosure surrounding the rough, loose stone shrine dedicated to Sánt-Malesvara, and 40 yards S.W. by S. of the beacon pile on which once a year (on a Saturday in

January) a light is burnt. This is probably the point "Soobramanee" of Colonel Lambton's triangulation. The station is approached from Vangúr temple on the road from Kŏdlipet and Sakalespur to the Bisale pass in about 4 hours' walk, or in a 5 hours' walk from Somavarpet in Coorg to Bidhalli and Hiridigadde at the N.E. by E. foot of the mountain, whence the ascent can be made in 3 hours without much difficulty by an old and improved elephant track through a dense and extensive forest along the N.E. foot of the mountain. The station is in the lands of the village of Kumbarhalli, taluk Nanjarajpatna, district Coorg.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·83 feet below it. The azimuths and estimated distances of the circumjacent villages are:—Kumbarhalli 261°, miles 5; Bidhalli 259°, miles 3; and Hegaramani 259°, miles 1½.

X. Sátanhalli Hill Station, lat. 12° 51′, long. 76° 15′—observed at in 1871—is situated on the highest of the group of hills about 4½ miles N.W. of Narsipur, 2 miles N. of the Hemávati river, a little below the Srirâma Devarabĕtta anicut (recently restored), and 1¾ miles N.W. by W. of the village of Bĕtta Sátanhalli. The hill rises about 700 to 800 feet above the surrounding country and is ascended from the village of Bĕtta Sátanhalli. The station is in the lands of the village of Sátanhalli, taluk Hŏle Narsipur, district Hassan.

The station consists of a platform of stones and earth about 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 2·13 feet below it. The azimuths and estimated distances of the circumjacent places are:—Mávinkĕre (temple near the bank of the Hemávati river) 77° 27′, miles 2½; Narsipur (Channel Superintendent's bungalow) 338° 12′, miles 4½; Halĕkota (temple) 92° 42′, miles 2½; Shigaranhalli 221°, miles 1½; Hangarhalli 98°, miles 3; and Srirâma Devarabĕtta anicut (pillar on the E. bank of the channel, N. side) 81° 1′, miles 2½.

XI. Desáni or Dŏddachinginabĕtta Hill Station, lat. 13° 17′, long. 76° 12′—observed at in 1871—is situated on the highest boulder of the northernmost peak of the Desáni group of hills, 12½ feet S. of the precipice, about a mile N.W. by N. and 800 feet above the village of Desáni, 2 miles N.E. of Undiganhál, and 7½ miles W.S.W. of Arsikĕre at the junction of four roads. The higher (but not the highest) point of the group—the site of Colonel Lambton's station of "Daesauneegooda"—was occupied at first but was abandoned in consequence of Sátanhalli station being invisible from it. It is in the lands of the village of Desáni, taluk Arsikĕre, district Hassan.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 2·13 feet above it on a stone imbedded in the upper surface of the pillar. The azimuths and distances of the adjacent places are:—Harnhalli (S.E. corner of the high bastion of the fort) 294° 3′, miles 5½; Matád Hŏshalli 196°, miles 1½; Shinganhalli 171°, miles 1¾; Kurbarhalli 140°, miles 1¼; Handrahalli 94°, miles 1⅜; and Javagal (on the high road from Belúr to Banávara) 104°, miles 6½.

XII. Adhúrbĕtta Hill Station, lat. 12° 29′, long. 76° 19′—observed at in 1871—is situated on a stony ridge or hill about 200 feet high, 2 miles S. of the Hŏsúr ferry on the Cauvery (Káveri) river, ½ mile N. of the road from Yĕdatŏre to Bĕttadpur and 8 miles W. of the former. The station is in the lands of the village of Halliúr Bedarhalli, taluk Yĕdatŏre, district Mysore.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 2·58 feet below it. The azimuths and distances of the circumjacent places are:—Kŏppa (old Kasba) 62°, mile 1; Dŏddakopal 98°, miles 1·12; Halliúr 121°, mile 0·9; Sálákopal 134°, miles 6·1; Hŏsúr 156°, miles 1¼; Melúr (tall white temple) 195° 49′, miles 7; and the anicut over the Cauvery river (the origin of the Mirlain channel) 207° 46′, miles 1·75.

XIII. Nughallibĕtta Hill Station, lat. 13° 2′, long. 76° 31′—observed at in 1868 and 1871—is situated on a small hill of bare rock, rising about 130 to 140 feet above its base and crowned by a temple dedicated to Jogi Náth, and about ½ a mile W. of a road from Nughalli village going northward. The station mark is 38 feet S. of the south Vimana of the temple. It is in the lands of the village of Nughalli, taluk Channaraypatna, district Hassan.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·0 foot above it on a stone imbedded flush with the surface of the pillar. When again visited in 1871, the station was found in a state of perfect preservation and no alteration in its construction appears to have been made from the absence of any remarks in the original records. The azimuths and perambulated distances of the adjacent places are:—Nughalli (principal spire of a temple on the W. side of the fort) 359° 2′, miles 1·09; Jambúr (temple) 20° 6′, miles 2·7; and Dásapur 283° 51′, miles 1·20.

XIV. Náráyandurga Hill Station, lat. 12° 43′, long. 76° 38′—observed at in 1868 and 1871—is situated on the well-known hill of this name, which rises about 700 feet above the general level of the ground and is the highest in the neighbourhood; its summit is fortified and occupied by a temple and several old buildings. The station is 42 feet E. of the temple and 12 feet W. of the large stone shaft in front of the same temple. The ascent to the station, much of which is over steep, bare rock, is not very easy and can only be made from the south-western side, from the small village of Rayasamudra nearly ¾ of a mile and at the foot of the hill. It is in the lands of the village of Sindhugatta, taluk Attikuppa, district Hassan.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·0 foot above it on a stone imbedded in the upper surface of the pillar. When re-visited in 1871, the station was found in good order and no change in its construction appears to have been made. The azimuths and distances of the circumjacent places are:—Attikuppa (ridge of the roof of the travellers' bungalow) 59° 20′, miles 7·61; Attikuppa (P.W.D. bungalow) 60° 47′, miles 7·6; Attikuppa (spire of the temple) 64° 25′, miles 7; Sindhugatta (fort in the village) 64° 19′, miles 2·80; and Kikkeri (fort) 107° 47′, miles 11·5.

XV. Háltibĕtta Hill Station, lat. 12° 53′, long. 76° 49′—observed at in 1868—is situated on a hill about 500 feet above the general level of the country; a somewhat higher point is about 55 yards to the N. and is occupied by a small temple called Malesvara. The easiest ascent is from the west, on which side the high road from Mysore to Túmkúr runs within about ¾ of a mile of the foot of the hill. There are two small villages, Boranhalli and Chitnahalli, close to the foot of the hill on the western side, but the station takes its name from the village of Hálti to the east. It is in the lands of the village of Kanchinahalli, taluk Nágamangala, district Hassan.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 2·5 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Nágamangala S. by W., miles 4½; Chitnahalli N.W. by N., miles 1¾; Krishnapura N.N.E., miles 2; Mailarpatna E. by N., miles 2¾; and Belúr (on the high road) N.N.W., miles 7½.

XVI. Chaudanhalli Station, lat. 13° 12′, long. 76° 43′—observed at in 1868—is situated on an open piece of rising ground about 2 miles N. by E. of the large village of Turuvekĕre at the junction of three roads, and ¾ mile E. of the road from Chiknáyakanhalli to Turuvekĕre. It is in the lands of the village of Chaudanhalli, taluk Tiptúr, district Túmkúr.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one on a large stone imbedded in a mass of masonry 2 feet deep and 6½ feet square level with the general surface of the ground and the other 1 foot above it in the upper surface of the circular pillar. The directions and distances of the adjacent villages are:—Bevinhalli E.S.E., mile 1; Kalanjehalli E. by N., mile ¾; Chaudanhalli (on the high road) W. by S., mile ¾; Muniyúr S.S.E., miles 1¾; and Dŏddinhalli N.E., mile 1.

XVII. Adhibĕtta Hill Station, lat. 12° 38′, long. 76° 49′—observed at in 1868—is situated on one of a short range of sharp-peaked hills, running nearly north and south and rising from 300 to 500 feet above the general level of the country. The one occupied by the station is the highest but one of the group and lies about 1⅓ miles north-west of the high road from Sĕringapatam (Srirangapatna) to Kunigal, and 9½ miles N.E. by N. of Chattar on the high road from Sĕringapatam to Nágamangala. The station is on the southernmost peak of the hill, on the boundary line of the villages of Hatnabĕttahalli and Bĕthalli, the highest summit is to the north, distant 1½ miles. The station is in taluk Mandya, district Mysore.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 2·0 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Muduguudúr E.N.E., miles 2¼; Dúd S.S.E., miles 2; Bilianhalli S.W., miles 3¼; Arkangiri W.N.W., miles 4½; and Mattegiri N., miles 4.

XLIII. (*Of the Great Arc Meridional Series, Section 8° to 18°*). Rangaswámibĕtta Hill Station, lat. 13° 1′, long. 77° 1′—observed at in 1867 and 1868—is situated on the summit of the highest of a group of four or five small semi-detached rounded hills, about 4 miles nearly due west of the large village of Kunigal on the high road from Sĕringapatam to Dŏdballapur. The station has been named from a well known temple which stands on another hill of the same group about ¾ of a mile to the north. It is in the lands of the village of Gunágarh, taluk Kunigal, district Bangalore (Bĕngalúr).

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·90 feet below it. When re-visited in 1868, it is presumed from the absence of any remarks in the original records that the station was found in good order and that no alteration in its construction was made. The directions and distances of the circumjacent villages are:—Nágsundra W. by N., miles 3¾; Chotanhalli S.S.E., miles 2; Dásanpur N., miles 2; and Ĕllapur W.N.W., miles 5.

XLIV. (*Of the Great Arc Meridional Series, Section 8° to 18°*). Hemagiri Hill Station, lat. 12° 49′, long. 77° 5′—observed at in 1867 and 1868—is situated on the summit of a rocky hill rising about 500 feet above the plain, about a mile S.E. of the large village of Huliyúrdurga on the high road from Sĕringapatam to Bangalore, and 5¾ and 9¾ miles respectively N.E. by N. of the large villages of Hĕbbal and Kŏppa. It is in the lands of the village of Huliyúrdurga, taluk Kunigal, district Bangalore.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 2·88 feet below it. When re-visited in 1868, it is presumed from the absence of any remarks in the original records that the station was found in good order and no alteration in its construction was made. The directions and distances of the circumjacent villages are:—Korvatti W.S.W., miles 4½; Nirsale S. by E., miles 3; Hanchipur W. by N., miles 4½; and Dalhalli E.S.E., miles 4.

XLVIII. (*Of the Great Arc Meridional Series, Section 8° to 18°*). Kolar (Kolár) Hill Station, lat. 13° 9′, long. 78° 8′—observed at in 1866 and 1867—is situated on the highest of a group of hills (but not on its highest rock which was inaccessible), about 2½ miles W. of the town of Kolar, and ¾ mile N.E. of the village of Páparáganahalli on the top of the small plateau formed by these hills. It is in the lands of the village of Páparáganahalli, taluk and district Kolar.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitû* and the other 2·8 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Vári N.E., miles 1½; Chandapilli S. by E., miles 2; and Chattarkodihalli S.S.E., miles 4.

XLIX. (*Of the Great Arc Meridional Series, Section 8° to 18°*). Bhúpatamma Hill Station, lat. 13° 0′, long. 78° 8′—observed at in 1866—is situated on the summit of the rocky hill of this name, also called Tyakal, ¼ mile N. of the Railway line and between the Railway stations of Malúr and Kolar Road, 1¼ miles S. of Belári village, and 10 miles S. by W. of the town of Kolar. It is in the lands of the village of Somásundra, taluk Malúr, district Kolar.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitû* and the other 0·7 of a foot above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Vulabĕla E.S.E., miles 4; Vanampilli E.N.E., miles 4; Sulogunte N.E. by N., miles 4; and Mangekolo S.S.E., miles 2½.

XVIII. Bandapalle or Úkuntabanda Hill Station, lat. 13° 5′, long. 78° 23′—observed at in 1866 and 1867—also known as Boregutta, is 83½ feet N. of the small unfrequented temple on a bare rocky hillock about 5 miles N. by E. of Betmangala on the high road from Vellore (Ráya-ĕllúr) to Kolar, and 5¼ miles W. by N. of Tailúr. It is in the lands of the village of Bandapalle, taluk Mulbagal, district Kolar.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·3 feet below it. When again visited in 1867, it is presumed from the absence of any remarks in the original records that the station was found in good order and no alteration in its construction was made. The directions and distances of the circumjacent villages are:—Auni N.W. by N., miles 2½; Kalikuppam W.S.W., miles 2¾; Chĕnnapur N.E. by E., miles 1¾; and Nágasundra S.W., mile 1.

XIX. Kurudamale or Kúdumale Hill Station, lat. 13° 12′, long. 78° 25′—observed at in 1867—is situated on the top (not the highest point) of one of the rocky, isolated hills, so common in the neighbourhood; the hill rises to a height of about 750 feet above the plain and takes its name from a village a few hundred yards to the north to which it belongs, and 3¼ miles N. by W. of the town of Mulbagal on the high road, and 5½ miles E. of Vutnúr. This station is probably near the site occupied by the secondary station or point of "Kootamalli" of Colonel Lambton's triangulation, but was not identified. It is in the taluk of Mulbagal, district Kolar.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitû* and the other 1·83 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Kuplamargo (on the high road) E.S.E., miles 5; Lingapur S.S.E., mile 1; Singasandra E.N.E., miles 2¾; and Arĕhalli N.W. by N., miles 1½.

XX. Yĕrrakŏnda Hill Station, lat. 12° 52′, long. 78° 19′—observed at in 1866—is situated 27½ feet N. by E. from the centre of a small temple on a hill about 2½ miles N.E. of the Railway line, and 9½ miles S.E. of the Kolar Road Railway station. The station is nearly on the site of "Yerra Condah" a station of Colonel Lambton's triangulation, but of which no trace was found. It is in the lands of the village of Byátarayanahalli, taluk Betmangala, district Kolar.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 2 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Byátarayanahalli N.N.E., mile ½; Madamangala N. by E., miles 2; Nadampilli W. by S., miles 4¼; and Redvarpalli E. by S., miles 3.

XXI. Káraveri or Kárĕdi Hill Station, lat. 13° 7′, long. 78° 34′—observed at in February and March 1866—also called Káraváda, is situated 48·2 feet N.N.E. from the stone shaft in front of a temple on a low hill, about 5 miles E.N.E. of Malarmpilli, and 9 miles N. by E. of Vĕnkatagirikota on the high road from Vellore to Kolar. It is in the lands of the village of Káraváda, taluk Palmaner, district North Arcot (Árkád).

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·67 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Rámapuram E.N.E., mile 1; Gedúr E.S.E., miles 1½; Shemagapalli S. by W., miles 1¼; and Tailúr S.W. by W., miles 8.

XXII. Krishnamakŏnda Hill Station, lat. 12° 57′, long. 78° 33′—observed at in 1866—is situated on a hill so called near the head of the Naikaneri pass, about 4 miles S.E. by S. of Vĕnkatagirikota on the high road from Vellore to Kolar and some 2 miles S.W. of the same road. The station is 35½ feet N. by W. from the centre of a temple, and is in the lands of the village of Bairĕddipalle, taluk Palmaner, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·65 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Pĕddavogu N.E. by E., miles 1¾; Krishnapuram S.W., miles 8; Patimáyanpalli W., miles 1½; and Bĕlakunta S.E., mile 1.

XXIII. Devarakŏnda Hill Station, lat. 13° 5′, long. 78° 43′—observed at in 1866—is situated on the summit of a hill, about a mile N. of the village of Nĕllipatla, 10 miles S.W. by S. of the sanitarium of Palmaner on the high road from Chittoor (Chittúr) to Bangalore. It is in the lands of the village of Nĕllipatla, taluk Palmaner, district North Arcot.

The station consists of a platform of stones and earth, enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains three marks, one engraved on the rock *in sitú* and two others on stones built within the pillar at 2·10 and 4·20 feet respectively above it, the uppermost being in the surface of the pillar. The directions and distances of the circumjacent villages are:—Yĕrlabanda E., mile 1; Kurrupalle N. by E., miles 1½; Nagarĕddipalle W., miles 4; Mallágatapalle S.E. by S., miles 2¾; and Zolarpalle N.W. by W., miles 4.

XXIV. Patikŏnda Hill Station, lat. 13° 10′, long. 78° 41′—observed at in 1866—is situated on the highest point of a hill about a mile S.S.E. of the village of this name, 7 miles W.S.W. of the sanitarium of Palmaner. The station is on the site of Colonel Lambton's Survey station of "Putticondah", and is in the lands of the village of Patikŏnda, taluk Palmaner, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·63 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Vugani W., miles 2¾; Átakarlapalle E. by N., miles 1½; Gundlapalle E.S.E., miles 1½; Ballipalle S. by W., miles 1½; and Chiliganpalle S.W. by W., miles 2.

XXV. Mugali Hill Station, lat. 13° 10′, long. 78° 52′—observed at in 1866—is situated on the bare summit of the well-known hill of this name about 5¼ miles W.S.W. of Vĕnkatagiri, a mile S. of the Mugali pass, and 5¾ miles E.S.E. of the town of Palmaner. It is in the lands of the village of Mugalarapalle, taluk Chittoor, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains two mark-stones, one in the upper surface of the pillar and the other 1·98 feet below it. The directions and distances of the circumjacent villages are:—Takamanda E.S.E., miles 1½; Kŏndarapilli N.E. by E., miles 2½; Mugali N. by E., miles 1½; Masalmaru W. by S., miles 4; and Kalupalle S.W. by W., miles 5¼.

XXVI. Satghur (Sátghadi) Hill Station, lat. 12° 57′, long. 78° 47′—observed at in 1866—is situated on the centre of a turret, the highest point of the old fortress, 2¼ miles N.E. of Kamavaripalle, 1¼ miles E. by N. of Satghur at the foot of the hill, and 1⅓ miles N.E. by N. of the milestone No. 38 on the high road from Gudiyátam to Kamavaripalle. It is in the lands of the village of Pĕranambat, taluk Gudiyátam, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry, which contains two mark-stones, one in the soil of the old turret and the other 2 feet above it in the upper surface of the pillar. The directions and distances of the circumjacent villages are:—Chintakanama E.S.E., miles 1¾; Chĕrlapalle S.E., miles 1½; Lálápet S.W., miles 1½; and Gundlapalle N., miles 2½.

XXVII. Batinkŏnda Hill Station, lat. 13° 1′, long. 79° 9′—observed at in 1866—is situated on one of a group of hills on the high road from Vellore to Chittoor, about 2 miles S.E. of Chittapárai, 1½ miles W.N.W. of the 3rd milestone from Vellore Railway Station, 3½ miles N.E. of Árambákam, and 2¾ miles N.N.E. of Karisamangalam. It is in the lands of the village of Vandratángal, taluk Gudiyátam, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 2·48 feet above it on a stone imbedded in the upper surface of the pillar. The directions and distances of the adjacent villages are:—Kirustanpet S.E. by E., miles 1¼; Sorakapálaiyam S.S.E., miles 2; Motúru S.W., miles 2¾; and Tŏndamtulasi W.S.W., miles 2.

XXVIII. Muruktŏre Hill Station, also known as Jhandabodu, lat. 13° 16′, long. 79° 8′—observed at in 1866—is situated on a hill about a mile or so west of the high road from Chittoor to Cuddapah (Kadapa), and 3 miles N.N.W. of the town of Chittoor. It is in the lands of the village of Voiltota, taluk Chittoor, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains two marks, one on a rock or large boulder *in sitú* and the other 2 feet above it on a stone imbedded in the upper surface of the pillar. The station occupies the site of a pile of stones which is believed to have marked the position of "Moorookthora" a secondary station of Colonel Lambton's triangulation. The directions and distances of the circumjacent villages are:—Patnam W.N.W., miles 1¼; Voiltota N.N.E., miles 2; Paduri E.S.E., miles 2¼; Shalurapalle S.S.W., miles 2¾; and Muturapalle W., miles 1¼.

XXIX. Kailásgarh Hill Station, lat. 12° 50′, long. 79° 7′—observed at in 1866—is situated on a hill 6¾ miles S.W. by S. of the fort of Vellore, and 4½ miles W.N.W. of Kiniyambádi on the high road from Pullúr to Vellore. The station is in the lands of the village of Athúr, taluk Vellore, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·56 feet above it on a stone imbedded in the upper surface of the pillar. The centre of an old platform believed to be that of Colonel Lambton's station of "Kylasghur" is 21 feet E. of the present station. The directions and distances of the adjacent villages are:—Káttuputtúr E.N.E., miles 1½; Sattupálaiyam S.E. by E., miles 3; Solavaram S.E., miles 2¼; Usúr N.N.W., miles 2; and Sekanúr N., miles 2¼.

XXX. Pullúr Hill Station, lat. 13° 14′, long. 79° 24′—observed at in 1865 and 1866—is situated on a hill known in the neighbourhood as Jhandakona, 5¾ miles W.S.W. of Attimancheripet on the high road from Shŏlinghur (Shŏlangarh) to Kŏlagunta, and nearly a mile N.E. of Alidonabanda, a point on the same mass of hills. The station is in the lands of the village of Pullúr, zamíndári Kárvĕtnagar, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry which contains two marks, one engraved on a stone in the upper surface of the pillar and the other 1½ feet below it which was found engraved on the rock *in sitú*. This station is identical with that of "Pilloor" of Colonel Lambton's triangulation, the mark of which was found cut on the rock *in sitú* under a shapeless pile of stones. When again visited in 1866, the station was found in good order and no alteration in its construction was made. The approximate directions and distances of the circumjacent villages are:—Pullúr N.W. by W., miles 1½; Bŏmmarájapuram S.E., miles 3¼; Rámalingapuram S. by E., miles 2¼; Lingasamudram S.W. by W., miles 3¼; and Balla Vardappanayudi Khandrika W., miles 1¾.

XXXI. Anandalamalai Hill Station, lat 12° 56′, long. 79° 26′—observed at in 1865 and 1866—is situated on a small rocky ridge close to the hamlet of Gŏllapálaiyam, 1¾ miles E. by N. of the taluk town of Wálajápet, 3½ miles S.E. of the Arcot station of the Madras Railway S.W. line, and 4¾ miles W.N.W. of the town of Káveripák. It is in the lands of the village of Anandalamalai, taluk Wálajápet, district North Arcot.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3¼ feet in diameter, which contains two marks, one engraved on a stone in the upper surface of the pillar and the other 1½ feet below it which was found engraved on the rock *in sitú*. This station is identical with that of "Hanandamalli" of Colonel Lambton's triangulation, the mark of which was found engraved on the rock *in sitú* and was adopted as the lower mark of the present station. When again visited in 1866, the station was found in good order and no alteration in its construction is stated to have been made. The approximate directions and distances of the adjacent villages are:—Shrotriam Musiri E. by N., miles 1½; Tĕnkadapantángal S. by W., miles 1¼; Mantángal W. by N., miles 3¾; and Vagavali E.S.E., miles 2.

XXXII. Kurumkota Station, lat. 13° 3′, long. 79° 47′—observed at in 1865—is situated on an extensive swell of stony ground and occupies the site of an old cattle pen, the place being said to be named after a tribe of Kurumbars (herdsmen) who had a place (kot) close by of which the remains exist about a mile to E. The station is 5½ miles S.E. by E. of the Arkonam Junction station, and 3⅓ miles S. by W. of the station of Chinnammápet of the Madras–Beypore (Bepúr) Railway. The station is in the lands of the village of Nagarikuppam, taluk Wálajápet, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 4 feet high and 3¼ feet in diameter, which contains three marks, the lowest engraved on the rock *in situ* and two others on stones built within the pillar at 2 and 4 feet respectively above it. The directions and distances of the circumjacent villages are:—Nagarikuppam W.N.W., mile ¾; Uriyúr E., miles 1¾; Anantapuram S., miles 1¾; Takulam S.S.W., miles 2; Attúr W., miles 3¼; and Pudúr E.N.E., miles 1¼.

XXXIII. Nagari Hill Station, lat. 13° 23′, long. 79° 38′—observed at in 1865—is situated on the summit of a very remarkable peak which rises abruptly at the western and south-western extremity of the mass of hills and 3¼ miles S. by E. of the large village of Náráyanavaram on the high road from Tiruvallúr to Putúr. The peak is precipitous on the N.W. and S. sides and is composed of gigantic boulders which seem piled in the most insecure manner as if the least shock would hurl the whole down. The station is not now on the highest boulder though it may have been occupied as such 60 years ago. It is in the lands of the village of Náráyanavaram, taluk Kárvĕtnagar, district North Arcot.

The station consists of a platform enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on a stone in the upper surface of the pillar and the other 1·5 feet below on the rock *in situ*. The lower mark was found engraved on the rock and was probably a station of Colonel Lambton's triangulation. The approximate directions and distances of the adjacent places are:—Putúr station of the Madras Railway N.W. by N., miles 4¾; Paramesvaramangalam N.W., miles 2; Gavanesapuram (on the high road near the fifth milestone) W.N.W., miles 1½; Bojarájapálem N.N.E., miles 2; Mangáda S.S.E., miles 3½; and Rámasamudram W., miles 2½.

XXXIV. Mávandúr or Mámandúr Hill Station, lat. 12° 45′, long. 79° 42′,—observed at in 1865 and 1880—is situated on the summit and towards the N. extremity of the southern portion of the rocky rige, about 150 feet high, at the southern end of the artificial bund of the Dúsi Mámandúr or Chenna Ságaram tank, and about 7 miles S.S.W. of Conjeeveram (Kánchívaram). It is in the lands of the village of Narsamangalam, taluk and district North Arcot.

This station was built in 1865 presumably on or near the site of Colonel Lambton's station of "Doosh Maumdoor", but no station mark was found except a pile of stones round the base of an old staff fixed in a crevice of the rock and cut off flush with the surface. A mark was first made on the stump of the staff, and over this was built a solid, circular pillar of masoury 3½ feet in diameter carrying a mark engraved on stone imbedded in its upper surface 1·5 feet above the lower mark. The pillar was surrounded by the usual annular wall and platform. When the station was visited in 1880, the circular pillar and its upper mark were found apparently just as left in 1865, and no alteration in the construction of the station was made. The directions and distances of the following villages are:—Mámandúr N.E. by E., miles 1½; Dúsi N.N.E., miles 3; and Narsamangalam S.E., mile ½.

XXXV. Chĕmbedu Tower Station, lat. 13° 15′, long. 80° 1′—observed at in 1865—is situated on an extensive swell of ground, about 10 miles N.E. of the town of Tiruvallúr and the same distance N.N.W. of Tinnanúr station of the Madras Railway. The station is about 50 feet N.E. of an old cairn of stones supposed to indicate the site of a secondary point of Colonel Lambton's triangulation but in which no mark was found. The station is in the lands of the village of Chĕmbedu, taluk Tiruvallúr, district Chingleput (Chĕngalpat).

The station consists of a tower of sun-dried bricks enclosing a perforated pillar of masonry 70·3 feet high, which contains a mark-stone imbedded at the ground level. This tower was 54·9 feet high when the observations were taken from it; it was raised to its present height subsequently to fix the position of the Madras Dome Observatory station, number XXXVII of this Series. The approximate directions and distances of the adjacent villages are:—Chĕmbedu S.E., miles 1¾; Malandúr N.W., miles 1½; Maiúr S.W., miles 2½; Ĕrikuppam N.E. by E., miles 2½; and Pĕriyapálaiyam N.E., miles 5¾.

XXXVI. Malaipedu Hill Station, lat. 12° 55′, long. 80° 3′—observed at in 1865 and 1880—is situated on the N.W. end of the summit of the rocky hill of this name, also called Malaipatmalai, which rises to a height of about 370 feet above its base, 1¾ miles N.W. of the road from Madras to Wálajabad and nearly midway between Vandalúr and Srípĕrumbudúr. The remains of the platform of Colonel Lambton's station "Malapode" occupy the highest point of the hill, distant 105 yards from the present station, but no mark was found. The station is in the lands of the village of Malaipedu, taluk Conjeeveram, district Chingleput.

The station, as built in 1865, consisted of a platform of stones and earth about 16 feet square, enclosing a solid, circular and isolated pillar of masonry 10 feet high and 3½ feet in diameter. The pillar contained six marks, the lowest being engraved on the rock *in situ* and five others on stones at 2, 4, 6, 8 and 10 feet respectively above it. When again visited in 1880, it was found in good order and the upper mark apparently intact, and no alteration in the construction was made. The azimuths and distances of the circumjacent places are:—Malaipedu 155°, mile ¾; Chetpat 231°, mile 1; Sirumátúr 351°, mile 1; Manimangalam (temple W. of village) 268° 40′, miles 2; Mágánam (temple) 89° 34′, mile 1; site of "Malapode" station of Colonel Lambton's triangulation 309° 45′, yards 105.

XXXVII. Madras Dome Observatory Station, lat. 13° 4′, long. 80° 17′—observed at in 1865—is in the centre of the new (larger) Equatorial Dome Observatory on the roof of the Government Astronomer's dwelling-house within the enclosure or compound in which are also the observatories containing the Meridian and Mural Circles.

The old dome having been removed, a hollow pier or pillar of masonry 3 feet in diameter, surmounted by a slab of granite pierced in the centre and 3½ feet in diameter, was raised over the slab of stone fixed on the cross walls of the Government Astronomer's dwelling-house. The total height above the stone being 30·77 feet. A scaffolding was provided for the observatory tent. The height of the stone on the cross walls above ground level is 33½ feet. When the observations were complete the pier was removed.

Note.—For the determination of the position of the Meridian Circle—Colonel Lambton's origin of Longitude—with reference to the Principal Triangulation, see the note at the end of the Introduction to this Series.

XXXVIII. Tirumani Hill Station, lat. 12° 39′, long. 80° 1′—observed at in 1880—is situated on the highest rock of the group of rocky hills rising rather abruptly to a height of 600 feet above its base, between the high road and the South Indian Railway line, 2½ miles S. of the town of Chingleput and a mile E. of the Pálár river. The lowest mark of the station is 4 feet 11 inches N. of a Revenue Survey mark cut on the same rock. It is in the lands of the village of Tirumani, taluk and district Chingleput.

The station consists of a platform of rubble stones, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains three marks, one engraved on a stone in the upper surface of the pillar and two others 1·5 and 3·0 feet respectively below it, the lowest being engraved on the rock *in sitú.* The azimuths and distances of the circumjacent places are:—Tirumani 261°, mile ½; Ŏlalúr 58°, miles 1½; Chingleput 178°, miles 2½; Gundúr (principal spire of the temple in the village) 174° 23′, miles 2½; and Revenue Survey mark 190° 7′, feet 122.

XXXIX. Avirimodu Hill Station, lat. 12° 27′, long. 79° 57—observed at in 1880—is situated on the western and highest point of the rocky hill which rises about 340 feet above its base, 4 miles S.S.E. of Madurántakam, and 1½ miles E. of the Chúnámpet road. The station is in the lands of the village of Avirimodu, taluk Madurántakam, district Chingleput.

The station consists of a platform of stones 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains two marks, one engraved on the rock *in sitú* and the other 1·6 feet above it on a stone imbedded in the upper surface of the pillar. The azimuths and distances of the following places are:—Avirimodu 45°, mile ½; Endattúr 292°, miles 1½; Chitrávádi 164°, mile ½; Karunguli (a small temple on a hill 2 miles N. of Madurántakam) 166° 22′, miles 5·75; and Tiruvapádi (a rock temple) 85° 39′.

XL. Manamai Kunnatúr Hill Station, lat. 12° 34′, long. 80° 12′—observed at in 1880—is situated on a large rock rising 75 feet above its base and forming the E.S.E. summit of the group of rocks, about 1¼ miles from the sea coast, 3 miles N. of Sadurangapatnam, and 233 yards W. of the East Coast Canal. The station is not on the highest rock of the group but lies 340 yards S.E. by E. of it, and about 450 yards E. by N. of the rural shrine called Kanniyammankoil. It is in the lands of the village of Manamai, taluk and district Chingleput.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains three marks, one engraved on a stone in the upper surface of the pillar and two others 1·5 and 3·0 feet respectively below it, the lowest being engraved on the rock *in sitú.* The directions, azimuths and distances of the circumjacent places are:—Manamai N.W., miles 1·4; Kunnatúr 49°, mile ½; Kílpákam 206°, mile ½; Kílkalani 149°, mile 0·4; and the East Coast Canal milestone (marked 32 under the letters E.C.C.) 260° 2′, yards 275.

XLI. Pudupák Hill Station, lat. 12° 48′, long. 80° 14′—observed at in 1880—is situated on the summit of a rocky hillock which rises about 100 feet above its base, about 4 miles W.N.W. (inland) from Kovallam, and 2 miles N.W. of Suttankuppam on the high road from Tiruporúr to Madras. It is in the lands of the village of Pudupák, taluk and district Chingleput.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains three marks, one engraved on a stone in the upper surface of the pillar and two others 1·5 and 3·0 feet respectively below it, the lowest being engraved on the rock *in sitú.* The azimuths and distances of the circumjacent places are:—Pudupák 278°, mile ¾; Vĕlichai 47°, miles 1¼; Kŏlattúr 92°, miles 2; Taiyúr (spire of the temple) 354° 41′, miles 2¼; Kátámpuli 234°, miles 1¼; N.W. corner of Mandapam (Pĕrumál temple) 1° 55′, feet 119; and Sŏnalúr 147°, miles 1¾.

XLII. Nanmangalam Hill Station, lat. 12° 56′, long. 80° 13′—observed at in 1880—is situated on the N.E. summit or peak of a group of stony hills which rises about 170 feet above its base, 5½ miles S. of St. Thomas's Mount, and between the villages of Rájakílapákam and Jaladampet, the cross road from the latter place which runs west to meet the great southern road from Madras, passes close to the S. foot of this group of hills. It is in the lands of the village of Nanmangalam, taluk Saidápet, district Chingleput.

The station consists of a platform of stones and earth 16 feet square, enclosing a solid, circular and isolated pillar of masonry 3½ feet in diameter, which contains three mark-stones, one in the upper surface of the pillar and two others 1·5 and 3·0 feet respectively below it, the lowest being engraved on a large stone imbedded in the rocky surface of the hill, in the centre of the foundation. The directions or azimuths and distances of the circumjacent places are:—Nanmangalam 178°, mile ¾; Modupákam 286°, mile 1; Gavuripákam S.W. by S., mile ¾; Rájakílapákam W.S.W., miles 1¼; and Jaladampet (bungalow) 280° 38′, miles 1¼.

XLIII. Mángád Hill Station, lat. 13° 0′, long. 80° 8′—observed at in 1880—is situated on the rocky hillock which rises about 100 feet above the adjacent low ground, nearly midway between Mángád and Kunnatúr, a mile E. of the great Chambrambákam tank or lake, 2½ miles S. by W. of Púndamalai, and 6½ miles W. of St. Thomas's Mount. The station is on the highest part of the rocks which culminate at the S. end of the ridge, and occupies approximately the site of Colonel Lambton's survey station of "Mungot" of which only the remains of the platform were found. It is in the lands of the village of Mángád, taluk Saidápet, district Chingleput.

The station consists of a platform of stones enclosing a solid, circular and isolated pillar of masonry, which contains two marks, one in the upper surface of the pillar and the other 1 foot below it. This point was fixed in season 1864-65 as a secondary station and was denoted by a masonry pillar containing two marks. When again visited in 1880, the pillar and the upper mark were found destroyed, but the lower mark was forthcoming and adopted. The directions, azimuths and distances of the adjacent villages are:—Mángád 201°, miles 1½; Kŏlamanipákam (Pĕrumál Koil temple) 182° 5′, mile 1; Mángád (boundary stone at the S. foot of the hill) 13° 53′, yards 140; Kovúr E. by N., miles 1½; Kunnatúr S., miles 1½; and Sikkalayapuram N., mile ¾.

XLIV. St. Thomas's Mount Trestle Station, lat. 13° 0′, long. 80° 14′—observed at in 1880—is situated in the N.W. corner of the terrace of the Portuguese (Roman Catholic) Chapel of St. Thomas which stands on the well-known mount so called, distant 8 miles S.W. of Fort St. George (Madras), and 1·3 and 0·8 miles respectively W. by S. and N.W. of the Railway stations of Guindy (Kandi) and St. Thomas's Mount. The station is 50 yards W. of the signal flag-staff and 19 yards N.W. of the N.W. corner of the chapel, and is identical with the secondary station fixed in season 1864-65, the lower mark of which was found and adopted. Colonel Lambton's station of 1802 was at the S.W. angle of the hill near the chapel. The station is in taluk Saidápet, district Chingleput.

When visited in 1880 the platform of the station of 1864-65 was found to have been removed but the lower mark was intact, a large slab of stone 3½ feet in diameter was now laid down flush with the ground level; on the upper surface of this stone in addition to the usual circle and dot—in the normal of the mark below—indicating the point of observation, a broad arrow and the letters G.T.S. 1880 are also engraved.

XLV. Injambákam Hill Station, lat. 12° 55′, long. 80° 18′—observed at in 1880—is situated on a hillock of drift sand between the East Coast Canal and the sea shore, 0·6 of a mile E. of the former and 0·3 mile W. of the latter, and near the 7th milestone of the Adyár (Madras) terminus. The hillock is included in the Pĕriyamanal (large sand waste) used as a casuarina plantation. The station is in the lands of the village of Injambákam, taluk Saidápet, district Chingleput.

The station consists of a platform of turf and sand enclosing a solid, circular and isolated pillar of masonry 6 feet high built upon piles of timber, and contains three mark-stones, the lowest set in the foundation which is 4 feet square and a foot thick, the second is a foot above in the centre of the next block 3½ feet square and 1 foot thick, and the 3rd or upper is on the surface of the circular block 3½ feet in diameter and 4 feet above the second mark, or 5 feet above the lowest. The azimuths and distances of the circumjacent villages are:—Injambákam 165°, mile ⅛; Karaipákam 101°, mile 1; Sŏlanginallúr 54°, miles 1¾; Pallipat 42°, mile ½; boundary stone No. 55, 74° 7′, feet 410; and boundary stone No. 56, 127° 46′, feet 512.

December, 1886.

W. H. COLE,
In charge of Computing Office.

MADRAS LONGITUDINAL SERIES.

PRINCIPAL TRIANGULATION. OBSERVED ANGLES.

At I (Miját)

April 1872 ; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on III (Kudurĕmukha) 0° 1′	180° 1′	79° 14′	259° 14′	158° 24′	338° 25′	237° 38′	57° 38′	316° 50′	136° 50′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
III (Kudurĕmukha) and IV (Ballamale)	″ *l* 30·10 *l* 30·18 *l* 30·72	″ *l* 31·18 *l* 31·21 *l* 30·00	″ *h* 28·22 *h* 29·25 *h* 29·64	″ *h* 31·31 *h* 29·58 *h* 30·16	″ *l* 30·38 *l* 29·58 *l* 29·70	″ *h* 30·62 *h* 28·92 *l* 30·94	″ *l* 29·85 *l* 30·23 *l* 30·26	″ *l* 28·99 *l* 30·33 *l* 29·31	″ *l* 30·42 *l* 31·53 *l* 29·98	″ *l* 29·86 *l* 30·10 *l* 31·80	$M = 30''\cdot15$ $w = 23\cdot80$ $\frac{1}{w} = 0\cdot04$
	30·33	30·80	29·04	30·35	29·89	30·16	30·11	29·54	30·64	30·59	$C = 71^\circ\, 33'\, 30''\cdot15$
IV (Ballamale) and II (Mangalore)	*l* 7·08 *l* 6·86 *l* 7·57	*l* 6·08 *l* 6·85 *l* 5·91	*l* 5·04 *l* 5·33 *l* 5·32	*l* 6·64 *l* 7·83 *l* 7·39	*h* 5·80 *h* 5·85 *h* 7·51	*h* 6·52 *h* 7·84 *h* 7·47	*h* 6·03 *h* 6·73 *h* 7·25	*h* 6·14 *h* 6·92 *h* 5·66	*l* 5·76 *l* 6·02 *l* 6·67	*l* 5·87 *l* 5·20 *l* 5·74	$M = 6''\cdot43$ $w = 17\cdot90$ $\frac{1}{w} = 0\cdot06$
	7·17	6·28	5·23	7·29	6·39	7·28	6·67	6·24	6·15	5·60	$C = 57^\circ\, 0'\, 6''\cdot43$

At II (Mangalore)

March 1873; *observed by Major B. R. Branfill with Barrow's* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on I (Mijár) 359° 53′	179° 54′	79° 11′	259° 12′	158° 25′	338° 25′	237° 36′	57° 36′	316° 48′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
I (Mijár) and III (Kudurĕmukha)	h 5·54	h 6·54	h 8·18	h 8·96	h 5·88	h 9·68	d 6·79	d 10·43	d 11·69	d 10·73	
	h 9·98	h 11·72	h 7·64	h 6·78	h 7·86	h 10·96	d 11·07	d 11·11	h 5·11	d 8·41	$M = 8''·22$
	h 4·94	h 10·32	h 5·84	h 9·14	d 8·68	d 6·87	d 10·39	d 8·75	h 8·61	h 6·29	
			h 4·02						h 7·78	h 6·61	$w = 3·95$
									d 8·26	h 4·90	$\frac{1}{w} = 0·25$
									d 7·50	d 5·39	
									d 8·40	d 6·37	
										d 5·81	$C = 32° 7' 8''·16$
	6·82	9·53	6·42	8·29	7·47	9·17	9·42	10·10	8·19	6·81	
III (Kudurĕmukha) and IV (Ballamale)	h 24·48	h 22·54	d 23·59	d 22·81	h 23·38	h 26·06	h 24·98	h 21·34	h 20·08	h 21·04	$M = 23''·62$
	h 24·44	h 23·52	d 24·13	d 24·99	h 22·80	h 23·74	h 20·70	h 20·66	h 27·25	h 23·36	$w = 4·92$
	h 24·32	h 23·44	d 25·93	d 22·63	d 24·90	d 21·45	h 21·38	h 23·02	h 23·31	h 25·60	$\frac{1}{w} = 0·20$
			d 27·75						h 24·02	h 28·34	
										h 25·06	$C = 46° 30' 23''·66$
	24·41	23·17	25·35	23·48	23·69	23·75	22·35	21·67	23·67	24·68	

At III (Kudurĕmukha)

April 1872 *and February* 1873; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VI (Ánúr) 254° 57′	74° 57′	334° 9′	154° 9′	53° 21′	233° 21′	132° 34′	312° 34′	211° 44′	31° 44′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VI (Ánúr) and V (Ammĕdikal)	h 44·06	l 44·00	h 44·87	l 45·79	h 43·84	h 43·28	h 43·98	h 44·47	h 43·21	h 43·21	$M = 44''·24$
	l 44·58	l 43·12	h 45·93	l 44·96	h 44·48	h 44·51	h 43·87	h 43·90	h 44·36	h 44·21	$w = 18·27$
	l 44·15	l 45·63	h 46·19	l 44·28	h 44·66	h 42·98	h 43·53	h 43·69	h 43·90	h 43·14	$\frac{1}{w} = 0·05$
		l 44·82									$C = 57° 13' 44''·24$
	44·26	44·39	45·66	45·01	44·33	43·59	43·79	44·02	43·82	43·52	
V (Ammĕdikal) and IV (Ballamale)	h 58·44	l 56·92	h 55·05	h 57·45	h 54·85	h 57·86	h 58·55	h 57·25	h 58·98	h 57·04	$M = 56''·96$
	l 58·30	l 55·50	h 53·77	h 57·34	h 56·22	h 58·40	h 58·13	h 57·83	h 57·48	h 57·74	
	l 57·34	l 57·23	h 55·54	h 55·52	h 54·82	h 58·14	h 58·20	h 56·50	h 56·86	h 57·23	$w = 5·65$
		l 55·94	l 53·82			h 58·20					$\frac{1}{w} = 0·18$
			l 53·99								
			l 54·26								$C = 86° 39' 56''·95$
	58·03	56·40	54·41	56·77	55·30	58·15	58·29	57·19	57·77	57·34	

NOTE—The values below the lines are taken from observations by Lieutenant J. R. McCullagh, R.E., in April 1872, with Troughton and Simms' 24-inch Theodolite No. 1.

At III (Kudurĕmukha)—(*Continued*).

Angle between	Circle readings, telescope being set on VI (Ánúr) 254° 57′	74° 57′	334° 9′	154° 9′	53° 21′	233° 21′	132° 34′	312° 34′	211° 44′	31° 44′	M = Mean of Groups w = Relative Weight C = Concluded Angle
IV (Ballamale) and II (Mangalore)	″ h 50·72 h 51·67 h 51·74	″ h 51·59 h 51·90 h 50·34	″ d 53·39 d 52·63 d 53·72	″ d 51·55 d 50·55 d 51·24	″ h 49·67 h 49·20 h 50·99	″ h 53·66 h 50·44 h 50·99	″ h 49·31 h 50·11 h 51·09	″ h 52·63 h 52·02 h 52·11	″ h 50·44 h 50·85 h 51·15	″ h 51·97 h 52·69 h 52·34	$M = 51''·42$ $w = 8·50$ $\frac{1}{w} = 0·12$
	51·38	51·28	53·25	51·11	49·95	51·70	50·17	52·25	50·81	52·33	$C = 29° 29' 51''·42$
II (Mangalore) and I (Mijár)	h 18·70 h 17·96 h 17·81	h 17·49 h 16·80 h 18·07	h 15·97 h 15·82 h 16·59	h 17·96 h 18·51 h 17·86	d 18·89 d 19·18 d 19·53	d 17·41 d 16·13 d 17·29	h 18·56 h 19·75 h 18·68	h 18·79 h 18·65 h 17·86	h 17·71 h 18·40 h 17·34	h 17·45 h 16·41 h 16·59	$M = 17''·81$ $w = 9·80$ $\frac{1}{w} = 0·10$
	18·16	17·45	16·13	18·11	19·20	16·94	19·00	18·43	17·82	16·82	$C = 19° 19' 17''·81$

At IV (Ballamale)

February and March 1872; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on II (Mangalore) 205° 5′	25° 5′	284° 16′	104° 17′	3° 29′	183° 29′	82° 40′	262° 40′	161° 53′	341° 53′	M = Mean of Groups w = Relative Weight C = Concluded Angle
II (Mangalore) and I (Mijár)	″ l 23·76 l 23·10 l 23·72	″ h 22·87 l 23·86 l 23·78	″ d 23·61 d 23·46 d 25·07	″ d 24·96 d 25·56 d 24·49	″ h 22·46 h 21·34 h 23·01	″ h 22·47 h 23·23 h 24·53 h 24·52	″ h 21·90 l 23·77 l 22·71	″ h 22·84 l 24·14 l 23·12	″ l 23·80 l 23·43 l 24·66	″ l 24·08 l 23·46 l 24·19	$M = 23''·61$ $w = 14·97$ $\frac{1}{w} = 0·07$
	23·53	23·50	24·05	25·00	22·27	23·69	22·79	23·37	23·96	23·91	$C = 44° 22' 23''·61$
I (Mijár) and III (Kudurĕmukha)	d 21·10 d 20·97 d 22·25	d 22·71 d 22·41 d 23·90	h 22·14 h 21·25 h 21·18	h 20·48 h 20·80 h 20·88	d 24·73 d 22·94 d 23·90	d 23·32 d 24·15 d 22·37	h 22·47 l 22·07 l 23·63	h 22·31 h 22·94 l 23·26	l 22·80 l 21·94 l 22·68	l 23·04 l 23·11 h 22·17	$M = 22''·46$ $w = 9·90$ $\frac{1}{w} = 0·10$
	21·44	23·01	21·52	20·72	23·86	23·28	22·72	22·84	22·47	22·77	$C = 59° 37' 22''·46$
III (Kudurĕmukha) and V (Ammĕdikal)	l 53·07 l 52·56 l 52·79	h 50·89 h 51·06 h 52·21	l 52·95 l 53·26 l 53·10	l 52·00 l 51·47 l 51·40	h 52·70 h 50·14 h 52·48 l 53·73	h 52·74 h 51·80 h 51·53	h 53·49 h 51·75 l 52·31	h 52·85 h 51·45 h 51·40	l 51·43 l 52·84 l 51·71	l 52·76 l 51·82 h 52·35	$M = 52''·19$ $w = 24·05$ $\frac{1}{w} = 0·04$
	52·81	51·39	53·10	51·62	52·26	52·02	52·52	51·90	51·99	52·31	$C = 39° 25' 52''·19$

At IV (Ballamale)—(*Continued*).

Angle between	Circle readings, telescope being set on II (Mangalore) 205° 5′	25° 5′	284° 16′	104° 17′	3° 29′	183° 29′	82° 40′	262° 40′	161° 53′	341° 53′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
V (Ammĕdikal) and VII (Muchil)	l 7·05	h 7·14	h 7·72	l 8·55	h 8·03	h 9·68	h 8·04	h 8·36	l 8·31	l 8·35	$M =$ 8″·38
	h 6·75	h 7·09	h 8·64	h 9·25	h 8·42	h 8·18	l 8·78	h 10·09	l 8·54	l 8·61	$w =$ 20·40
	h 7·51	h 8·22	h 9·40	l 8·03	l 8·79	h 7·92	l 8·86	h 8·54	l 8·24	l 10·20	$\frac{1}{w} =$ 0·05
	7·10	7·48	8·59	8·61	8·41	8·59	8·56	9·00	8·36	9·05	$C =$ 61° 38′ 8″·38

At V (Ammĕdikal)

March 1872; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VIII (Kittávar) 0° 1′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 38′	57° 39′	316° 49′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
VIII (Kittávar) and IX (Pushpagiri)	h 38·35	h 37·81	l 39·32	l 39·40	h 39·64	h 40·63	h 38·20	h 37·14	h 38·96	h 38·99	$M =$ 38″·90
	h 37·98	h 38·70	l 40·25	l 39·50	h 38·09	h 39·78	h 38·76	h 37·50	h 39·37	h 39·44	$w =$ 16·40
	h 39·67	l 38·65	l 38·41	h 38·71	h 38·65	h 39·64	h 38·16	h 37·71	h 39·49	h 40·14	$\frac{1}{w} =$ 0·06
	38·67	38·39	39·33	39·20	38·79	40·02	38·37	37·45	39·27	39·52	$C =$ 79° 11′ 38″·90
IX (Pushpagiri) and VII (Muchil)	h 53·17	h 53·30	h 53·84	h 53·79	l 52·44	h 55·61	h 53·89	h 54·25	h 53·43	h 54·11	$M =$ 53″·91
	h 52·57	h 53·44	h 54·33	h 53·46	l 52·54	h 53·57	h 54·33	h 54·41	h 54·63	h 53·17	$w =$ 17·50
	h 52·60	h 54·59	h 53·65	h 54·58	h 54·28	h 55·16	h 54·45	h 56·17	h 54·04	h 53·39	$\frac{1}{w} =$ 0·06
	52·78	53·78	53·94	53·94	53·09	54·78	54·22	54·94	54·03	53·56	$C =$ 55° 44′ 53″·91
VII (Muchil) and IV (Ballamale)	h 32·02	h 32·99	h 32·49	h 31·55	l 32·53	h 31·67	l 34·09	h 33·23	h 31·45	h 31·02	$M =$ 32″·29
	h 31·45	h 31·81	h 32·16	h 30·90	h 31·86	h 31·30	l 32·16	h 32·53	h 33·04	l 32·02	$w =$ 22·36
	h 32·15	h 31·30	h 32·48	h 31·75	h 33·14	h 31·55	l 33·55	h 33·36	h 33·37	h 32·62	$\frac{1}{w} =$ 0·04
				h 32·90							
	31·87	32·03	32·38	31·78	32·51	31·51	33·27	33·04	32·62	31·89	$C =$ 40° 48′ 32″·29
IV (Ballamale) and III (Kudurĕmukha)	h 15·55	h 15·42	h 14·16	h 15·94	l 16·58	l 13·94	l 14·89	h 16·43	h 16·38	h 16·13	$M =$ 15″·27
	h 14·10	l 16·81	h 14·33	h 16·06	l 15·37	l 15·79	l 14·01	h 15·01	h 14·55	h 14·23	$w =$ 18·90
	l 15·51	l 16·79	h 13·98	h 14·53	h 15·60	h 15·02	l 15·58	l 14·75	l 15·99	l 14·56	$\frac{1}{w} =$ 0·05
	15·05	16·34	14·16	15·51	15·85	14·92	14·83	15·40	15·64	14·97	$C =$ 53° 54′ 15″·27

At V (Ammĕdikal)—(*Continued*).

Angle between	0° 1′	180° 2′	79° 13′	259° 13′	158° 25′	338° 25′	237° 38′	57° 39′	316° 49′	136° 49′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
	Circle readings, telescope being set on VIII (Kittávar)										
	″	″	″	″	″	″	″	″	″	″	
III (Kudurĕmukha) and VI (Ánúr)	*h* 46·89	*h* 48·17	*l* 48·90	*l* 47·28	*h* 47·15	*h* 48·79	*h* 47·09	*h* 48·31	*h* 47·68	*h* 47·64	*M* = 47″·52
	h 47·30	*l* 46·67	*l* 47·77	*l* 46·15	*h* 48·29	*h* 48·85	*h* 47·32	*h* 46·58	*h* 46·79	*h* 46·81	*w* = 26·92
	h 46·78	*h* 48·01	*l* 49·21	*l* 48·38	*h* 48·22	*h* 46·88	*h* 46·94	*h* 46·91	*h* 46·74	*h* 47·11	$\frac{1}{w}$ = 0·04
			h 46·37	*l* 49·29							
	46·99	47·62	48·06	47·78	47·89	48·17	47·12	47·27	47·07	47·19	*C* = 80° 56′ 47″·53
VI (Ánúr) and VIII (Kittávar)	*h* 53·25	*h* 53·81	*l* 52·09	*l* 52·44	*h* 51·79	*h* 51·03	*h* 52·89	*h* 53·18	*h* 52·27	*h* 53·02	*M* = 52″·62
	h 51·55	*h* 52·48	*l* 51·55	*l* 52·06	*h* 52·37	*h* 51·13	*h* 52·78	*h* 53·56	*h* 53·12	*h* 52·62	*w* = 29·71
	h 53·92	*h* 52·55	*l* 52·14	*h* 53·81	*h* 52·91	*h* 53·33	*h* 51·44	*h* 53·08	*h* 51·34	*h* 53·30	$\frac{1}{w}$ = 0·03
	h 53·54		*h* 53·26			*h* 52·43					
	53·07	52·95	52·26	52·77	52·36	51·98	52·37	53·27	52·24	52·98	*C* = 49° 23′ 52″·61

At VI (Ánúr)

**January* 1872; *observed by Major B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.
†*March* 1873; *observed by Lieut. J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	93° 24′	273° 25′	172° 37′	352° 38′	251° 49′	71° 49′	331° 1′	151° 1′	50° 13′	230° 13′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
	Circle readings, telescope being set on VIII (Kittávar)										
	″	″	″	″	″	″	″	″	″	″	
* VIII (Kittávar) and V (Ammĕdikal)	*l* 2·70	*l* 1·80	*l* 2·50	*l* 2·13	*l* 0·97	*l* 1·27	*l* 3·41	*l* 1·95	*l* 2·98	*l* 3·06	*M* = 2″·02
	l 0·07	*l* 1·01	*l* 1·52	*l* 2·21	*l* 2·54	*l* 1·13	*l* 3·30	*l* 1·95	*l* 2·59	*l* 1·68	*w* = 20·66
	l 1·72	*l* 1·66	*l* 3·54	*l* 2·63	*l* 2·69	*l* 0·87	*l* 2·29	*l* 1·09	*l* 2·25	*l* 0·69	$\frac{1}{w}$ = 0·05
	l 2·48									*l* 1·30	
	1·74	1·49	2·52	2·32	2·07	1·09	3·00	1·66	2·61	1·68	*C* = 52° 29′ 2″·02
† V (Ammĕdikal) and III (Kudurĕmukha)	*h* 28·75	*l* 29·69	*h* 31·39	*h* 29·69	*h* 31·86	*h* 30·19	*h* 29·15	*h* 30·75	*h* 30·63	*h* 29·99	*M* = 30″·37
	h 29·67	*h* 30·33	*h* 30·47	*h* 29·86	*h* 30·98	*h* 31·13	*h* 29·76	*h* 30·16	*h* 31·19	*h* 30·81	*w* = 23·92
	h 30·14	*h* 31·80	*h* 30·49	*h* 30·43	*h* 31·87	*h* 29·10	*h* 30·23	*h* 30·15	*h* 30·17	*h* 30·42	$\frac{1}{w}$ = 0·04
					l 31·38						
	29·52	30·61	30·78	29·99	31·52	30·14	29·71	30·35	30·66	30·41	*C* = 41° 49′ 30″·38

At VII (Muchil)

February 1872; *observed by Lieut. J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	0° 1′	180° 2′	79° 14′	259° 14′	158° 26′	338° 26′	237° 37′	57° 38′	316° 49′	136° 49′	*M* = Mean of Groups, *w* = Relative Weight, *C* = Concluded Angle
	Circle readings, telescope being set on IV (Ballamale)										
	″	″	″	″	″	″	″	″	″	″	
IV (Ballamale) and V (Ammĕdikal)	*h* 23·16	*h* 23·87	*l* 22·51	*l* 21·84	*l* 22·80	*l* 21·87	*h* 23·22	*h* 22·39	*l* 22·15	*l* 22·04	*M* = 22″·57
	h 21·36	*l* 23·84	*l* 22·53	*l* 23·12	*l* 21·53	*l* 23·79	*h* 22·25	*h* 21·99	*l* 21·73	*l* 22·87	*w* = 28·60
	l 22·88	*l* 23·46	*l* 23·95	*l* 22·24	*l* 23·22	*l* 21·92	*h* 22·27	*h* 22·12	*l* 23·21	*l* 21·00	$\frac{1}{w}$ = 0·03
	22·47	23·72	23·00	22·40	22·52	22·53	22·58	22·17	22·36	21·97	*C* = 77° 33′ 22″·57

At VII (Muchil)—(*Continued*).

Angle between	Circle readings, telescope being set on IV (Ballamale) 0° 1′	180° 2′	79° 14′	259° 14	158° 26′	338° 26′	237° 37′	57° 38′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
V (Ammĕdikal) and IX (Pushpagiri)	″ *h* 14·95 *h* 14·01 *h* 13·73	″ *h* 13·09 *l* 13·43 *l* 13·19	″ *l* 13·56 *l* 12·66 *l* 13·32	″ *l* 13·59 *l* 13·87 *l* 14·66	″ *l* 14·26 *l* 14·83 *l* 13·96	″ *l* 14·27 *l* 13·53 *l* 13·69	″ *h* 13·48 *h* 14·06 *h* 12·43	″ *h* 12·54 *h* 14·06 *h* 14·01	″ *l* 13·07 *l* 13·37 *l* 11·63	″ *l* 14·31 *l* 12·91 *l* 13·44	$M = 13''\cdot60$ $w = 27\cdot80$ $\frac{1}{w} = 0\cdot04$
	14·23	13·24	13·18	14·04	14·35	13·83	13·32	13·54	12·69	13·55	$C = 55° 48' 13''\cdot60$

At VIII (Kittávar)

January 1872; *observed by Major B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XI (Desáni) 0° 2′	180° 3′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 48′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XI (Desáni) and X (Sátanhalli)	″ *l* 50·42 *l* 49·49 *l* 50·39	″ *l* 48·59 *l* 50·88 *l* 50·64 *l* 48·86 *h* 50·36	″ *l* 49·39 *l* 50·15 *l* 50·04	″ *l* 50·26 *l* 50·16 *l* 50·99	″ *l* 50·02 *l* 49·90 *l* 49·37	″ *l* 50·70 *l* 51·11 *l* 50·38	″ *l* 49·54 *l* 49·21 *l* 51·35 *l* 48·11 *h* 50·32	″ *l* 49·57 *l* 49·52 *h* 50·61	″ *l* 49·52 *l* 49·97 *h* 48·73	″ *l* 50·91 *l* 50·52 *l* 49·34	$M = 50''\cdot01$ $w = 34\cdot98$ $\frac{1}{w} = 0\cdot03$
	50·10	49·87	49·86	50·47	49·76	50·73	49·71	49·90	49·41	50·26	$C = 59° 35' 50''\cdot00$
X (Sátanhalli) and IX (Pushpagiri)	*l* 33·09 *l* 32·57 *l* 32·16	*l* 33·09 *l* 34·02 *h* 34·45 *h* 31·74	*l* 34·96 *l* 34·44 *l* 33·92	*l* 33·10 *l* 33·43 *l* 32·30	*l* 31·26 *l* 32·35 *l* 31·97	*l* 32·26 *l* 32·02 *l* 33·84	*l* 33·94 *l* 34·33 *l* 32·06 *l* 34·31 *h* 33·34	*l* 33·78 *l* 34·44 *h* 31·94	*l* 31·99 *l* 33·20 *h* 34·28	*l* 32·51 *l* 32·42 *l* 33·59	$M = 33''\cdot09$ $w = 15\cdot22$ $\frac{1}{w} = 0\cdot07$
	32·61	33·33	34·44	32·94	31·86	32·71	33·60	33·39	33·16	32·84	$C = 76° 38' 33''\cdot10$
IX (Pushpagiri) and V (Ammĕdikal)	*h* 36·13 *h* 36·24 *h* 35·97	*h* 35·20 *h* 35·76 *h* 34·83	*l* 36·85 *l* 36·11 *l* 35·49 *l* 35·43	*l* 36·35 *l* 36·31 *l* 36·25 *h* 36·75	*l* 35·97 *l* 36·89 *l* 37·43	*l* 34·33 *l* 34·84 *l* 35·65 *h* 37·24	*h* 34·31 *h* 35·60 *h* 35·51 *h* 36·77	*h* 36·03 *h* 34·90 *h* 35·47	*l* 37·46 *l* 37·34 *l* 36·70	*l* 35·86 *l* 34·43 *l* 36·98	$M \doteq 36''\cdot00$ $w = 18\cdot94$ $\frac{1}{w} = 0\cdot05$
	36·11	35·26	35·97	36·42	36·76	35·51	35·55	35·47	37·17	35·76	$C = 57° 34' 36''\cdot00$
V (Ammĕdikal) and VI (Ánúr)	*h* 10·07 *h* 9·57 *h* 9·52 *h* 9·65	*h* 9·76 *h* 8·30 *h* 9·27	*l* 6·98 *l* 7·57 *h* 7·01 *h* 7·07	*l* 8·00 *l* 6·83 *h* 7·72	*l* 9·56 *l* 9·61 *l* 8·71	*l* 9·73 *h* 7·83 *h* 8·09 *l* 10·90	*h* 7·86 *h* 6·44 *h* 7·69 *h* 7·03	*h* 6·56 *h* 6·94 *h* 9·70 *h* 8·28	*l* 8·26 *l* 7·41 *l* 7·23 *l* 7·27	*l* 8·53 *l* 10·11 *l* 9·39	$M = 8''\cdot39$ $w = 8\cdot64$ $\frac{1}{w} = 0\cdot12$
	9·70	9·11	7·16	7·52	9·29	9·14	7·26	7·87	7·54	9·34	$C = 78° 7' 8''\cdot38$

At IX (Pushpagiri)

January 1872; *observed by Major B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on VII (Muchil) 204° 0′	24° 1′	283° 13′	103° 14′	2° 26′	182° 26′	81° 36′	261° 36′	160° 48′	340° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
VII (Muchil) and V (Ammĕdikal)	″ h 55·75 h 56·48 h 56·55	″ h 56·38 h 56·35 h 57·06	″ l 56·17 l 56·48 l 55·86	″ l 55·25 h 56·08 l 57·08	″ l 55·78 l 56·58 h 55·73	″ l 56·10 l 55·22 l 57·75	″ h 56·33 h 55·94 l 57·17	″ h 56·85 h 55·55 h 55·15	″ l 56·26 l 56·02 l 55·14	″ l 54·89 l 55·58 l 56·93	M = 56″·15 w = 47·60 1/w = 0·02
	56·26	56·60	56·17	56·14	56·03	56·36	56·48	55·85	55·81	55·80	C = 68° 26′ 56″·15
V (Ammĕdikal) and VIII (Kittávar)	h 48·88 h 46·85 h 48·62	h 48·00 h 48·47 h 47·84	l 49·26 l 47·87 l 48·16	l 49·00 l 49·05 h 48·70	l 47·70 l 48·29 l 47·91	l 49·06 l 48·93 l 48·09	h 47·07 l 46·90 l 47·64	h 46·83 h 48·41 h 48·07	l 48·51 l 47·16 l 47·85	l 49·65 l 49·45 l 49·55 h 47·74	M = 48″·21 w = 22·87 1/w = 0·04
	48·12	48·10	48·43	48·92	47·97	48·69	47·20	47·77	47·84	49·10	C = 43° 13′ 48″·22
VIII (Kittávar) and X (Sátanhalli)	h 55·24 h 55·93 h 54·42	h 55·47 h 54·33 h 56·00	l 54·02 l 54·86 l 55·86	l 54·68 l 54·16 h 55·28	l 54·30 l 54·59 l 54·02	l 54·67 l 54·79 l 55·77	h 57·17 h 56·64 l 55·49	h 57·01 h 54·33 l 54·16 l 54·67	l 54·50 l 56·59 l 54·36 h 55·87	l 53·90 l 54·43 l 53·97 h 54·86	M = 55″·06 w = 18·95 1/w = 0·05
	55·20	55·27	54·91	54·71	54·30	55·08	56·43	55·04	55·33	54·29	C = 55° 39′ 55″·06
X (Sátanhalli) and XII (Adhúrbĕtta)	h 35·52 h 35·54 h 35·72 h 36·85	h 34·92 h 35·47 h 34·79	l 35·49 l 35·26 l 34·28	l 35·45 l 35·86 l 36·87	l 36·96 l 35·96 l 36·32	l 34·35 l 34·69 l 34·72 h 35·15	h 35·74 h 34·44 h 34·62	h 36·10 h 35·64 l 35·46	l 35·64 l 34·66 l 36·65	l 36·63 l 35·68 l 35·25	M = 35″·53 w = 25·26 1/w = 0·04
	35·91	35·06	35·01	36·06	36·41	34·73	34·93	35·73	35·65	35·85	C = 36° 38′ 35″·53

At X (Sátanhalli)

**December* 1871; *observed by Major B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.
†*December* 1871; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIII (Nughallibĕtta) 0° 1′	180° 1′	79° 12′	259° 13′	158° 24′	338° 25′	237° 37′	57° 37′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* XIII (Nughallibĕtta) and XIV (Náráyandurga)	″ l 25·80 l 25·61 l 24·79	″ l 24·98 l 24·42 l 23·97 l 24·45	″ l 24·33 l 24·44 l 25·89	″ l 25·23 l 24·86 l 24·65	″ l 25·22 l 25·61 l 24·70	″ l 26·89 l 25·14 l 26·29	″ l 24·28 l 25·55 l 25·21	″ l 23·90 l 24·85 l 24·91 l 24·70	″ l 25·68 l 26·80 l 24·91	″ l 25·27 l 25·44 l 24·88	M = 25″·16 w = 28·94 1/w = 0·03
	25·40	24·46	24·89	24·91	25·18	26·11	25·01	24·59	25·80	25·20	C = 55° 29′ 25″·15

At X (Sátanhalli)—(*Continued*).

Angle between	Circle readings, telescope being set on XIII (Nughallibĕtta) 0° 1′	180° 1′	79° 12′	259° 13′	158° 24′	338° 25′	237° 37′	57° 37′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* XIV (Náráyandurga) and XII (Adhúrbĕtta)	″ *l* 36·08 *l* 36·44 *l* 35·01 *l* 36·79	″ *l* 37·54 *l* 38·87 *l* 38·65	″ *l* 35·38 *l* 35·53 *l* 36·59	″ *l* 35·75 *l* 35·81 *l* 36·36	″ *l* 36·65 *l* 36·22 *l* 37·19	″ *l* 38·10 *l* 37·66 *l* 37·04	″ *l* 38·00 *l* 35·98 *l* 35·67 *l* 37·09	″ *l* 38·00 *l* 36·37 *l* 36·98	″ *l* 36·66 *l* 34·29 *l* 36·30 *l* 35·21	″ *l* 37·05 *l* 35·60 *l* 36·43	$M = 36''\cdot63$ $w = 11\cdot55$ $\frac{1}{w} = 0\cdot09$
	36·08	38·35	35·83	35·97	36·69	37·60	36·69	37·12	35·62	36·36	$C = 60°\ 32'\ 36''\cdot62$
* XII (Adhúrbĕtta) and IX (Pushpagiri)	*l* 15·24 *l* 17·61 *l* 16·79	*l* 15·42 *l* 15·07 *l* 16·23	*l* 17·80 *l* 18·70 *l* 17·45	*l* 17·38 *l* 16·86 *l* 17·49	*l* 17·41 *l* 17·09 *l* 16·42	*l* 15·88 *l* 15·99 *l* 16·24	*l* 17·04 *l* 16·46 *l* 16·75	*l* 16·27 *l* 17·25 *l* 16·81	*l* 15·77 *l* 17·56 *l* 16·12	*l* 16·74 *l* 17·49 *l* 17·12	$M = 16''\cdot75$ $w = 18\cdot90$ $\frac{1}{w} = 0\cdot05$
	16·55	15·57	17·98	17·24	16·97	16·04	16·75	16·78	16·48	17·12	$C = 80°\ 4'\ 16''\cdot75$
* IX (Pushpagiri) and VIII (Kittávar)	*l* 38·27 *l* 38·39 *l* 37·67	*l* 38·98 *l* 37·87 *l* 39·22	*l* 38·25 *l* 38·33 *l* 38·56	*l* 38·17 *l* 38·53 *l* 38·08	*l* 38·55 *l* 38·74 *l* 39·68	*l* 38·18 *l* 37·56 *l* 36·93	*l* 38·78 *l* 40·23 *l* 39·77	*l* 38·38 *l* 39·63 *l* 38·37	*l* 39·51 *l* 39·57 *l* 38·20	*l* 38·13 *l* 38·56 *l* 37·99	$M = 38''\cdot57$ $w = 23\cdot80$ $\frac{1}{w} = 0\cdot04$
	38·11	38·69	38·38	38·26	38·99	37·56	39·59	38·79	39·09	38·23	$C = 47°\ 41'\ 38''\cdot57$
† VIII (Kittávar) and XI (Desáni)	*h* 30·62 *h* 31·87 *h* 31·39	*h* 30·58 *h* 30·89 *h* 29·32	*l* 29·08 *l* 29·04 *l* 32·69	*l* 31·07 *l* 30·94 *h* 30·19	*l* 29·99 *l* 30·35 *l* 31·12	*l* 32·17 *h* 30·31 *h* 30·41 *h* 30·87	*l* 29·46 *l* 31·10 *l* 29·72	*l* 29·82 *l* 31·40 *l* 29·34	*l* 30·70 *h* 29·16 *h* 29·45	*l* 29·71 *h* 29·21 *h* 30·78	$M = 30''\cdot39$ $w = 22\cdot54$ $\frac{1}{w} = 0\cdot04$
	31·29	30·26	30·27	30·73	30·49	30·94	30·09	30·19	29·77	29·90	$C = 53°\ 23'\ 30''\cdot40$
† XI (Desáni) and XIII (Nughallibĕtta)	*h* 33·16 *h* 33·11 *h* 32·70	*h* 33·09 *h* 33·60 *l* 32·29	*l* 32·53 *l* 32·87 *l* 33·10	*h* 33·31 *l* 33·55 *l* 33·17	*l* 32·33 *l* 32·42 *l* 33·27	*l* 32·18 *l* 32·50 *l* 34·63 *l* 34·77	*l* 31·13 *l* 33·04 *l* 30·92	*l* 34·72 *l* 32·76 *l* 31·40 *l* 31·54	*l* 32·07 *h* 33·08 *h* 30·92 *h* 34·60 *h* 32·92	*l* 31·71 *h* 33·34 *h* 33·94 *h* 35·28 *h* 34·88	$M = 32''\cdot92$ $w = 16\cdot46$ $\frac{1}{w} = 0\cdot06$
	32·99	32·99	32·83	33·34	32·67	33·52	31·70	32·61	32·72	33·83	$C = 62°\ 48'\ 32''\cdot94$

At XI (Desáni)

December 1871; *observed by Major B. R. Branfill with Troughton and Simms'* 24*-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIII (Nughallibĕtta) 110° 21′	290° 22′	189° 34′	9° 34′	268° 46′	88° 46′	347° 58′	167° 59′	67° 10′	247° 10′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XIII (Nughallibĕtta) and X (Sátanhalli)	″ *h* 26·52 *h* 27·11 *h* 28·39	″ *h* 26·51 *h* 27·31 *h* 26·79	″ *l* 27·94 *l* 28·07 *l* 28·50	″ *h* 28·51 *l* 26·94 *l* 26·58	″ *l* 27·21 *l* 27·84 *l* 26·72	″ *l* 26·54 *l* 26·06 *l* 26·25	″ *l* 26·57 *l* 27·05 *l* 26·94	″ *l* 26·30 *l* 27·85 *l* 27·14	″ *l* 27·43 *l* 27·78 *l* 27·03	″ *l* 28·49 *l* 28·33 *l* 28·29 *l* 28·00	$M = 27''\cdot29$ $w = 23\cdot41$ $\frac{1}{w} = 0\cdot04$
	27·34	26·87	28·17	27·34	27·26	26·28	26·85	27·10	27·41	28·28	$C = 43°\ 20'\ 27''\cdot29$

At XI (Desáni)—(*Continued*).

Angle between	Circle readings, telescope being set on XIII (Nughallibĕtta) 110° 21′	290° 22′	189° 34′	9° 34′	268° 46′	88° 46′	347° 58′	167° 59′	67° 10′	247° 10′	M = Mean of Groups w = Relative Weight C = Concluded Angle
X (Sátanhalli) and VIII (Kittávar)	″ h 44·25 h 43·93 h 43·49	″ h 43·31 h 43·86 h 44·63	″ l 44·59 l 44·92 l 44·09	″ h 45·17 l 45·54 l 45·87	″ l 45·68 l 44·73 l 45·58	″ l 44·20 l 44·61 l 45·18	″ l 44·39 l 45·50 l 44·41	″ l 46·21 l 45·14 l 45·61	″ l 45·09 l 43·98 l 45·01	″ l 44·35 l 44·86 l 45·17 l 45·35	$M = 44''·79$ $w = 23·86$ $\frac{1}{w} = 0·04$
	43·89	43·93	44·53	45·53	45·33	44·66	44·77	45·65	44·69	44·93	$C = 67° 0' 44''·79$

At XII (Adhúrbĕtta)

**December* 1871; *observed by Major B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.
†*December* 1871; *observed by Lieutenant J. R. McCullagh, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on IX (Pushpagiri) 0° 4′	180° 4′	79° 15′	259° 16′	158° 27′	338° 27′	237° 40′	57° 40′	316° 52′	136° 53′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* IX (Pushpagiri) and X (Sátanhalli)	″ l 14·42 l 13·70 l 14·09	″ l 13·63 l 15·60 l 13·11	″ h 14·99 l 13·65 l 15·35	″ h 14·87 h 14·15 l 13·44	″ h 14·33 h 14·14 h 15·40	″ h 15·73 h 14·54 h 12·25 h 14·61	″ h 14·72 h 12·96 l 13·33	″ h 13·20 h 13·63 l 14·80	″ l 14·37 l 14·00 l 14·65	″ l 14·25 l 14·30 l 13·56	$M = 14''·18$ $w = 36·30$ $\frac{1}{w} = 0·03$
	14·07	14·11	14·66	14·15	14·62	14·28	13·67	13·88	14·34	14·04	$C = 63° 17' 14''·18$
† X (Sátanhalli) and XIV (Náráyandurga)	l 11·89 l 11·82 l 12·29	l 11·53 l 14·23 l 13·20 l 14·34	l 11·15 l 10·36 l 11·51	l 13·40 l 12·79 l 11·44	l 12·59 l 12·93 l 12·81	l 12·59 l 12·97 l 11·60	l 12·04 l 12·37 l 11·68	l 12·05 l 11·90 l 11·37	l 11·23 l 12·63 l 13·64 l 13·94	l 11·57 l 12·69 l 11·30	$M = 12''·26$ $w = 16·94$ $\frac{1}{w} = 0·06$
	12·00	13·33	11·01	12·54	12·78	12·39	12·03	11·77	12·86	11·85	$C = 62° 19' 12''·27$

At XIII (Nughallibĕtta)

‡*April and May* 1868; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.
§*November and* ‖*December* 1871; *observed by Major B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XVI (Chaudanhalli) 0° 0′	180° 0′	79° 12′	259° 12′	158° 24′	338° 24′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
‡ XVI (Chaudanhalli) and XV (Háltibĕtta)	″ l 29·14 l 30·20 l 28·62	″ l 29·06 l 28·08 l 29·66	″ l 29·64 l 29·48 l 27·58 l 28·60	″ l 29·94 l 30·00 l 28·40	″ l 27·80 l 28·96 l 30·22 l 30·72	″ l 29·28 l 28·64 l 29·26	″ l 27·68 l 29·22 l 27·82	″ h 30·32 h 28·60 h 27·16 h 29·28 h 28·26	″ h 29·22 h 28·52 h 31·42 h 29·60 h 31·38	″ h 29·24 h 28·64 h 31·50 h 29·06	$M = 29''·16$ $w = 20·00$ $\frac{1}{w} = 0·05$
	29·32	28·93	28·83	29·45	29·42	29·06	28·24	28·72	30·03	29·61	$C = 67° 56' 29''·18$

At XIII (Nughallibĕtta)—(*Continued*).

Angle between	Circle readings, telescope being set on XVI (Chaudanhalli) 0°0′	180°0′	79°12′	259°12′	158°24′	338°24′	237°36′	57°36′	316°48′	136°48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
‡ XV (Háltibĕtta) and XIV (Náráyandurga)	″ l 42·94 l 42·68 l 42·52	″ l 45·82 l 45·50 l 43·02 l 43·82	″ l 42·16 l 42·80 l 43·42	″ l 43·16 l 43·86 l 43·06	″ l 44·06 l 44·26 l 42·62	″ l 44·76 l 43·68 l 43·44	″ l 43·98 l 42·76 l 44·86 l 43·76	″ l 43·36 h 42·86 h 43·68	″ h 44·74 h 45·96 h 44·16 h 42·90	″ h 43·54 h 43·40 h 41·32 h 43·66	$M = 43''\cdot56$ $w = 16\cdot42$ $\frac{1}{w} = 0\cdot06$
	42·71	44·54	42·79	43·36	43·65	43·96	43·84	43·30	44·44	42·98	$C = 43°\ 43'\ 43''\cdot57$
§ XIV (Náráyandurga) and X (Sátanhalli)	l 33·02 l 33·84 l 32·58	l 30·96 l 31·94 l 32·80	l 33·88 l 33·41 l 35·78	l 33·30 l 35·36 l 34·25	l 32·79 l 33·66 l 33·78	l 32·88 l 32·90 l 32·61	l 34·44 l 33·74 l 34·15	l 34·05 l 33·36 l 34·01	l 34·66 l 33·56 l 34·40 l 33·21	l 32·87 l 35·45 l 32·64 l 33·06	$M = 33''\cdot53$ $w = 13\cdot46$ $\frac{1}{w} = 0\cdot07$
	33·15	31·90	34·36	34·30	33·41	32·80	34·11	33·81	33·96	33·50	$C = 73°\ 45'\ 33''\cdot53$
‖ X (Sátanhalli) and XI (Desáni)	h 1·97 h 2·27 h 3·66 l 2·74	h 2·09 h 3·21 h 4·80 h 3·26	l 2·94 l 3·92 l 3·32	l 2·88 l 3·82 l 3·57	l 4·62 l 4·59 l 3·81	l 3·80 l 4·43 l 4·04	l 4·32 l 2·96 l 4·11	l 3·72 l 4·16 l 2·60 l 4·66	l 2·93 l 3·65 l 3·39	l 2·49 l 4·22 l 3·43 l 3·61	$M = 3''\cdot56$ $w = 30\cdot56$ $\frac{1}{w} = 0\cdot03$
	2·66	3·34	3·39	3·42	4·34	4·09	3·80	3·79	3·32	3·44	$C = 73°\ 51'\ 3''\cdot55$

At XIV (Náráyandurga)

**April* 1868; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

†*December* 1871; *observed by Major B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XII (Adhúrbĕtta) 238°38′	58°38′	317°50′	137°50′	87°2′	217°2′	116°13′	296°14′	195°26′	15°27′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XII (Adhúrbĕtta) and X (Sátanhalli)	″ l 12·70 l 14·57 l 15·11 l 13·93	″ l 14·02 l 13·31 l 14·30	″ l 15·47 l 12·87 l 13·57 l 14·63	″ l 14·21 l 14·31 l 14·26	″ l 15·32 l 16·51 h 14·82	″ l 13·11 l 13·06 h 13·78	″ l 13·70 l 13·19 l 13·19	″ l 12·95 l 13·92 l 13·77	″ l 14·51 l 14·72 l 15·89	″ l 13·46 l 14·21 l 14·83	$M = 14''\cdot14$ $w = 16\cdot06$ $\frac{1}{w} = 0\cdot06$
	14·08	13·88	14·14	14·26	15·55	13·32	13·36	13·55	15·04	14·17	$C = 57°\ 8'\ 14''\cdot14$
† X (Sátanhalli) and XIII (Nughallibĕtta)	l 4·21 l 5·69 l 4·97	l 3·69 l 3·71 l 5·63	l 3·36 l 5·82 l 4·83 l 4·75	l 3·64 l 2·69 l 3·96	l 4·34 l 3·79 h 3·76	l 5·04 l 3·84 h 3·56	l 3·73 l 4·30 l 4·16	l 4·53 l 4·32 l 4·68	l 4·31 l 4·13 l 4·22	l 4·85 l 4·63 l 4·41	$M = 4''\cdot30$ $w = 34\cdot75$ $\frac{1}{w} = 0\cdot03$
	4·96	4·34	4·69	3·43	3·96	4·15	4·06	4·51	4·22	4·63	$C = 50°\ 45'\ 4''\cdot30$

At XIV (Náráyandurga)—(*Continued*).

Angle between	Circle readings, telescope being set on XII (Adhúrbětta) 238° 38′	58° 38′	317° 50′	137° 50′	37° 2′	217° 2′	116° 13′	296° 14′	195° 26′	15° 27′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XIII (Nughallibětta) and XV (Háltibětta)	″ *l* 10·58 *l* 10·30 *l* 11·20	″ *h* 11·28 *h* 12·40 *l* 11·56 *l* 11·98	″ *l* 10·06 *l* 10·68 *l* 8·86	″ *l* 8·64 *l* 10·44 *l* 10·06	″ *l* 10·08 *l* 10·56 *l* 10·24	″ *l* 8·22 *l* 10·78 *h* 10·10 *h* 10·88	″ *h* 9·42 *h* 8·82 *l* 11·24 *l* 10·56	″ *l* 9·98 *l* 10·48 *l* 10·68	″ *h* 8·62 *h* 9·70 *h* 10·12	″ *h* 11·92 *h* 10·78 *h* 10·68 *h* 12·22	$M = 10''\cdot36$ $w = 14\cdot42$ $\frac{1}{w} = 0\cdot07$
	10·69	11·81	9·87	9·71	10·29	9·99	10·01	10·38	9·48	11·40	$C = 65^\circ\ 49'\ 10''\cdot37$
XV (Háltibětta) and XVII (Adhibětta)	*h* 35·78 *h* 36·80 *h* 36·56	*h* 35·38 *h* 36·96 *l* 34·82 *l* 35·60	*l* 36·90 *l* 36·24 *l* 36·54	*l* 37·10 *l* 36·98 *l* 36·94	*l* 37·52 *l* 36·06 *l* 37·48	*l* 38·26 *l* 38·02 *h* 35·26 *h* 36·74 *h* 35·82	*h* 36·00 *h* 38·40 *l* 36·94 *l* 35·12 *l* 34·98	*l* 36·64 *l* 36·50 *l* 36·92	*h* 35·62 *h* 35·12 *h* 34·82	*h* 35·40 *h* 37·70 *h* 37·62 *h* 36·12	$M = 36''\cdot44$ $w = 18\cdot58$ $\frac{1}{w} = 0\cdot05$
	36·38	35·69	36·56	37·01	37·02	36·82	36·29	36·69	35·19	36·71	$C = 64^\circ\ 55'\ 36''\cdot44$

At XV (Háltibětta)

April 1868; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XVII (Adhibětta) 0° 0′	180° 0′	79° 12′	259° 12′	158° 24′	338° 24′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVII (Adhibětta) and XIV (Náráyandurga)	″ *l* 12·70 *l* 12·14 *l* 14·32 *l* 14·34	″ *l* 14·28 *l* 15·08 *l* 13·08 *l* 14·40	″ *l* 12·90 *l* 11·60 *l* 14·00 *h* 13·92	″ *l* 13·74 *l* 14·72 *l* 14·02	″ *l* 13·08 *l* 11·84 *l* 11·16	″ *l* 14·94 *l* 13·16 *l* 13·28	″ *h* 13·40 *h* 12·16 *h* 12·70	″ *l* 14·84 *l* 13·22 *l* 14·02	″ *l* 11·70 *l* 12·52 *l* 14·98 *l* 14·00 *l* 13·84	″ *l* 14·70 *l* 14·08 *l* 15·20	$M = 13''\cdot55$ $w = 12\cdot31$ $\frac{1}{w} = 0\cdot08$
	13·38	14·21	13·10	14·16	12·03	13·79	12·75	14·03	13·41	14·66	$C = 48^\circ\ 57'\ 13''\cdot55$
XIV (Náráyandurga) and XIII (Nughallibětta)	*l* 10·20 *l* 8·76 *l* 8·28 *l* 7·24	*l* 8·86 *l* 6·22 *l* 8·40 *l* 8·88	*l* 12·00 *l* 8·42 *l* 10·00 *h* 7·04 *h* 7·18	*l* 7·32 *l* 7·60 *l* 8·40	*l* 8·06 *l* 9·34 *l* 7·76	*l* 6·66 *l* 8·34 *l* 7·78	*h* 6·00 *h* 7·62 *h* 7·70 *d* 6·70	*l* 8·82 *l* 7·14 *l* 6·96	*l* 9·26 *l* 9·46 *l* 8·34 *d* 8·39	*l* 6·38 *l* 7·88 *l* 7·62	$M = 8''\cdot02$ $w = 13\cdot61$ $\frac{1}{w} = 0\cdot07$
	8·62	8·09	8·93	7·77	8·39	7·59	7·01	7·64	8·86	7·29	$C = 70^\circ\ 27'\ 8''\cdot04$
XIII (Nughallibětta) and XVI (Chaudanhalli)	*l* 17·94 *l* 20·62 *l* 17·64 *l* 19·64	*l* 20·82 *l* 19·34 *l* 18·76 *l* 18·20	*l* 17·64 *l* 20·72 *l* 18·42 *h* 19·18 *h* 17·86	*l* 20·38 *l* 18·36 *l* 17·88 *l* 19·56	*l* 19·24 *l* 21·52 *l* 20·36 *l* 19·58	*l* 18·44 *l* 18·34 *l* 17·74	*h* 22·56 *h* 21·06 *h* 20·52 *d* 20·97	*l* 19·72 *l* 19·54 *l* 19·96	*l* 18·82 *l* 20·10 *l* 20·06 *d* 19·03	*l* 17·54 *l* 19·32 *l* 19·10	$M = 19''\cdot36$ $w = 10\cdot06$ $\frac{1}{w} = 0\cdot10$
	18·96	19·28	18·76	19·05	20·17	18·17	21·28	19·74	19·50	18·65	$C = 46^\circ\ 44'\ 19''\cdot37$

At XV (Háltibĕtta)—(*Continued*).

Angle between	Circle readings, telescope being set on XVII (Adhibĕtta) 0° 0′	180° 0′	79° 12′	259° 12′	158° 24′	338° 24′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XVI (Chaudanhalli) and XLIII (Rangaswámibĕtta)	*l* 12·12 *l* 9·40 *l* 10·66 *l* 10·64	*l* 11·96 *l* 11·72 *l* 10·78	*l* 11·00 *l* 10·90 *l* 9·92	*l* 10·36 *l* 10·82 *l* 11·80	*l* 10·58 *l* 10·36 *l* 9·88	*l* 13·10 *l* 11·40 *l* 10·50 *l* 11·26	*h* 9·58 *h* 11·24 *h* 12·18 *d* 10·59	*l* 10·78 *l* 10·44 *l* 9·02	*l* 11·20 *l* 8·88 *l* 11·28 *l* 12·32 *l* 10·30	*l* 11·60 *l* 12·94 *l* 12·78	M = 10″·99 w = 14·69 $\frac{1}{w}$ = 0·07
	10·71	11·49	10·61	10·99	10·27	11·56	10·90	10·08	10·80	12·44	C = 70° 8′ 10″·99
XLIII (Rangaswámibĕtta) and XLIV (Hemagiri)	*l* 32·46 *l* 32·44 *l* 33·80	*l* 32·18 *l* 30·74 *l* 30·70	*l* 31·32 *l* 30·80 *l* 30·38	*h* 30·22 *l* 33·06 *l* 32·48 *l* 32·08	*l* 33·04 *l* 32·30 *l* 32·14	*l* 31·72 *l* 30·62 *l* 33·66 *l* 31·74 *l* 32·06	*l* 31·62 *l* 30·18 *l* 31·74	*l* 30·20 *l* 32·78 *l* 31·96 *l* 33·48 *l* 33·80	*l* 32·12 *l* 33·94 *l* 31·32 *l* 31·42	*h* 31·18 *h* 31·36 *d* 29·30 *d* 30·08 *d* 29·86	M = 31″·75 w = 11·18 $\frac{1}{w}$ = 0·09
	32·90	31·21	30·83	31·96	32·49	31·96	31·18	32·44	32·20	30·36	C = 49° 40′ 31″·75
XLIV (Hemagiri) and XVII (Adhibĕtta)	*l* 36·34 *l* 35·32 *l* 34·92	*l* 33·14 *l* 36·10 *l* 37·50 *l* 37·66 *l* 34·54 *l* 35·98	*l* 37·12 *l* 35·82 *l* 37·40	*h* 36·96 *l* 34·84 *l* 35·56 *l* 36·14	*l* 36·06 *l* 36·56 *l* 35·80	*l* 35·02 *l* 37·06 *l* 35·22 *l* 36·72	*h* 35·76 *l* 36·46 *l* 37·08	*l* 38·38 *l* 34·84 *l* 38·72 *l* 35·42 *l* 35·44	*l* 35·90 *l* 34·42 *l* 33·36 *l* 33·94	*h* 37·30 *h* 35·22 *h* 35·84 *d* 34·60	M = 35″·93 w = 13·19 $\frac{1}{w}$ = 0·08
	35·53	35·82	36·78	35·88	36·14	36·00	36·43	36·56	34·41	35·74	C = 74° 2′ 35″·92

At XVI (Chaudanhalli)

April 1868; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIII (Rangaswámibĕtta) 0° 0′	180° 0′	79° 12′	259° 12′	158° 24′	338° 24′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XLIII (Rangaswámibĕtta) and XV (Háltibĕtta)	*l* 46·20 *l* 45·96 *l* 46·32	*l* 48·06 *l* 47·10 *l* 47·56	*l* 47·14 *l* 45·98 *l* 46·56	*l* 47·04 *l* 46·40 *l* 47·22	*l* 47·36 *l* 47·10 *l* 47·70	*l* 46·54 *l* 47·62 *l* 48·28	*l* 45·86 *l* 46·40 *l* 48·18 *l* 46·00	*l* 46·76 *l* 46·90 *l* 47·08	*l* 47·98 *l* 46·22 *l* 47·86	*l* 50·00 *l* 47·48 *l* 48·42 *l* 47·46	M = 47″·13 w = 19·12 $\frac{1}{w}$ = 0·05
	46·16	47·57	46·56	46·89	47·39	47·48	46·61	46·91	47·35	48·34	C = 43° 25′ 47″·13
XV (Háltibĕtta) and XIII (Nughallibĕtta)	*l* 12·12 *l* 11·52 *l* 16·80 *l* 13·88 *l* 13·46 *l* 14·20	*l* 16·22 *l* 12·58 *l* 13·90 *l* 13·58	*l* 14·94 *l* 13·38 *l* 13·66	*l* 12·94 *l* 13·74 *l* 12·56	*l* 14·72 *l* 13·86 *l* 14·34	*l* 14·20 *l* 13·74 *l* 13·44	*l* 14·06 *l* 13·98 *l* 12·80	*l* 14·68 *l* 12·48 *l* 12·98 *l* 13·12	*l* 11·86 *l* 11·68 *l* 13·28	*l* 12·38 *l* 11·66 *l* 12·78	M = 13″·44 w = 12·76 $\frac{1}{w}$ = 0·08
	13·66	14·07	13·99	13·08	14·31	13·79	13·61	13·32	12·27	12·27	C = 65° 19′ 13″·45

Note.—Stations XLIII (Rangaswámibĕtta) and XLIV (Hemagiri) appertain to the Great Arc Meridional Series, Section 8° to 18°.

At XVII (Adhibĕtta)

April 1868; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	0° 0′	180° 0′	79° 12′	259° 12′	158° 25′	338° 25′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XIV (Náráyandurga)										
XIV (Náráyandurga) and XV (Háltibĕtta)	″ h 10·84 l 10·92 l 11·48 l 12·60	″ l 12·52 l 12·48 l 12·32	″ l 12·00 l 11·26 l 12·36	″ l 11·76 l 11·88 l 12·28	″ l 11·64 l 11·64 l 11·78	″ l 13·22 l 12·86 l 12·82	″ l 12·18 l 11·32 l 12·50	″ l 12·22 l 13·32 l 12·52	″ l 12·84 l 12·92 l 12·48	″ l 12·70 l 12·58 l 12·62	$M = 12''\cdot25$ $w = 32\cdot40$ $\frac{1}{w} = 0\cdot03$
	11·46	12·44	11·87	11·97	11·69	12·97	12·00	12·69	12·75	12·63	$C = 66°\ 7'\ 12''\cdot25$
XV (Háltibĕtta) and XLIV (Hemagiri)	h 23·98 h 22·30 l 25·72 l 24·50 l 22·46	l 22·50 l 21·44 l 23·18	l 21·98 l 22·54 l 21·84	l 23·94 l 23·20 l 23·38	l 22·26 l 24·48 l 23·18 l 22·70	l 21·64 l 23·32 l 23·44	l 22·96 l 23·04 l 22·70	l 24·82 l 23·14 l 25·20 l 23·32	l 23·10 l 22·50 l 22·68	l 23·00 l 23·00 l 23·90	$M = 23''\cdot08$ $w = 18\cdot03$ $\frac{1}{w} = 0\cdot06$
	23·79	22·37	22·12	23·51	23·16	22·80	22·90	24·12	22·76	23·30	$C = 59°\ 5'\ 23''\cdot10$

At XLIII (Rangaswámibĕtta)

April 1868; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	0° 0′	180° 0′	79° 12′	259° 12′	158° 24′	338° 25′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XLIV (Hemagiri)										
XLIV (Hemagiri) and XV (Háltibĕtta)	″ h 4·04 h 3·28 h 5·54 h 4·94	″ h 5·74 h 5·40 h 6·14	″ l 5·28 l 6·48 l 4·92	″ l 4·54 l 6·60 l 6·46 l 4·82	″ l 5·60 l 7·18 l 6·20	″ l 6·68 l 6·00 l 8·26 l 7·50	″ h 4·94 h 5·76 h 6·34	″ h 5·92 h 6·84 h 6·38	″ l 6·62 l 7·22 l 7·94	″ l 6·64 l 6·62 l 7·50	$M = 6''\cdot11$ $w = 11\cdot15$ $\frac{1}{w} = 0\cdot09$
	4·45	5·76	5·56	5·61	6·33	7·11	5·68	6·38	7·26	6·92	$C = 73°\ 55'\ 6''\cdot10$
XV (Háltibĕtta) and XVI (Chaudanhalli)	l 3·32 l 4·28 l 3·98	l 3·62 l 4·12 l 3·36	l 4·98 l 4·20 l 4·70	l 4·80 l 3·52 l 3·00	l 1·84 l 2·68 l 3·10	l 4·24 l 4·74 l 2·70 l 3·66	h 3·08 h 5·30 h 3·44 h 3·08	h 4·00 h 3·34 h 4·02	l 4·26 l 1·26 l 2·72 l 2·98	l 2·80 l 3·52 l 2·60	$M = 3''\cdot56$ $w = 19\cdot23$ $\frac{1}{w} = 0\cdot05$
	3·86	3·70	4·63	3·77	2·54	3·84	3·72	3·79	2·81	2·97	$C = 66°\ 26'\ 3''\cdot56$

NOTE.—Stations XLIII (Rangaswámibĕtta) and XLIV (Hemagiri) appertain to the Great Arc Meridional Series, Section 8° to 18°.

At XLIV (Hemagiri)

March 1868; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XVII (Adhibĕtta) 103° 17′	283° 17′	182° 28′	2° 28′	261° 41′	81° 41′	340° 53′	160° 53′	60° 4′	240° 4′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVII (Adhibĕtta) and XV (Háltibĕtta)	″ h 61·80 h 62·06 h 63·40	″ h 61·56 h 61·52 h 61·72	″ l 61·66 l 62·58 l 64·18	″ l 61·46 l 61·92 l 60·88	″ l 60·56 l 61·84 l 61·44	″ l 61·64 l 58·86 l 60·40 l 60·86	″ l 59·48 l 60·26 l 60·88	″ l 60·56 l 62·92 l 60·42 l 61·56	″ l 62·00 l 60·08 l 59·26 l 60·32	″ l 61·58 l 61·08 l 61·72	$M = 61''\cdot34$ $w = 11\cdot18$ $\frac{1}{w} = 0\cdot09$
	62·42	61·60	62·81	61·42	61·28	60·44	60·21	61·37	60·41	61·46	$C = 46^\circ\ 52'\ 1''\cdot33$
XV (Háltibĕtta) and XLIII (Rangaswámibĕtta)	h 23·28 h 23·14 h 23·06	h 22·52 h 23·30 h 22·40	l 23·06 l 23·36 l 21·88	l 22·42 l 24·48 l 22·66 l 24·14	l 23·90 l 24·88 l 24·06	l 23·18 l 24·88 l 24·40	l 22·30 l 23·30 l 22·90	l 24·44 l 22·08 l 24·72 l 23·86	l 22·50 l 23·92 l 24·58 l 23·16	l 24·06 l 24·18 l 24·82	$M = 23''\cdot50$ $w = 18\cdot95$ $\frac{1}{w} = 0\cdot05$
	23·16	22·74	22·77	23·43	24·28	24·15	22·83	23·77	23·54	24·35	$C = 56^\circ\ 24'\ 23''\cdot50$

At XLVIII (Kolar)

**March* 1866; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.
†*January* 1867; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XIX (Kurudamale) 27° 55′	207° 55′	107° 7′	287° 7′	186° 19′	6° 19′	265° 31′	85° 31′	344° 43′	164° 43′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XIX (Kurudamale) and XVIII (Bandapalle)	″ h 45·12 h 43·74 h 43·62	″ h 39·64 l 38·34 l 41·52 l 42·86 l 37·54 l 39·12	″ l 45·12 l 44·14 l 45·60	″ l 43·46 l 42·62 l 42·94	″ h 42·70 h 43·96 h 43·36	″ h 42·02 h 42·22 h 42·30	″ h 43·74 h 44·70 h 44·28	″ h 43·20 h 43·48 h 42·28	″ h 39·94 h 42·92 h 43·72 h 40·66	″ h 44·34 h 41·52 h 45·24 h 42·10	$M = 42''\cdot98$ $w = 3\cdot98$ $\frac{1}{w} = 0\cdot25$
	44·16	39·84	44·95	43·01	43·34	42·18	44·24	42·99	41·81	43·30	$C = 27^\circ\ 54'\ 42''\cdot94$

Angle between	Circle readings, telescope being set on XVIII (Bandapalle) 311° 41′	131° 41′	30° 53′	210° 53′	110° 5′	290° 5′	189° 18′	9° 18′	268° 29′	88° 29′	
* XVIII (Bandapalle) and XLIX (Bhúpatamma)	″ l 30·00 l 31·72 l 30·52	″ l 31·08 l 29·70 l 30·20	″ l 29·74 l 30·28 l 31·06	″ l 30·50 l 31·80 l 31·70	″ l 29·80 l 31·40 l 31·36	″ l 31·16 l 30·44 l 30·64	″ l 29·86 l 30·08 l 30·20	″ l 31·14 l 29·78 l 29·56	″ l 31·60 l 32·16 l 29·96	″ l 32·40 l 29·28 l 30·08 l 30·38	$M = 30''\cdot64$ $w = 27\cdot43$ $\frac{1}{w} = 0\cdot04$
	30·75	30·33	30·36	31·33	30·85	30·75	30·05	30·16	31·24	30·54	$C = 74^\circ\ 59'\ 30''\cdot64$

NOTE.—Stations XLIII (Rangaswámibĕtta), XLIV (Hemagiri), XLVIII (Kolar) and XLIX (Bhúpatamma) appertain to the Great Arc Meridional Series, Section 8° to 18°.

At XLIX (Bhúpatamma)

March 1866; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLVIII (Kolar) 222° 0′	42° 0′	301° 12′	121° 12′	20° 24′	200° 24′	99° 36′	279° 35′	178° 48′	358° 47′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLVIII (Kolar) and XVIII (Bandapalle)	″ l 53·04 l 51·44 l 52·00	″ l 52·40 l 52·62 l 51·40	″ l 54·12 l 53·82 l 53·42	″ l 53·70 l 52·64 l 53·26	″ l 52·26 l 54·70 l 52·46	″ l 51·64 l 52·22 l 51·52	″ l 53·32 l 54·16 l 53·88	″ l 52·98 l 53·52 l 53·42	″ l 54·00 l 53·22 l 53·90	″ l 51·86 l 53·28 l 52·66	M = 52″·96 w = 15·40 1/w = 0·07
	52·16	52·14	53·79	53·20	53·14	51·79	53·79	53·31	53·71	52·60	C = 71° 16′ 52″·96
XVIII (Bandapalle) and XX (Yĕrrakŏnda)	l 25·70 l 25·68 l 25·02	l 26·06 l 27·16 l 24·90	l 25·74 l 25·10 l 26·94	l 25·54 l 25·04 l 25·48	l 24·50 l 25·02 l 25·44	l 27·02 l 25·78 l 25·64	l 27·50 l 26·10 l 26·24	l 24·76 l 25·12 l 26·20	l 27·28 l 25·24 l 25·88	l 26·74 l 25·04 l 25·64	M = 25″·78 w = 26·30 1/w = 0·04
	25·47	26·04	25·93	25·35	24·99	26·15	26·61	25·36	26·13	25·81	C = 53° 1′ 25″·78

At XVIII (Bandapalle)

**March* 1866; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.
†*January* 1867; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIX (Bhúpatamma) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* XLIX (Bhúpatamma) and XLVIII (Kolar)	″ l 36·36 l 35·56 l 38·12	″ l 38·82 l 36·38 l 36·86	″ l 37·00 l 36·20 l 37·30	″ h 38·14 l 37·36 l 36·52	″ l 36·36 l 36·08 l 35·16	″ l 37·20 l 36·76 l 37·14	″ l 36·86 l 39·28 l 39·50	″ l 35·98 l 36·30 l 37·38	″ l 37·40 l 36·88 l 37·36	″ l 36·30 l 36·16 l 36·14	M = 36″·96 w = 13·90 1/w = 0·07
	36·68	37·35	36·83	37·34	35·87	37·03	38·55	36·55	37·21	36·20	C = 33° 43′ 36″·96

Angle between	Circle readings, telescope being set on XLVIII (Kolar) 82° 52′	262° 52′	162° 4′	342° 4′	241° 16′	61° 16′	320° 28′	140° 28′	39° 40′	219° 40′	
† XLVIII (Kolar) and XIX (Kurudamale)	″ h 22·64 h 22·98 h 22·08	″ h 22·30 h 22·14 h 23·40	″ l 25·42 l 22·92 l 24·18	″ l 24·88 l 26·14 l 24·62	″ l 22·62 l 23·26 l 24·24	″ l 25·06 l 25·42 l 24·64	″ l 21·16 l 23·28 l 22·36	″ l 22·70 l 24·18 l 23·78	″ l 24·50 l 25·02 l 26·70	″ h 22·88 h 23·06 h 22·12	M = 23″·69 w = 6·30 1/w = 0·16
	22·57	22·61	24·17	25·21	23·37	25·04	22·27	23·55	25·41	22·69	C = 82° 51′ 23″·69
† XIX (Kurudamale) and XXI (Káraveri)	h 55·30 h 55·26 h 56·02	h 54·86 h 56·22 l 54·60	l 53·12 l 56·30 l 54·74 l 56·44	l 56·00 l 57·32 l 57·10	l 56·14 l 54·52 l 53·46	l 53·62 l 56·32 l 55·68	l 53·96 l 56·74 l 55·66	l 53·46 l 57·08 l 56·06 l 55·90	l 55·26 l 55·02 l 55·36	l 56·64 l 56·16 l 54·36	M = 55″·47 w = 15·82 1/w = 0·06
	55·53	55·23	55·15	56·81	54·71	55·21	55·45	55·63	55·21	55·72	C = 66° 57′ 55″·47

NOTE.—Stations XLVIII (Kolar) and XLIX (Bhúpatamma) appertain to the Great Arc Meridional Series, Section 8° to 18°.

At XVIII (Bandapalle)—(*Continued*).

Angle between	Circle readings, telescope being set on XXI (Káraveri) 176° 28′	356° 28′	255° 41′	75° 41′	334° 52′	154° 52′	54° 4′	234° 4′	133° 16′	313° 16′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* XXI (Káraveri) and XXII (Krishnamakŏnda)	″ l 51·20 l 51·82 l 51·44	″ l 51·78 l 51·42 l 51·24	″ l 52·58 l 51·00 l 51·50	″ l 51·80 l 50·68 l 50·94	″ l 52·30 l 51·78 l 51·60	″ l 53·56 l 51·60 l 53·24	″ l 51·10 l 50·50 l 50·30	″ l 49·38 l 51·48 l 51·46	″ l 48·18 l 49·46 l 50·20	″ l 51·82 l 49·00 l 50·30	$M = 51''{\cdot}15$ $w = 9\ {\cdot}30$ $\frac{1}{w} = 0\ {\cdot}11$
	51·49	51·48	51·69	51·14	51·89	52·80	50·63	50·77	49·28	50·37	$C = 51^\circ 41' 51''{\cdot}15$
* XXII (Krishnamakŏnda) and XX (Yĕrrakŏnda)	l 58·96 l 58·92 l 58·30	l 59·30 l 59·08 l 60·02	l 59·32 l 60·18 l 59·58	l 58·80 l 58·30 l 60·38	l 58·84 l 58·68 l 59·96	l 57·56 l 58·38 l 57·72	l 59·58 l 59·12 l 57·18	l 60·12 l 58·10 l 58·96	l 61·14 l 60·00 l 60·06	l 57·36 l 59·42 l 58·92	$M = 59''{\cdot}08$ $w = 15\ {\cdot}90$ $\frac{1}{w} = 0\ {\cdot}06$
	58·73	59·47	59·69	59·16	59·16	57·89	58·63	59·06	60·40	58·57	$C = 70^\circ 54' 59''{\cdot}08$
* XX (Yĕrrakŏnda) and XLIX (Bhúpatamma)	l 14·16 l 14·08 l 12·96	l 13·02 l 14·70 l 14·10	l 13·30 l 12·82 l 12·00	h 14·10 l 12·72 l 13·08	l 13·30 l 13·30 l 13·56	l 13·38 l 13·46 l 13·36	l 14·88 l 12·58 l 15·08	l 12·56 l 14·64 l 12·86	l 12·94 l 13·96 l 13·94	l 15·94 l 15·38 l 14·34	$M = 13''{\cdot}68$ $w = 16\ {\cdot}70$ $\frac{1}{w} = 0\ {\cdot}06$
	13·73	13·94	12·71	13·30	13·39	13·40	14·18	13·35	13·61	15·22	$C = 53^\circ 50' 13''{\cdot}68$

At XIX (Kurudamale)

January 1867; *observed by Lieutenant W. M. Campbell, R.E., with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXI (Káraveri) 71° 18′	251° 18′	150° 30′	330° 30′	229° 42′	49° 42′	308° 54′	128° 54′	28° 6′	208° 6′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXI (Káraveri) and XVIII (Bandapalle)	″ h 45·22 h 43·86 h 44·60	″ h 47·00 h 45·88 h 46·04	″ l 47·90 l 46·04 l 45·74	″ l 45·08 l 45·62 l 46·32	″ l 44·56 l 45·38 l 45·72	″ l 44·00 l 44·56 l 45·12	″ l 45·12 l 45·42 l 46·16	″ l 44·82 l 46·14 l 45·40	″ h 44·00 h 43·06 h 43·72	″ h 46·56 h 44·44 h 44·96	$M = 45''{\cdot}28$ $w = 11\ {\cdot}30$ $\frac{1}{w} = 0\ {\cdot}09$
	44·56	46·31	46·56	45·67	45·22	44·56	45·57	45·45	43·59	45·32	$C = 71^\circ 17' 45''{\cdot}28$
XVIII (Bandapalle) and XLVIII (Kolar)	h 53·00 h 54·86 h 54·12	h 53·32 h 54·14 h 52·22	l 52·20 l 54·22 l 53·66	l 54·48 l 53·96 l 53·66	l 53·98 l 53·02 l 52·94	l 53·70 l 54·28 l 53·54	l 54·98 l 54·06 l 53·84	l 54·60 l 54·22 l 54·20	h 54·84 h 54·34 h 56·48	h 53·28 h 54·68 h 55·00	$M = 53''{\cdot}99$ $w = 19\ {\cdot}60$ $\frac{1}{w} = 0\ {\cdot}05$
	53·99	53·23	53·36	54·03	53·31	53·84	54·29	54·34	55·22	54·32	$C = 69^\circ 13' 53''{\cdot}99$

Note.—Stations XLVIII (Kolar) and XLIX (Bhúpatamma) appertain to the Great Arc Meridional Series, Section 8° to 18°.

At XX (Yĕrrakŏnda)

February 1866; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIX (Bhúpatamma) 125° 27′	305° 27′	204° 39′	24° 39′	283° 51′	103° 51′	3° 3′	183° 3′	82° 14′	262° 14′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XLIX (Bhúpatamma) and XVIII (Bandapalle)	h 22·06	h 21·86	l 21·28	l 20·64	l 21·60	l 21·72	l 21·22	l 21·26	l 21·80	l 21·18	$M = 21''·17$
	h 22·34	h 22·32	l 18·62	l 20·66	l 20·94	l 20·62	l 20·42	l 21·40	l 21·18	l 21·04	$w = 16·40$
	h 22·34	h 22·46	l 19·86	l 20·16	l 19·76	l 21·00	l 21·96	l 20·56	l 21·92	l 21·00	$\frac{1}{w} = 0·06$
	22·25	22·21	19·92	20·49	20·77	21·11	21·20	21·07	21·63	21·07	$C = 73° 8' 21''·17$
XVIII (Bandapalle) and XXII (Krishnamakŏnda)	h 36·38	h 34·92	l 36·54	l 36·48	l 36·18	l 36·06	l 35·98	l 36·66	l 36·28	l 36·56	$M = 36''·00$
	h 35·28	h 35·96	l 36·58	l 34·86	l 34·66	l 34·34	l 36·58	l 36·20	l 37·30	l 37·10	$w = 22·70$
	h 36·06	h 34·66	l 36·06	l 36·04	l 36·14	l 34·88	l 35·58	l 36·24	l 36·32	l 36·98	$\frac{1}{w} = 0·04$
	35·91	35·18	36·39	35·79	35·66	35·09	36·05	36·37	36·63	36·88	$C = 52° 17' 36''·00$

At XXI (Káraveri)

February 1866; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXIV (Patikŏnda) 0° 0′	180° 0′	79° 12′	259° 12′	158° 25′	338° 24′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXIV (Patikŏnda) and XXIII (Devarakŏnda)	l 39·98	l 40·66	l 41·48	l 41·70	l 38·96	l 40·40	l 40·80	l 41·56	l 41·90	l 38·60	$M = 40''·54$
	l 38·36	l 41·22	l 39·76	l 42·02	l 39·34	l 40·86	l 41·14	l 40·24	l 39·04	l 40·50	$w = 14·10$
	l 41·30	l 40·64	l 38·96	l 42·28	l 41·54	l 39·86	l 40·60	l 41·54	l 40·80	l 40·06	$\frac{1}{w} = 0·07$
	39·88	40·84	40·07	42·00	39·95	40·37	40·85	41·11	40·58	39·72	$C = 41° 9' 40''·54$
XXIII (Devarakŏnda) and XXII (Krishnamakŏnda)	l 10·20	l 9·42	l 9·54	l 8·92	l 10·54	l 10·58	l 9·36	l 8·24	l 8·18	l 10·40	$M = 9''·35$
	l 8·00	l 9·88	l 10·12	l 8·68	l 10·40	l 8·78	l 8·24	l 8·26	l 9·62	l 9·00	$w = 13·50$
	l 9·16	l 9·90	l 10·76	l 8·04	l 10·98	l 10·42	l 7·62	l 8·18	l 9·92	l 9·02	$\frac{1}{w} = 0·07$
	9·12	9·73	10·14	8·55	10·64	9·93	8·41	8·23	9·24	9·47	$C = 77° 11' 9''·35$
XXII (Krishnamakŏnda) and XVIII (Bandapalle)	l 23·62	l 23·74	l 22·08	l 22·66	l 23·22	l 22·40	l 22·08	l 23·14	l 23·42	l 22·28	$M = 22''·49$
	l 23·76	l 21·54	l 24·88	l 22·90	l 21·72	l 23·12	l 22·40	l 22·82	l 21·70	l 19·82	$w = 12·70$
	l 22·86	l 22·26	l 23·30	l 23·40	l 21·28	l 21·84	l 21·36	l 22·80	l 21·94	l 20·32	$\frac{1}{w} = 0·08$
	23·41	22·51	23·42	22·99	22·07	22·45	21·95	22·92	22·35	20·81	$C = 71° 20' 22''·49$

NOTE.—Station XLIX (Bhúpatamma) appertains to the Great Arc Meridional Series, Section 8° to 18°.

At XXI (Káraveri)—(*Continued*).

Angle between	Circle readings, telescope being set on XXIV (Patikŏnda) 0° 0′	180° 0′	79° 12′	259° 12′	158° 25′	338° 24′	237° 36′	57° 36′	316° 48′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XVIII (Bandapalle) and XIX (Kurudamale)	″ *l* 20·62 *l* 22·12 *l* 21·22	″ *l* 19·34 *l* 20·14 *l* 20·30	″ *l* 23·24 *l* 20·10 *l* 20·64 *l* 22·06	″ *l* 22·04 *l* 21·32 *l* 20·88	″ *l* 19·34 *l* 21·36 *l* 20·48	″ *l* 20·70 *l* 20·20 *l* 20·60	″ *l* 22·18 *l* 22·96 *l* 22·50	″ *l* 20·80 *l* 20·16 *l* 20·80	″ *l* 20·24 *l* 20·42 *l* 20·78	″ *l* 20·90 *l* 20·88 *l* 22·28	$M = 21''\cdot00$ $w = 13\cdot96$ $\frac{1}{w} = 0\cdot07$
	21·32	19·93	21·51	21·41	20·39	20·50	22·55	20·59	20·48	21·35	$C = 41^\circ 44' 21''\cdot00$

At XXII (Krishnamakŏnda)

February 1866; *observed by Captain B. R. Branfill with Troughton and Simms*' 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XX (Yĕrrakŏnda) 0° 1′	180° 0′	79° 12′	259° 12′	158° 25′	338° 25′	237° 37′	57° 36′	316° 49′	136° 48′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XX (Yĕrrakŏnda) and XVIII (Bandapalle)	″ *l* 26·04 *l* 25·22 *l* 26·54	″ *l* 24·40 *l* 25·82 *l* 27·06	″ *l* 26·58 *l* 24·92 *l* 27·20	″ *l* 27·72 *l* 26·38 *l* 27·54	″ *l* 25·42 *l* 24·66 *l* 23·98	″ *l* 25·22 *l* 26·34 *l* 25·92	″ *l* 25·86 *l* 27·80 *l* 24·66 *l* 25·54	″ *l* 29·14 *l* 25·40 *l* 26·00 *l* 25·40	″ *l* 25·26 *l* 25·76 *l* 25·98	″ *l* 24·94 *l* 24·38 *l* 24·76	$M = 25''\cdot85$ $w = 12\cdot08$ $\frac{1}{w} = 0\cdot08$
	25·93	25·76	26·23	27·21	24·69	25·83	25·97	26·48	25·67	24·69	$C = 56^\circ 47' 25''\cdot86$
XVIII (Bandapalle) and XXI (Káraveri)	*l* 45·34 *l* 45·50 *l* 44·42	*l* 46·36 *l* 46·06 *l* 45·08	*l* 44·54 *l* 44·66 *l* 45·18	*l* 45·38 *l* 45·86 *l* 45·14	*l* 45·90 *l* 46·44 *l* 46·92	*l* 47·12 *l* 46·34 *l* 47·64	*l* 45·88 *l* 45·42 *l* 46·54	*l* 43·20 *l* 46·22 *l* 45·74 *l* 46·82	*l* 46·62 *l* 46·04 *l* 46·08	*l* 46·26 *l* 47·28 *l* 46·26	$M = 45''\cdot89$ $w = 15\cdot98$ $\frac{1}{w} = 0\cdot06$
	45·09	45·83	44·79	45·46	46·42	47·03	45·95	45·50	46·25	46·60	$C = 56^\circ 57' 45''\cdot89$
XXI (Káraveri) and XXIII (Devarakŏnda)	*l* 33·24 *l* 33·56 *l* 33·84	*l* 34·26 *l* 32·60 *l* 33·56	*l* 34·50 *l* 34·80 *l* 33·06	*l* 32·94 *l* 33·12 *l* 33·60	*l* 33·20 *l* 34·10 *l* 33·12	*l* 33·02 *l* 32·32 *l* 32·44	*l* 33·16 *l* 33·22 *l* 33·26	*l* 32·40 *l* 32·58 *l* 32·62	*l* 32·02 *l* 32·70 *l* 33·38	*l* 33·18 *l* 32·90 *l* 33·28	$M = 33''\cdot20$ $w = 33\cdot30$ $\frac{1}{w} = 0\cdot03$
	33·55	33·47	34·12	33·22	33·47	32·59	33·21	32·53	32·70	33·12	$C = 45^\circ 28' 33''\cdot20$
XXIII (Devarakŏnda) and XXVI (Satghur)	*l* 34·70 *l* 32·84 *l* 33·08	*l* 31·90 *l* 32·02 *l* 33·40	*l* 32·28 *l* 32·92 *l* 33·64	*l* 33·92 *l* 34·24 *l* 33·46	*l* 33·30 *l* 32·16 *l* 33·38	*l* 32·76 *l* 33·80 *l* 34·28	*l* 32·00 *l* 32·46 *l* 32·84	*l* 31·84 *l* 32·90 *l* 34·14	*l* 32·70 *l* 32·34 *l* 33·08	*l* 32·50 *l* 33·62 *l* 33·82	$M = 33''\cdot08$ $w = 27\cdot00$ $\frac{1}{w} = 0\cdot04$
	33·54	32·44	32·95	33·87	32·95	33·61	32·43	32·96	32·71	33·31	$C = 38^\circ 50' 33''\cdot08$

At XXIII (Devarakŏnda)

February 1866; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XXV (Mugali)										
XXV (Mugali) and XXVI (Satghur)	″ l 27·40 l 27·64 l 25·70	″ h 26·14 h 25·26 h 26·84	″ l 28·00 l 27·90 l 27·82	″ l 28·14 l 28·18 l 28·14	″ l 26·30 l 27·00 l 26·48	″ l 26·78 l 26·18 l 26·92	″ l 27·88 l 24·78 l 26·46 l 27·38	″ h 27·16 h 25·70 h 25·98	″ l 27·66 l 27·96 l 27·30	″ l 28·16 l 27·28 l 28·50	$M = 27''·08$ $w = 14·16$ $\frac{1}{w} = 0·07$
	26·91	26·08	27·91	28·15	26·59	26·63	26·63	26·28	27·64	27·98	$C = 88° 31' 27''·08$
XXVI (Satghur) and XXII (Krishnamakŏnda)	l 2·72 l 1·70 l 2·98	h 2·12 h 3·02 h 1·96	l 1·44 l 1·28 l 1·18	l 1·54 l 0·22 l 0·50	l 3·78 l 2·98 l 3·42	l 1·10 l 3·10 l 1·92	l 2·92 l 2·66 l 3·70 l 2·92	h 2·18 h 2·88 h 1·80	l 2·08 l 1·36 l 2·28	l 1·44 l 1·82 l 0·94	$M = 2''·10$ $w = 13·94$ $\frac{1}{w} = 0·07$
	2·47	2·37	1·30	0·75	3·39	2·04	3·05	2·29	1·91	1·40	$C = 80° 28' 2''·10$
XXII (Krishnamakŏnda) and XXI (Káraveri)	l 18·16 l 19·54 l 19·48	h 16·46 h 18·40 h 17·82	l 18·72 l 18·06 l 18·30	l 18·62 l 18·90 l 19·80	l 17·04 l 16·90 l 17·04	l 18·02 l 17·44 l 16·18	l 18·60 l 18·16 l 17·62	h 18·34 h 17·10 h 18·24	l 16·30 l 17·52 l 17·64	l 17·78 l 17·46 l 18·18	$M = 17''·93$ $w = 15·20$ $\frac{1}{w} = 0·07$
	19·06	17·56	18·36	19·11	16·99	17·21	18·13	17·89	17·15	17·81	$C = 57° 20' 17''·93$
XXI (Káraveri) and XXIV (Patikŏnda)	l 20·24 l 19·56 l 20·52	h 23·64 h 20·70 h 21·10	l 22·02 l 22·02 l 21·30	l 21·52 l 22·52 l 22·80	l 22·32 l 23·56 l 22·00	l 22·32 l 22·76 l 23·80	l 20·60 l 21·04 l 21·34	h 22·44 h 23·40 h 21·26	l 23·38 l 23·00 l 23·42	l 22·32 l 22·68 l 23·18	$M = 22''·09$ $w = 9·40$ $\frac{1}{w} = 0·11$
	20·11	21·81	21·78	22·28	22·63	22·96	20·99	22·37	23·27	22·73	$C = 58° 19' 22''·09$
XXIV (Patikŏnda) and XXV (Mugali)	l 52·52 l 51·54 l 51·02	h 51·16 h 52·02 h 50·60	l 48·96 l 51·18 l 50·96	l 49·92 l 49·54 l 49·16	l 49·82 l 51·60 l 50·58	l 51·24 l 51·34 l 50·44	l 50·46 l 52·76 l 51·22	h 50·82 h 51·20 h 51·60	l 50·40 l 49·68 l 49·12	l 50·46 l 50·08 l 49·38	$M = 50''·67$ $w = 14·10$ $\frac{1}{w} = 0·07$
	51·69	51·26	50·37	49·54	50·47	51·01	51·48	51·21	49·73	49·97	$C = 75° 20' 50''·67$

At XXIV (Patikŏnda)

February 1866; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	153° 45′	333° 45′	232° 57′	52° 56′	312° 9′	132° 9′	31° 21′	211° 21′	110° 33′	290° 33′	M = Mean of Groups w = Relative Weight C = Concluded Angle
	Circle readings, telescope being set on XXV (Mugali)										
XXV (Mugali) and XXIII (Devarakŏnda)	″ l 7·30 l 9·88 l 8·54 l 10·52	″ l 8·00 l 10·22 l 9·98	″ l 10·82 l 8·98 l 9·00	″ l 10·34 l 11·52 l 11·68	″ l 9·92 l 10·32 l 9·08	″ l 10·60 l 9·28 l 10·08	″ l 9·26 l 8·44 l 8·94	″ l 10·06 l 9·50 l 11·14	″ l 9·30 l 9·84 l 9·70	″ l 10·08 l 11·14 l 10·20	$M = 9''·82$ $w = 15·32$ $\frac{1}{w} = 0·07$
	9·06	9·40	9·60	11·18	9·77	9·99	8·88	10·23	9·61	10·47	$C = 73° 13' 9''·81$

At XXIV (Patikŏnda)—(*Continued*).

Angle between	Circle readings, telescope being set on XXV (Mugali) 153° 45′	333° 45′	232° 57′	52° 56′	312° 9′	132° 9′	31° 21′	211° 21′	110° 33′	290° 33′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXIII (Devarakŏnda) and XXI (Káraveri)	″ l 57·66 l 57·42 l 57·02	″ l 58·38 l 57·32 l 58·10	″ l 57·06 l 55·56 l 58·46 l 54·66 l 56·42	″ l 57·46 l 57·26 l 55·30	″ l 57·92 l 57·60 l 56·72	″ l 57·82 l 55·40 l 55·22	″ l 57·30 l 58·48 l 56·78	″ l 57·98 l 58·02 l 56·60	″ l 57·14 l 57·92 l 57·84	″ l 57·14 l 57·48 l 57·04	$M = 57''\cdot 19$ $w = 18\cdot 55$ $\frac{1}{w} = 0\cdot 05$
	57·37	57·93	56·43	56·67	57·41	56·15	57·52	57·53	57·63	57·22	$C = 80° 30' 57''\cdot 18$

At XXV (Mugali)

February 1866; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXVIII (Muruktŏre) 0° 1′	180° 1′	79° 12′	259° 12′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	*M* = Mean of Groups *w* = Relative Weight *C* = Concluded Angle
XXVIII (Muruktŏre) and XXVII (Batinkŏnda)	″ l 60·16 l 60·26 l 59·72	″ l 60·62 l 60·92 l 60·70	″ l 60·48 l 60·36 l 59·46	″ l 61·70 l 61·38 l 59·90	″ l 59·00 l 59·70 h 62·06 h 61·00	″ l 60·02 l 58·98 l 60·30	″ l 60·58 l 61·38 l 60·44	″ l 60·64 l 59·78 l 60·08	″ l 61·40 l 60·24 l 60·64	″ l 60·72 l 61·08 l 60·92	$M = 60''\cdot 47$ $w = 33\cdot 67$ $\frac{1}{w} = 0\cdot 03$
	60·05	60·75	60·10	60·99	60·44	59·77	60·80	60·17	60·76	60·91	$C = 47° 55' 0''\cdot 47$
XXVII (Batinkŏnda) and XXVI (Satghur)	l 24·56 l 24·42 l 24·16	l 22·30 l 22·14 l 23·18	l 23·64 l 24·02 l 24·04	l 22·42 l 21·84 l 23·72	l 24·78 l 22·52 l 23·80	l 23·76 l 24·48 l 24·44	l 22·76 l 23·20 l 23·36	l 22·60 l 23·28 l 22·74	l 23·08 l 22·90 l 23·40	l 22·96 l 21·38 l 22·94	$M = 23''\cdot 30$ $w = 16\cdot 70$ $\frac{1}{w} = 0\cdot 06$
	24·38	22·54	23·90	22·66	23·70	24·23	23·11	22·87	23·13	22·43	$C = 84° 19' 23''\cdot 30$
XXVI (Satghur) and XXIII (Devarakŏnda)	l 24·60 l 24·16 l 25·10	l 26·68 l 26·42 l 26·32	l 24·90 l 25·14 l 25·14	l 25·86 l 26·54 l 26·34	l 25·22 l 27·06 l 26·34	l 25·70 l 26·36 l 24·86	l 26·14 l 25·40 l 25·32	l 26·16 l 25·78 l 25·84	l 25·68 l 26·30 l 26·32	l 25·38 l 24·98 l 25·32	$M = 25''\cdot 71$ $w = 25\cdot 00$ $\frac{1}{w} = 0\cdot 04$
	24·62	26·47	25·06	26·25	26·21	25·64	25·62	25·93	26·10	25·23	$C = 39° 20' 25''\cdot 71$
XXIII (Devarakŏnda) and XXIV (Patikŏnda)	l 61·44 l 61·70 l 61·42	l 60·40 l 61·18 l 59·88	l 61·94 l 61·48 l 61·90	l 60·38 l 61·00 l 60·22	l 60·74 l 61·70 l 60·70	l 60·82 l 60·42 l 60·76	l 59·92 l 60·26 l 60·40	l 60·52 l 60·24 l 61·00	l 60·54 l 60·74 l 60·08	l 60·24 l 61·54 l 60·20	$M = 60''\cdot 79$ $w = 34\cdot 50$ $\frac{1}{w} = 0\cdot 03$
	61·52	60·49	61·77	60·53	61·05	60·67	60·19	60·59	60·45	60·66	$C = 31° 26' 0''\cdot 79$

At XXVI (Satghur)

***February* 1866; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XXII (Krishnamakŏnda) 201° 22′	21° 22′	280° 34′	100° 34′	359° 46′	179° 46′	78° 58′	258° 58′	158° 11′	338° 11′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXII (Krishnamakŏnda) and XXIII (Devarakŏnda)	"	"	"	"	"	"	"	"	"	"	
	l 24·64	*h* 24·64	*l* 24·72	*l* 26·76	*h* 25·00	*h* 25·48	*l* 26·04	*l* 27·26	*l* 23·82	*l* 26·52	$M = 25''·52$
	l 25·00	*l* 26·66	*l* 25·26	*l* 25·62	*h* 25·28	*h* 24·74	*l* 26·14	*l* 25·04	*l* 24·72	*l* 25·20	$w = 21·70$
	l 25·58	*l* 25·52	*l* 25·56	*l* 26·12	*h* 26·06	*l* 26·50	*l* 25·82	*l* 25·06	*l* 24·12	*l* 26·56	$\frac{1}{w} = 0·05$
	25·07	25·61	25·18	26·17	25·45	25·57	26·00	25·79	24·22	26·09	$C = 60° 41' 25''·52$
XXIII (Devarakŏnda) and XXV (Mugali)	*l* 7·20	*h* 7·88	*l* 9·00	*l* 8·54	*h* 8·40	*h* 9·70	*l* 7·06	*l* 6·14	*l* 10·42	*l* 8·50	$M = 8''·61$
	l 9·32	*h* 8·88	*l* 9·24	*l* 9·82	*h* 8·88	*h* 9·08	*l* 6·96	*l* 7·76	*l* 10·26	*l* 9·04	$w = 9·60$
	l 7·66	*l* 7·62	*l* 7·76	*l* 8·00	*h* 7·44	*h* 9·00	*l* 9·12	*l* 8·48	*l* 11·48	*l* 9·48	$\frac{1}{w} = 0·10$
	8·06	8·13	8·67	8·79	8·24	9·26	7·71	7·46	10·72	9·01	$C = 52° 8' 8''·61$
XXV (Mugali) and XXVII (Batinkŏnda)	*l* 24·12	*h* 24·24	*l* 22·94	*l* 22·46	*h* 24·48	*h* 24·54	*l* 24·38	*l* 25·70	*l* 22·98	*l* 23·88	$M = 23''·67$
	l 23·50	*h* 26·06	*l* 22·70	*l* 22·44	*h* 23·82	*h* 24·74	*l* 24·18	*l* 24·86	*l* 22·22	*l* 23·36	$w = 9·80$
	l 22·88	*l* 25·00	*l* 23·64	*l* 22·08	*l* 24·02	*h* 24·70	*l* 22·58	*l* 23·42	*l* 22·74	*l* 21·48	$\frac{1}{w} = 0·10$
	23·50	25·10	23·09	22·33	24·11	24·66	23·71	24·66	22·65	22·91	$C = 58° 10' 23''·67$
XXVII (Batinkŏnda) and XXIX (Kailásgarh)	*l* 57·62	*h* 56·54	*l* 55·96	*l* 58·20	*h* 56·68	*h* 53·80	*l* 56·94	*l* 55·76	*l* 56·44	*l* 55·48	$M = 56''·35$
	l 56·72	*h* 53·12	*l* 56·28	*l* 56·58	*h* 55·82	*h* 54·84	*l* 57·20	*l* 56·14	*l* 59·56	*l* 56·54	$w = 6·76$
	l 57·18	*l* 54·46	*l* 55·78	*l* 57·74	*l* 55·60	*h* 53·60	*l* 58·06	*l* 57·36	*l* 55·04	*l* 57·60	$\frac{1}{w} = 0·15$
		l 56·20							*l* 57·90		
	57·17	55·08	56·01	57·51	56·03	54·08	57·40	56·42	57·24	56·54	$C = 30° 21' 56''·35$

At XXVII (Batinkŏnda)

***January* 1866; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XXV (Mugali) 0° 1′	180° 1′	79° 13′	259° 12′	158° 25′	338° 25′	237° 36′	57° 36′	316° 49′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
XXV (Mugali) and XXVIII (Muruktŏre)	"	"	"	"	"	"	"	"	"	"	
	h 2·26	*l* 1·60	*l* 2·44	*l* 2·92	*l* 2·72	*l* 3·02	*l* 2·30	*h* 2·50	*l* 1·72	*l* 2·08	$M = 2''·42$
	h 1·92	*l* 2·06	*l* 2·38	*l* 4·00	*l* 2·14	*l* 2·78	*l* 3·70	*h* 1·68	*l* 2·56	*l* 2·22	$w = 37·00$
	h 2·60	*l* 1·46	*l* 2·78	*l* 3·40	*h* 1·52	*l* 2·38	*l* 1·78	*l* 2·60	*l* 2·38	*l* 2·82	$\frac{1}{w} = 0·03$
	2·26	1·71	2·53	3·44	2·13	2·73	2·59	2·26	2·22	2·37	$C = 56° 44' 2''·42$
XXVIII (Muruktŏre) and XXX (Pullúr)	*h* 8·36	*l* 8·96	*l* 8·56	*l* 8·86	*l* 6·86	*l* 8·08	*l* 8·58	*h* 8·94	*l* 8·54	*l* 9·82	$M = 8''·53$
	h 8·36	*l* 9·04	*l* 8·50	*l* 9·50	*l* 8·02	*l* 8·58	*l* 7·58	*h* 8·36	*l* 9·44	*l* 8·04	$w = 25·60$
	h 7·84	*l* 9·20	*l* 8·38	*l* 8·54	*h* 7·50	*l* 8·14	*l* 7·58	*l* 8·64	*l* 9·72	*l* 9·34	$\frac{1}{w} = 0·04$
	8·19	9·07	8·48	8·97	7·46	8·27	7·91	8·65	9·23	9·07	$C = 54° 7' 8''·53$

At XXVII (Batinkŏnda)—(*Continued*).

Angle between	Circle readings, telescope being set on XXV (Mugali) 0° 1′	180° 1′	79° 13′	259° 12′	158° 25′	338° 25′	237° 36′	57° 36′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXX (Pullúr) and XXXI (Anandalamalai)	h 27·70	l 27·14	l 26·98	l 26·10	l 28·86	l 27·26	l 26·38	h 26·02	l 26·42	l 25·56	$M = 26''\cdot88$
	h 27·54	l 27·54	l 27·00	l 26·04	l 27·52	l 26·74	l 27·52	h 25·76	l 27·04	l 27·06	$w = 27\cdot80$
	h 27·22	l 26·50	l 26·86	l 26·88	h 26·70	l 27·16	l 27·58	l 27·00	l 26·52	l 25·66	$\frac{1}{w} = 0\cdot04$
	27·49	27·06	26·95	26·34	27·69	27·05	27·16	26·26	26·66	26·09	$C = 59° 44' 26''\cdot88$
XXXI (Anandalamalai) and XXIX (Kailásgarh)	h 32·70	l 30·08	l 29·16	l 30·02	l 29·22	l 29·00	l 29·72	h 30·74	l 28·66	l 30·14	$M = 29''\cdot76$
	h 29·10	l 29·20	l 29·94	l 29·72	l 29·98	l 29·64	l 29·86	h 30·68	l 29·38	l 30·06	$w = 34\cdot90$
	h 30·28	l 29·80	l 29·82	l 30·00	h 29·10	l 29·82	l 28·88	l 28·66	l 29·58	l 30·22	$\frac{1}{w} = 0\cdot03$
	h 30·04										
	30·53	29·69	29·64	29·91	29·43	29·49	29·49	30·03	29·21	30·14	$C = 84° 4' 29''\cdot77$
XXIX (Kailásgarh) and XXVI (Satghur)	h 35·56	l 38·76	l 39·20	l 37·58	l 39·16	l 36·82	l 39·48	h 37·54	l 37·34	l 38·14	$M = 38''\cdot32$
	h 37·48	l 38·38	l 37·30	l 37·80	l 39·28	l 38·64	l 39·06	h 39·22	l 38·64	l 38·12	$w = 14\cdot90$
	h 37·00	l 39·42	l 39·24	l 37·62	h 38·60	l 39·54	l 39·06	l 38·36	l 39·24	l 38·08	$\frac{1}{w} = 0\cdot07$
	36·68	38·85	38·58	37·67	39·01	38·33	39·20	38·37	38·41	38·11	$C = 67° 49' 38''\cdot32$
XXVI (Satghur) and XXV (Mugali)	h 13·84	l 12·92	l 13·42	l 14·74	l 13·32	l 14·06	l 13·10	h 15·38	l 14·70	l 13·90	$M = 13''\cdot89$
	h 15·16	l 14·02	l 14·36	l 14·72	l 14·06	l 13·04	l 12·66	h 12·90	l 13·34	l 13·84	$w = 24\cdot40$
	h 14·60	l 13·50	l 13·10	l 13·84	h 15·84	l 12·76	l 13·94	l 14·82	l 12·80	l 14·02	$\frac{1}{w} = 0\cdot04$
	14·53	13·48	13·63	14·43	14·41	13·29	13·23	14·37	13·61	13·92	$C = 37° 30' 13''\cdot89$

At XXVIII (Muruktŏre)

January 1866; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXX (Pullúr) 153° 16′	333° 16′	232° 29′	52° 29′	311° 41′	131° 40′	30° 53′	210° 52′	110° 5′	290° 5′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXX (Pullúr) and XXVII (Batinkŏnda)	h 3·34	h 3·56	l 4·54	l 2·50	l 4·84	l 2·46	l 4·50	l 2·30	l 3·54	l 1·92	$M = 3''\cdot33$
	h 2·86	h 2·14	l 2·54	l 3·02	l 4·42	l 2·88	l 4·66	l 2·44	l 2·04	l 4·88	$w = 17\cdot90$
	h 3·72	l 2·78	l 3·18	l 2·42	l 4·16	l 3·52	l 3·80	l 2·90	l 4·22	l 3·92	$\frac{1}{w} = 0\cdot06$
	3·31	2·83	3·42	2·65	4·47	2·95	4·32	2·55	3·27	3·57	$C = 77° 55' 3''\cdot33$
XXVII (Batinkŏnda) and XXV (Mugali)	h 60·28	h 59·92	l 59·18	l 59·86	l 59·74	l 58·22	l 57·96	l 59·56	l 60·36	l 59·58	$M = 59''\cdot38$
	h 60·48	l 59·86	l 58·30	l 60·02	l 57·68	l 60·20	l 58·60	l 59·50	l 59·30	l 58·40	$w = 20\cdot00$
	h 61·22	l 59·22	l 57·96	l 59·30	l 59·60	l 59·10	l 59·88	l 59·96	l 59·40	l 58·74	$\frac{1}{w} = 0\cdot05$
	60·66	59·67	58·48	59·73	59·01	59·17	58·81	59·67	59·69	58·91	$C = 75° 20' 59''\cdot38$

At XXIX (Kailásgarh)

January 1866; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXVI (Satghur) 0° 1′	180° 1′	79° 13′	259° 12′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXVI (Satghur) and XXVII (Batinkōnda)	″	″	″	″	″	″	″	″	″	″	
	l 27·64	*l* 26·54	*l* 27·36	*l* 27·84	*l* 26·58	*h* 29·08	*l* 27·94	*l* 26·62	*l* 27·76	*l* 27·40	$M = 27''\cdot68$
	l 28·00	*l* 28·00	*l* 28·64	*l* 28·52	*l* 26·68	*h* 26·72	*l* 26·38	*l* 27·70	*l* 27·98	*l* 28·74	$w = 21\cdot86$
	l 29·20	*l* 27·46	*l* 27·58	*l* 27·88	*l* 26·40	*h* 28·92	*l* 27·80	*l* 27·60	*l* 29·48	*l* 26·86	$\frac{1}{w} = 0\cdot05$
						h 27·20					
	28·28	27·33	27·86	28·08	26·55	27·98	27·37	27·31	28·41	27·67	$C = 81^\circ 48' 27''\cdot68$
XXVII (Batinkōnda) and XXXI (Anandalamalai)	*l* 49·64	*l* 49·74	*l* 48·30	*l* 49·34	*l* 49·88	*h* 50·22	*l* 48·34	*l* 49·76	*l* 48·70	*l* 49·64	$M = 49''\cdot01$
	l 48·50	*l* 49·18	*l* 49·30	*l* 48·28	*l* 49·74	*h* 50·46	*l* 47·90	*l* 49·52	*l* 46·12	*l* 50·08	$w = 19\cdot01$
	l 49·22	*l* 48·82	*l* 48·46	*l* 49·06	*l* 50·04	*h* 48·50	*l* 48·84	*l* 48·46	*l* 48·40	*l* 47·84	$\frac{1}{w} = 0\cdot05$
						h 49·60					
	49·12	49·25	48·69	48·89	49·89	49·70	48·36	49·25	47·74	49·19	$C = 61^\circ 39' 49''\cdot01$

At XXX (Pullúr)

**April* 1865 *and* †*January* 1866; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIII (Nagari) 113° 42′	293° 42′	192° 55′	12° 55′	272° 7′	92° 6′	351° 18′	171° 18′	70° 30′	250° 30′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
* XXXIII (Nagari) and XXXII (Kurumkota)	″	″	″	″	″	″	″	″	″	″	
	h 61·40	*h* 60·04	*h* 63·24	*h* 61·00	*h* 61·06	*h* 60·76	*l* 61·90	*l* 59·64	*l* 63·78	*l* 58·90	$M = 61''\cdot19$
	h 61·18	*h* 63·14	*h* 62·76	*h* 61·24	*h* 61·00	*h* 61·50	*l* 59·60	*l* 60·74	*l* 60·84	*h* 60·54	$w = 9\cdot96$
	h 60·40	*h* 60·02	*h* 62·30	*h* 61·52	*h* 61·36	*l* 61·80	*l* 59·64	*l* 61·18	*l* 63·08	*h* 60·74	$\frac{1}{w} = 0\cdot10$
		h 60·06									
	60·99	60·82	62·77	61·25	61·14	61·35	60·38	60·52	62·57	60·06	$C = 57^\circ 46' 1''\cdot19$
* XXXII (Kurumkota) and XXXI (Anandalamalai)	*h* 46·92	*h* 46·32	*h* 44·24	*h* 44·38	*h* 46·96	*h* 45·42	*l* 43·70	*l* 47·06	*l* 44·30	*l* 46·58	$M = 45''\cdot68$
	h 46·44	*h* 45·34	*h* 44·28	*h* 44·12	*h* 45·98	*h* 44·94	*l* 46·60	*l* 45·94	*l* 47·20	*h* 46·00	$w = 10\cdot24$
	h 47·68	*h* 46·66	*h* 44·62	*h* 44·64*	*h* 46·46	*l* 44·82	*l* 45·20	*l* 45·28	*l* 45·46	*h* 45·80	$\frac{1}{w} = 0\cdot10$
		h 47·40									
	47·01	46·43	44·38	44·38	46·47	45·06	45·17	46·09	45·65	46·13	$C = 55^\circ 55' 45''\cdot68$
† XXXI (Anandalamalai) and XXVII (Batinkōnda)	*h* 60·30	*h* 60·80	*l* 60·68	*l* 61·98	*l* 58·52	*l* 60·72	*h* 62·08	*h* 60·10	*l* 60·26	*l* 58·92	$M = 60''\cdot23$
	h 61·36	*h* 60·56	*l* 59·34	*l* 60·22	*l* 59·10	*l* 59·48	*h* 60·28	*h* 58·40	*l* 60·82	*l* 59·18	$w = 12\cdot70$
	h 61·38	*h* 61·36	*l* 60·50	*l* 60·42	*l* 58·60	*l* 60·22	*h* 61·02	*h* 59·78	*l* 60·70	*l* 59·74	$\frac{1}{w} = 0\cdot08$
	61·01	60·91	60·17	60·87	58·74	60·14	61·13	59·43	60·59	59·28	$C = 56^\circ 18' 0''\cdot23$

At XXX (Pullúr)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXIII (Nagari) 113° 42′	293° 42	192° 55′	12° 55′	272° 7′	92° 6′	351° 18′	171° 18′	70° 30′	250° 30′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XXVII (Batinkŏnda) and XXVIII (Muruktŏre)	″ h 47·40 h 47·02 h 47·24	″ h 48·08 h 47·02 h 47·84	″ l 49·94 l 49·90 l 48·50	″ l 47·88 l 50·24 l 48·24	″ l 50·96 l 49·40 l 49·24	″ l 51·54 l 49·04 l 49·64	″ h 48·58 h 49·08 h 49·00	″ h 48·58 h 49·00 h 49·44	″ l 48·62 l 49·20 l 48·74	″ l 49·18 l 47·98 l 48·62	$M = 48''\cdot 84$ $w = 10\cdot 80$ $\frac{1}{w} = 0\cdot 09$
	47·22	47·65	49·45	48·79	49·87	50·07	48·89	49·01	48·85	48·59.	$C = 47° 57' 48''\cdot 84$

At XXXI (Anandalamalai)

**April* 1865 *and* †*January* 1866; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXIX (Kailásgarh) 114° 33′	294° 33′	193° 45′	13° 45′	272° 57′	92° 57′	352° 9′	172° 9′	71° 26′	251° 26′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XXIX (Kailásgarh) and XXVII (Batinkŏnda)	″ l 42·68 l 42·50 l 43·30	″ l 42·80 l 42·64 l 42·10	″ l 41·96 l 44·22 l 41·76	″ h 41·86 h 42·28 h 42·52	″ l 42·16 l 43·04 l 41·58	″ l 43·18 l 41·62 l 43·20	″ l 41·06 h 42·94 h 40·06	″ h 42·82 h 43·30 h 42·84	″ l 40·56 l 41·60 l 42·82	″ l 44·24 l 43·80 l 43·58	$M = 42''\cdot 50$ $w = 15\cdot 20$ $\frac{1}{w} = 0\cdot 07$
	42·83	42·51	42·65	42·22	42·26	42·67	41·35	42·99	41·66	43·87	$C = 34° 15' 42''\cdot 50$
† XXVII (Batinkŏnda) and XXX (Pullúr)	l 36·30 l 36·58 l 35·10	l 36·32 l 35·18 l 36·02	l 35·62 l 33·90 l 33·86 l 33·78	l 36·14 l 35·42 l 35·20	l 37·08 l 35·88 l 36·30	l 35·48 l 35·72 l 36·60	l 34·40 l 36·76 l 35·62	l 36·06 l 36·60 l 36·24	l 36·36 l 36·66 l 36·62	l 34·94 l 34·62 l 35·14	$M = 35''\cdot 74$ $w = 16\cdot 96$ $\frac{1}{w} = 0\cdot 06$
	35·99	35·84	34·29	35·59	36·42	35·93	35·59	36·30	36·55	34·90	$C = 63° 57' 35''\cdot 73$

Angle between	Circle readings, telescope being set on XXX (Pullúr) 133° 14′	313° 13′	212° 25′	32° 25′	291° 38′	111° 38′	10° 50′	190° 49′	90° 2′	270° 2′	
* XXX (Pullúr) and XXXII (Kurumkota)	″ h 60·16 h 58·06 h 60·82 h 62·36	″ h 63·76 h 64·34 h 64·92 h 65·32	″ l 62·82 l 63·84 l 63·22	″ l 63·02 l 62·94 l 63·46	″ l 64·30 l 62·82 l 63·42	″ l 64·74 l 63·16 l 63·94	″ l 63·64 h 63·84 h 63·66	″ h 62·54 h 64·48 h 62·30 h 62·04	″ l 63·06 l 64·08 l 63·96	″ l 63·60 l 63·52 l 63·76	$M = 63''\cdot 27$ $w = 6\cdot 86$ $\frac{1}{w} = 0\cdot 15$
	60·35	64·59	63·29	63·14	63·51	63·95	63·71	62·84	63·70	63·63	$C = 79° 58' 3''\cdot 26$
* XXXII (Kurumkota) and XXXIV (Mávandúr)	h 40·40 h 41·98 h 37·70 h 38·74	h 41·22 h 37·92 h 39·76 h 39·52	h 38·48 l 38·34 l 38·48 l 39·06	l 37·84 l 39·00 l 38·10	l 38·32 l 38·12 l 37·82	l 38·32 l 38·58 l 37·96	l 39·10 h 37·88 h 37·20	h 41·20 h 37·14 h 37·36 h 39·00	l 39·04 l 38·72 l 39·08	l 39·66 l 39·42 l 40·02	$M = 38''\cdot 80$ $w = 14\cdot 30$ $\frac{1}{w} = 0\cdot 07$
	39·71	39·60	38·59	38·31	38·09	38·29	38·06	38·68	38·95	39·70	$C = 53° 14' 38''\cdot 81$

At XXXI (Anandalamalai)—(*Continued*).

Angle between	Circle readings, telescope being set on XXIX (Kailásgarh) 114° 33′	294° 33′	193° 45′	13° 45′	272° 57′	92° 57′	352° 9′	172° 9′	71° 26′	251° 26′	M = Mean of Groups w = Relative Weight C = Concluded Angle
† XXX (Pullúr) and R. M.	″ l 22·78 l 22·52 l 23·46	″ l 22·92 l 22·26 l 22·54	″ l 23·38 l 22·06 l 23·20 l 23·82	″ l 22·38 l 22·78 l 22·76	″ l 23·88 l 23·24 l 25·00	″ l 24·12 l 22·86 l 22·00	″ l 23·96 l 23·38 l 23·42	″ l 23·54 l 23·78 l 22·54	″ l 22·76 l 23·06 l 23·26	″ l 23·20 l 23·82 l 22·90	$M = 23''\cdot15$ $w = 35\cdot98$ $\frac{1}{w} = 0\cdot03$
	22·92	22·57	23·12	22·64	24·04	22·99	23·59	23·29	23·03	23·31	$C = 16°\ 19'\ 23''\cdot15$

At XXXII (Kurumkota)

April 1865; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXVI (Malaipedu) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXVI (Malaipedu) and XXXIV (Mávandúr)	″ l 52·04 l 50·84 l 52·64	″ l 51·58 l 52·42 l 51·56	″ l 50·92 l 50·90 l 51·50	″ l 52·14 l 53·72 l 52·50	″ l 47·24 l 49·20 l 50·16 l 50·74	″ l 51·84 l 50·94 l 51·92	″ l 51·96 l 51·06 l 50·22 l 52·80	″ l 50·34 l 50·28 l 50·68	″ l 52·36 l 50·18 l 49·82 l 50·46	″ l 49·62 l 50·72 l 51·30	$M = 51''\cdot17$ $w = 8\cdot95$ $\frac{1}{w} = 0\cdot11$
	51·84	51·85	51·11	52·79	49·34	51·57	51·51	50·43	50·70	50·55	$C = 78°\ 46'\ 51''\cdot16$
XXXIV (Mávandúr) and XXXI (Anandalamalai)	l 31·30 l 31·20 l 30·66	l 30·90 l 30·72 l 30·22	l 31·66 l 31·50 l 30·70	l 31·64 l 29·24 l 30·42	l 31·12 l 30·74 l 30·60	l 31·92 l 32·94 l 31·10	l 29·80 l 30·22 l 31·04 l 30·02	l 32·74 l 31·54 l 31·36	l 30·30 l 32·76 l 31·96 l 33·98	l 29·88 l 31·42 l 30·78	$M = 31''\cdot13$ $w = 15\cdot38$ $\frac{1}{w} = 0\cdot07$
	31·05	30·61	31·29	30·43	30·82	31·99	30·27	31·88	32·25	30·69	$C = 57°\ 8'\ 31''\cdot13$
XXXI (Anandalamalai) and XXX (Pullúr)	l 13·16 l 14·84 l 15·14	l 14·34 l 14·38 l 15·60	l 14·28 l 14·56 l 13·82	l 12·04 l 15·52 l 15·22	l 13·64 l 15·56 l 14·48	l 13·92 l 14·54 l 14·84	l 15·92 l 15·70 l 15·18 l 15·78	l 13·10 l 14·56 l 14·56	l 16·54 l 13·58 l 14·86 l 14·16	l 14·46 l 13·96 l 14·88 l 14·94	$M = 14''\cdot57$ $w = 25\cdot42$ $\frac{1}{w} = 0\cdot04$
	14·38	14·77	14·22	14·26	14·56	14·43	15·65	14·07	14·78	14·56	$C = 44°\ 6'\ 14''\cdot59$
XXX (Pullúr) and XXXIII (Nagari)	l 53·40 l 51·76 l 51·96	l 52·54 l 52·36 l 52·34	l 52·16 l 51·86 l 53·26	l 54·26 l 51·66 l 50·72	l 53·52 l 52·14 l 52·00	l 52·92 l 51·54 l 52·28	l 53·34 l 53·06 l 52·48 l 53·24	l 51·90 h 52·56 l 53·04	l 50·72 l 54·38 l 52·16 l 52·36	l 53·72 l 54·08 l 52·82 l 53·00	$M = 52''\cdot56$ $w = 29\cdot45$ $\frac{1}{w} = 0\cdot03$
	52·37	52·41	52·43	52·21	52·55	52·25	53·03	52·50	52·41	53·40	$C = 40°\ 8'\ 52''\cdot58$

NOTE.—R. M. denotes Referring Mark.

At XXXII (Kurumkota)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXVI (Malaipedu) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXIII (Nagari) and XXXV (Chĕmbedu)	″ *l* 11·96 *l* 13·58 *l* 12·82	″ *l* 13·34 *l* 13·50 *l* 12·44	″ *l* 13·34 *l* 12·98 *l* 13·08	″ *l* 12·46 *l* 12·06 *l* 14·38	″ *l* 10·54 *l* 11·86 *l* 13·10 *l* 14·30 *l* 13·46	″ *l* 12·92 *l* 13·04 *l* 13·86	″ *l* 11·88 *l* 12·94 *l* 12·48	″ *l* 14·70 *h* 14·60 *l* 12·92 *l* 11·98	″ *l* 11·58 *l* 12·02 *l* 11·92	″ *l* 12·14 *l* 11·66 *l* 11·72	$M = 12''·76$ $w = 19·01$ $\frac{1}{w} = 0·05$
	12·79	13·09	13·13	12·97	12·65	13·27	12·43	13·55	11·84	11·84	$C = 70° 27′ 12''·77$
XXXV (Chĕmbedu) and XXXVI (Malaipedu)	*l* 17·66 *l* 16·06 *l* 17·70	*l* 17·14 *l* 16·82 *l* 17·54	*l* 17·82 *l* 18·10 *l* 17·48	*l* 17·74 *l* 17·22 *l* 17·54	*l* 20·80 *l* 18·76 *l* 17·88 *l* 16·40 *l* 16·52	*l* 16·74 *l* 17·46 *l* 16·90	*l* 17·08 *l* 17·38 *l* 18·02	*l* 17·18 *l* 14·70 *l* 16·50 *l* 17·36	*l* 17·36 *l* 17·24 *l* 17·56	*l* 20·20 *l* 18·62 *l* 18·38	$M = 17''·51$ $w = 13·83$ $\frac{1}{w} = 0·07$
	17·14	17·17	17·80	17·50	18·07	17·03	17·49	16·44	17·39	19·07	$C = 69° 22′ 17''·51$

At XXXIII (Nagari)

***March* 1865; *observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XXXV (Chĕmbedu) 130° 13′	310° 12′	209° 24′	29° 24′	288° 36′	108° 36′	7° 49′	187° 49′	87° 1′	267° 1′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXV (Chĕmbedu) and XXXII (Kurumkota)	″ *h* 56·78 *h* 55·30 *h* 54·92	″ *h* 54·88 *h* 56·00 *d* 53·97	″ *l* 53·14 *l* 53·22 *l* 52·76	″ *l* 55·78 *l* 55·64 *l* 55·62	″ *l* 52·94 *l* 55·70 *l* 54·96	″ *l* 55·10 *l* 55·46 *h* 57·92	″ *l* 54·32 *l* 53·18 *l* 52·72 *l* 53·56	″ *l* 55·30 *l* 54·44 *h* 56·68	″ *h* 54·84 *h* 54·38 *h* 54·88 *h* 54·68	″ *h* 57·90 *h* 56·34 *h* 55·52	$M = 55''·02$ $w = 6·74$ $\frac{1}{w} = 0·15$
	55·67	54·95	53·04	55·68	54·53	56·16	53·45	55·47	54·70	56·59	$C = 48° 6′ 55''·01$
XXXII (Kurumkota) and XXX (Pullúr)	*h* 10·20 *h* 10·78 *h* 10·58	*h* 10·50 *h* 11·00 *d* 9·28	*l* 9·70 *l* 8·94 *l* 11·86	*l* 7·40 *l* 10·08 *l* 9·46	*l* 9·54 *l* 7·78 *l* 8·68	*h* 9·00 *h* 9·42 *h* 9·28	*l* 9·12 *l* 10·28 *l* 11·46	*l* 8·08 *l* 9·06 *h* 10·56	*h* 10·34 *h* 9·22 *l* 10·14	*l* 12·02 *l* 11·44 *h* 8·74 *h* 10·66	$M = 9''·80$ $w = 12·91$ $\frac{1}{w} = 0·08$
	10·52	10·26	10·17	8·98	8·67	9·23	10·29	9·23	9·90	10·72	$C = 82° 5′ 9''·81$

At XXXIV (Mávandúr)

****April* 1865 *and* †*January* 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.**

Angle between	Circle readings, telescope being set on XXXI (Anandalamalai) 118° 12′	298° 11′	197° 24′	17° 24′	276° 36′	96° 36′	355° 48′	175° 48′	75° 0′	255° 0′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* XXXI (Anandalamalai) and XXXII (Kurumkota)	″ *l* 53·64 *l* 54·52	″ *l* 52·94 *l* 53·40 *l* 53·80	″ *l* 52·90 *l* 52·58 *l* 53·34	″ *l* 52·90 *l* 53·40 *l* 52·28	″ *l* 52·66 *l* 53·88 *l* 53·24	″ *l* 53·38 *l* 52·56 *l* 53·12	″ *l* 53·06 *l* 52·70 *l* 53·48	″ *l* 52·60 *l* 53·24 *l* 51·10	″ *l* 52·78 *l* 53·20 *l* 53·14	″ *l* 52·96 *l* 52·02 *l* 51·80	$M = 53''·02$ $w = 28·30$ $\frac{1}{w} = 0·04$
	54·08	53·38	52·94	52·86	53·26	53·02	53·08	52·31	53·04	52·26	$C = 69° 36′ 53''·01$

At XXXIV (Mávandúr)—(*Continued*).

Circle readings, telescope being set on XXXI (Anandalamalai)

Angle between	118° 12′	298° 11′	197° 24′	17° 24′	276° 36′	96° 36′	355° 48′	175° 48′	75° 0′	255° 0′	M = Mean of Groups w = Relative Weight C = Concluded Angle
* XXXII (Kurumkota) and XXXVI (Malaipedu)	″ h 10·62 h 10·94 l 10·30 l 9·54	″ l 10·66 l 10·88 l 10·94	″ l 11·12 l 10·96 l 10·62	″ l 10·08 l 9·44 l 11·12	″ l 10·00 l 10·54 l 11·08	″ l 10·74 l 11·18 l 10·72	″ l 10·34 l 10·42 l 10·86	″ l 10·98 l 11·12 l 11·56	″ l 10·58 l 10·78 l 10·82	″ l 11·42 l 10·96 l 11·68	$M = 10''\cdot76$ $w = 59\cdot17$ $\frac{1}{w} = 0\cdot02$
	10·35	10·83	10·90	10·21	10·54	10·88	10·54	11·22	10·73	11·35	$C = 48° 34' 10''\cdot76$
† XXXVI (Malaipedu) and XXXVIII (Tirumani)	l 52·81 l 54·00 l 53·51	l 56·50 l 54·88 l 55·51	h 53·31 h 54·03 h 53·32	l 56·78 l 55·59 l 55·82	l 52·89 l 53·24 l 51·97	l 54·77 l 54·86 l 56·31	h 53·75 h 54·97 h 54·91	l 55·14 l 55·92 l 52·68	l 52·30 l 54·68 l 52·66	l 53·40 l 54·15 l 54·63	$M = 54''\cdot31$ $w = 7\cdot00$ $\frac{1}{w} = 0\cdot14$
	53·44	55·63	53·55	56·06	52·70	55·31	54·54	54·58	53·21	54·06	$C = 43° 13' 54''\cdot31$
† XXXVIII (Tirumani) and XXXIX (Avirimodu)	l 49·02 l 49·32 l 49·04	l 47·44 l 49·20 l 46·97	h 49·25 h 49·00 h 48·87	l 47·26 l 46·61 l 46·52	l 48·26 l 47·44 l 47·14	l 47·61 l 48·57 l 48·28	h 48·47 h 47·92 h 48·01	l 46·53 l 46·22 l 48·95	l 49·97 l 48·36 l 49·34	l 48·85 l 48·86 l 47·82	$M = 48''\cdot17$ $w = 12\cdot50$ $\frac{1}{w} = 0\cdot08$
	49·13	47·87	49·04	46·80	47·61	48·15	48·13	47·23	49·22	48·51	$C = 33° 38' 48''\cdot17$

At XXXV (Chĕmbedu)

May 1865; *observed by Captain B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Circle readings, telescope being set on XXXVII (Madras Dome Observatory)

Angle between	280° 43′	100° 43′	359° 55′	179° 55′	79° 8′	259° 7′	158° 20′	338° 20′	237° 32′	57° 32′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XXXVII (Madras Dome Oby.) and XXXVI (Malaipedu)	″ l 51·90 l 55·66 l 55·58 l 53·64	″ l 57·18 l 55·04 l 55·90 l 54·70	″ l 55·48 l 56·18 l 55·72	″ l 56·32 l 58·52 l 55·22 l 56·76 l 55·20	″ l 53·58 l 54·14 l 58·12 l 57·14	″ l 57·10 d 54·38 d 54·44	″ l 55·54 l 56·40 l 55·50 d 52·12 d 54·30 d 52·46	″ l 57·86 l 57·68 l 58·48 d 49·20 d 52·20 d 54·46 d 54·36	″ d 55·29 d 55·31 d 56·61	″ l 56·52 l 56·12 d 59·98 d 57·86 d 56·08	$M = 55''\cdot55$ $w = 6\cdot21$ $\frac{1}{w} = 0\cdot16$ $C = 48° 30' 55''\cdot54$
	54·20	55·70	55·79	56·40	55·75	55·31	54·39	54·89	55·74	57·31	
XXXVI (Malaipedu) and XXXII (Kurumkota)	l 39·18 l 39·28 l 39·28	l 39·54 l 39·80 l 39·74	l 39·84 l 41·62 l 39·94	l 39·08 l 40·08 l 39·30	l 39·32 l 40·40 l 40·40	l 41·20 l 40·00 l 39·46	l 39·32 l 40·90 l 41·76	l 42·28 h 40·16 l 40·26	l 41·06 l 40·46 l 39·92 l 39·00	l 38·26 l 38·60 l 38·70 l 39·80	$M = 39''\cdot97$ $w = 17\cdot46$ $\frac{1}{w} = 0\cdot06$
	39·25	39·69	40·47	39·49	40·04	40·22	40·66	40·90	40·11	38·84	$C = 52° 36' 39''\cdot96$

At XXXV (Chĕmbedu)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXVII (Madras Dome Observatory)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	280° 43′	100° 43′	359° 55′	179° 55′	79° 8′	259° 7′	158° 20′	338° 20′	237° 32′	57° 32′	
XXXII (Kurumkota) and XXXIII (Nagari)	″ *l* 57·12 *l* 55·52 *l* 55·22	″ *l* 55·20 *l* 54·94 *l* 55·54	″ *l* 54·52 *l* 55·00 *l* 55·84	″ *l* 54·84 *l* 55·20 *l* 54·82	″ *l* 56·98 *l* 54·62 *l* 55·32	″ *l* 54·68 *l* 54·04 *l* 54·70	″ *l* 55·36 *l* 55·16 *l* 56·44	″ *l* 53·52 *h* 53·34 *l* 53·80	″ *l* 55·92 *l* 58·72 *l* 55·80 *l* 56·32	″ *l* 57·94 *l* 55·14 *l* 55·52	$M = 55''\cdot35$ $w = 9\cdot95$ $\frac{1}{w} = 0\cdot10$
	55·95	55·23	55·12	54·95	55·64	54·47	55·65	53·55	56·69	56·20	$C = 61^\circ 25' 55''\cdot36$

At XXXVI (Malaipedu)

******May* 1865 *and* †*February* 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIII (Mángád)										M = Mean of Groups w = Relative Weight C = Concluded Angle
	0° 1′	180° 1′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	
† XLIII (Mángád) and XLII (Nanmangalam)	″ *h* 17·23 *h* 17·56 *h* 17·33	″ *h* 17·86 *h* 18·09 *l* 18·19	″ *l* 16·25 *l* 16·07 *l* 15·94	″ *l* 18·78 *l* 17·18 *l* 18·00	″ *h* 17·19 *h* 15·75 *h* 15·20	″ *h* 17·47 *h* 17·62 *h* 18·05	″ *l* 17·08 *l* 17·99 *l* 17·62	″ *l* 18·18 *l* 18·50 *l* 18·29	″ *h* 18·65 *h* 17·17 *h* 18·28	″ *h* 17·28 *h* 17·01 *h* 17·04	$M = 17''\cdot43$ $w = 14\cdot30$ $\frac{1}{w} = 0\cdot07$
	17·37	18·05	16·09	17·99	16·05	17·71	17·56	18·32	18·03	17·11	$C = 43^\circ 46' 17''\cdot43$
† XLII (Nanmangalam) and XLI (Pudupák)	*h* 11·48 *h* 12·25 *h* 12·12	*h* 11·64 *h* 10·79 *l* 12·49	*l* 13·29 *l* 11·85 *l* 11·43	*l* 10·70 *l* 11·06 *l* 10·03	*h* 11·79 *h* 12·66 *h* 12·92	*h* 11·63 *h* 11·46 *h* 11·29	*l* 12·78 *l* 12·43 *l* 11·93	*l* 10·91 *l* 9·94 *l* 9·95	*h* 11·18 *h* 11·79 *h* 11·13	*h* 12·14 *h* 12·60 *h* 11·17	$M = 11''\cdot63$ $w = 23\cdot80$ $\frac{1}{w} = 0\cdot04$
	11·95	11·64	12·19	10·60	12·46	11·46	12·38	10·27	11·37	11·97	$C = 35^\circ 44' 11''\cdot63$
† XLI (Pudupák) and XXXVIII (Tirumani)	*h* 57·16 *h* 57·47 *h* 57·22	*h* 56·22 *h* 56·61 *l* 55·92	*l* 56·97 *l* 57·89 *l* 58·16	*l* 56·02 *l* 56·57 *l* 57·29	*h* 57·50 *h* 57·87 *h* 57·93	*h* 56·58 *h* 57·43 *h* 56·80	*l* 55·98 *l* 56·05 *l* 56·39	*l* 57·12 *l* 58·56 *l* 57·86	*h* 56·74 *h* 57·41 *h* 57·74	*h* 57·12 *h* 57·27 *h* 57·88	$M = 57''\cdot13$ $w = 23\cdot30$ $\frac{1}{w} = 0\cdot04$
	57·28	56·25	57·67	56·63	57·77	56·94	56·14	57·85	57·30	57·42	$C = 65^\circ 39' 57''\cdot13$
† XXXVIII (Tirumani) and XXXIV (Mávandúr)	*h* 20·09 *h* 20·73 *h* 21·40	*h* 20·46 *h* 20·61 *l* 20·62	*l* 20·09 *l* 22·03 *l* 21·28	*l* 22·12 *l* 21·62 *l* 22·03	*h* 19·65 *h* 20·05 *h* 19·99	*h* 21·32 *h* 20·97 *h* 20·34	*l* 20·06 *l* 21·17 *l* 20·83	*l* 21·70 *l* 20·47 *l* 19·54	*h* 20·69 *h* 20·85 *h* 20·64	*h* 20·60 *h* 19·89 *h* 20·46	$M = 20''\cdot74$ $w = 27\cdot80$ $\frac{1}{w} = 0\cdot04$
	20·74	20·56	21·13	21·92	19·90	20·88	20·69	20·57	20·73	20·32	$C = 56^\circ 19' 20''\cdot74$

At XXXVI (Malaipedu)—(*Continued*).

Angle between	Circle readings, telescope being set on XXXIV (Mávandúr) 179° 35′	359° 35′	258° 47′	78° 47′	337° 59′	157° 59′	57° 11′	237° 11′	136° 23′	316° 23′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
* XXXIV (Mávandúr) and XXXII (Kurumkota)	″ *l* 63·48	″ *l* 60·40	″ *l* 61·24	″ *l* 61·20	″ *l* 60·46	″ *l* 59·14	″ *l* 60·96	″ *l* 61·46	″ *l* 61·68	″ *l* 60·74	$M = 60''\cdot74$
	l 61·36	*l* 60·76	*l* 62·06	*l* 60·06	*l* 60·74	*l* 60·30	*l* 60·80	*l* 60·40	*l* 60·16	*l* 60·54	$w = 18\cdot42$
	l 60·96	*l* 60·40	*l* 62·86	*l* 60·58	*l* 60·04	*l* 59·76	*l* 61·36	*l* 61·04	*l* 59·42	*l* 59·98	$\frac{1}{w} = 0\cdot05$
	l 59·48										
	l 60·96										
	61·25	60·52	62·05	60·61	60·41	59·73	61·04	60·97	60·42	60·42	$C = 52^\circ\ 39'\ 0''\cdot75$
* XXXII (Kurumkota) and XXXV (Chĕmbedu)	*l* 4·88	*l* 5·78	*l* 6·14	*l* 5·76	*l* 4·84	*l* 5·92	*l* 4·24	*l* 4·78	*l* 4·74	*l* 4·90	$M = 5''\cdot39$
	l 4·58	*l* 5·14	*l* 4·86	*l* 5·66	*l* 6·34	*l* 5·06	*l* 5·54	*l* 4·84	*l* 5·20	*l* 6·94	$w = 43\cdot50$
	l 6·14	*l* 5·44	*l* 4·66	*l* 5·46	*l* 5·60	*l* 6·28	*l* 4·84	*l* 4·90	*l* 6·22	*l* 5·96	$\frac{1}{w} = 0\cdot02$
	5·20	5·45	5·22	5·63	5·59	5·75	4·87	4·84	5·39	5·93	$C = 58^\circ\ 1'\ 5''\cdot39$
* XXXV (Chĕmbedu) and XXXVII (Madras Dome Observatory)	*l* 20·72	*l* 19·90	*l* 19·86	*l* 20·70	*l* 20·22	*l* 20·54	*l* 21·20	*l* 21·36	*l* 19·92	*l* 20·60	$M = 20''\cdot38$
	l 20·96	*l* 20·18	*l* 20·50	*l* 19·80	*l* 20·18	*l* 20·98	*l* 21·04	*l* 20·50	*l* 19·86	*l* 18·52	$w = 29\cdot40$
	l 19·56	*l* 20·94	*l* 21·02	*l* 20·76	*l* 18·96	*l* 19·76	*l* 21·64	*l* 21·24	*l* 19·70	*l* 20·20	$\frac{1}{w} = 0\cdot03$
	20·41	20·34	20·46	20·42	19·79	20·43	21·29	21·03	19·83	19·77	$C = 62^\circ\ 2'\ 20''\cdot38$

At XXXVII (Madras Dome Observatory)

June 1865; *observed by Captain B. R. Branfill with Troughton and Simms*' 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXVI (Malaipedu) 343° 9′	163° 9′	62° 22′	242° 22′	141° 34′	321° 34′	220° 46′	40° 46′	299° 58′	119° 58′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXXVI (Malaipedu) and XXXV (Chĕmbedu)	″ *l* 47·52	″ *l* 49·48	″ *l* 48·88	″ *l* 47·68	″ *l* 45·88	″ *l* 44·02	″ *l* 45·82	″ *l* 47·76	″ *l* 47·52	″ *h* 46·94	$M = 47''\cdot07$
	l 49·06	*l* 47·04	*l* 46·46	*l* 47·78	*l* 47·86	*l* 46·12	*l* 44·88	*l* 48·20	*l* 47·22	*h* 46·62	$w = 10\cdot11$
	l 47·46	*l* 45·86	*l* 46·20	*l* 46·90	*l* 47·98	*l* 45·66	*l* 47·16	*l* 46·88	*h* 47·84	*h* 49·18	$\frac{1}{w} = 0\cdot10$
		l 45·20							*h* 47·18	*h* 47·76	
	48·01	46·90	47·18	47·45	47·24	45·27	45·95	47·61	47·44	47·62	$C = 69^\circ\ 26'\ 47''\cdot08$

At XXXVIII (Tirumani)

January 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms*' 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIX (Avirimodu) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
XXXIX (Avirimodu) and XXXIV (Mávandúr)	″ *h* 35·39	″ *h* 37·27	″ *l* 35·15	″ *l* 36·49	″ *h* 34·01	″ *h* 36·56	″ *l* 35·99	″ *l* 36·85	″ *l* 36·75	″ *h* 33·93	$M = 35''\cdot80$
	h 34·95	*h* 36·36	*l* 36·12	*l* 36·62	*h* 35·47	*h* 36·36	*l* 36·43	*l* 36·94	*h* 35·05	*h* 34·56	$w = 13\cdot34$
	h 34·83	*l* 36·60	*l* 35·82	*l* 35·53	*h* 35·28	*h* 36·21	*l* 36·14	*l* 36·29	*h* 35·85	*h* 34·11	$\frac{1}{w} = 0\cdot07$
			l 35·69								
	35·06	36·74	35·70	36·21	34·92	36·38	36·19	36·69	35·88	34·20	$C = 87^\circ\ 39'\ 35''\cdot80$

At XXXVIII (Tirumani)—(*Continued*).

Angle between	0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXIV (Mávandúr) and XXXVI (Malaipedu)	h 47·57	h 47·62	l 47·19	l 47·16	h 48·19	h 46·76	l 46·66	l 47·54	l 46·74	h 47·93	$M = 47''\cdot60$
	h 47·89	h 47·92	l 46·66	l 47·37	h 47·70	h 47·42	l 47·58	l 48·00	h 48·03	h 47·78	$w = 47\cdot84$
	h 48·61	l 48·21	l 46·68	l 48·81	h 47·59	h 47·30	l 47·12	l 48·36	h 47·74	h 47·62	$\frac{1}{w} = 0\cdot02$
			l 47·15								
	48·02	47·92	46·92	47·78	47·83	47·16	47·12	47·97	47·50	47·78	$C = 80^\circ 26' 47''\cdot60$
XXXVI (Malaipedu) and XLI (Pudupák)	h 42·17	h 40·42	l 42·69	l 40·97	h 41·58	h 41·71	l 42·04	l 41·81	l 42·25	h 43·10	$M = 41''\cdot87$
	h 42·35	h 40·86	l 42·44	l 41·61	h 41·74	h 42·01	l 40·96	l 42·52	h 40·42	h 43·39	$w = 20\cdot00$
	h 41·84	l 41·03	l 42·52	l 41·01	h 42·07	h 41·32	l 41·90	l 42·27	h 42·09	h 42·83	$\frac{1}{w} = 0\cdot05$
	42·12	40·77	42·55	41·20	41·80	41·68	41·63	42·20	41·59	43·11	$C = 45^\circ 45' 41''\cdot87$
XLI (Pudupák) and XL (Manamai Kunnatúr)	h 3·13	h 3·24	l 2·05	l 2·80	h 1·81	h 4·04	l 2·16	l 2·28	l 1·21	h 2·42	$M = 2''\cdot59$
	h 2·98	h 3·01	l 3·23	l 2·15	h 2·22	h 3·77	l 2·75	l 1·85	h 3·95	h 2·09	$w = 40\cdot00$
	h 2·81	l 3·06	l 1·89	l 3·11	h 2·36	h 3·88	l 2·15	l 1·48	h 1·61	h 2·31	$\frac{1}{w} = 0\cdot03$
	2·97	3·10	2·39	2·69	2·13	3·90	2·35	1·87	2·26	2·27	$C = 60^\circ 25'\ 2''\cdot59$
XL (Manamai Kunnatúr) and XXXIX (Avirimodu)	h 52·06	h 51·88	l 53·19	l 52·46	h 53·68	h 50·79	l 52·70	l 51·94	l 52·96	h 52·89	$M = 52''\cdot34$
	h 50·90	h 51·55	l 51·95	l 52·65	h 53·27	h 51·35	l 52·44	l 51·02	h 53·93	h 53·01	$w = 13\cdot20$
	h 52·29	l 50·71	l 51·89	l 52·26	h 53·28	h 51·19	l 52·36	l 52·36	h 53·82	h 53·30	$\frac{1}{w} = 0\cdot08$
	51·75	51·38	52·34	52·46	53·41	51·11	52·50	51·77	53·57	53·07	$C = 85^\circ 42' 52''\cdot34$

Circle readings, telescope being set on XXXIX (Avirimodu).

At XXXIX (Avirimodu)

January 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	103° 55′	283° 56′	183° 7′	3° 7′	262° 19′	82° 19′	341° 31′	161° 32′	60° 43′	240° 44′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	
XXXIV (Mávandúr) and XXXVIII (Tirumani)	h 38·67	h 38·44	l 37·59	l 37·01	h 40·05	h 37·26	l 38·55	l 37·40	h 37·50	h 36·75	$M = 38''\cdot04$
	h 37·74	l 38·24	l 37·37	l 38·94	h 41·08	h 38·44	l 38·59	l 36·89	h 38·72	h 36·17	$w = 10\cdot20$
	h 38·65	l 37·81	l 37·05	l 38·38	h 39·57	h 37·65	l 38·42	l 37·43	h 37·83	h 37·14	$\frac{1}{w} = 0\cdot10$
	38·35	38·16	37·34	38·11	40·23	37·78	38·52	37·24	38·02	36·69	$C = 58^\circ 41' 38''\cdot04$
XXXVIII (Tirumani) and XL (Manamai Kunnatúr)	h 53·36	h 52·64	l 54·94	l 53·29	h 53·93	h 53·78	l 54·67	l 54·16	h 53·48	h 54·87	$M = 53''\cdot90$
	h 53·75	l 53·10	l 54·68	l 52·89	h 53·29	h 53·24	l 54·56	l 53·91	h 53·46	h 55·54	$w = 22\cdot20$
	h 54·36	l 53·75	l 54·72	l 53·67	h 54·09	h 52·75	l 54·72	l 54·20	h 53·47	h 53·86	$\frac{1}{w} = 0\cdot05$
	53·82	53·16	54·78	53·28	53·77	53·26	54·65	54·09	53·47	54·76	$C = 45^\circ 12' 53''\cdot90$

Circle readings, telescope being set on XXXIV (Mávandúr).

At XL (Manamai Kunnatúr)

January 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XXXIX (Avirimodu) 122° 17′	302° 17′	201° 29′	21° 29′	280° 41′	100° 41′	359° 53′	179° 54′	79° 5′	259° 6′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	$M = 15''\cdot31$
XXXIX (Avirimodu)	h 16·73	h 14·15	l 14·24	l 15·07	l 15·21	l 14·90	h 15·23	h 15·89	l 14·19	l 15·30	
and	h 15·79	h 15·89	l 15·94	l 15·50	l 16·11	h 14·13	h 14·64	h 17·09	l 14·58	l 15·77	$w = 18\cdot50$
XXXVIII (Tirumani)	h 16·41	h 15·44	l 13·97	l 14·70	l 16·13	h 16·23	h 14·57	h 15·36	l 13·97	l 16·01	$\frac{1}{w} = 0\cdot05$
	16·31	15·16	14·72	15·09	15·82	15·09	14·81	16·11	14·25	15·69	$C = 49°\ 4'\ 15''\cdot31$
XXXVIII (Tirumani)	h 16·34	h 16·20	l 16·11	l 17·55	l 16·55	l 16·61	h 14·70	h 15·41	l 16·50	l 16·49	$M = 16''\cdot37$
and	h 16·34	h 16·24	l 16·62	l 17·31	l 15·69	h 16·64	h 15·78	h 15·99	l 16·80	l 16·39	$w = 33\cdot30$
XLI (Pudupák)	h 15·33	h 16·73	l 17·02	l 17·11	l 16·81	h 16·15	h 15·75	h 16·34	l 16·62	l 16·85	$\frac{1}{w} = 0\cdot03$
	16·00	16·39	16·58	17·32	16·35	16·47	15·41	15·91	16·64	16·58	$C = 73°\ 12'\ 16''\cdot37$

At XLI (Pudupák)

January 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XL (Manamai Kunnatúr) 0° 1′	180° 1′	79° 13′	259° 13′	158° 25′	338° 25′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups; w = Relative Weight; C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	$M = 42''\cdot18$
XL (Manamai Kunnatúr)	h 42·42	h 43·58	l 40·67	l 42·34	h 40·54	l 42·55	l 43·63	l 42·36	h 41·71	l 41·47	
and	h 41·67	h 43·46	l 41·35	l 42·37	h 40·74	l 42·17	l 42·09	h 42·29	l 41·94	l 42·47	$w = 16\cdot40$
XXXVIII (Tirumani)	h 42·42	l 43·11	l 41·99	l 42·86	h 40·75	l 43·05	l 42·13	h 42·68	l 41·84	l 42·71	$\frac{1}{w} = 0\cdot06$
	42·17	43·38	41·34	42·52	40·68	42·59	42·62	42·44	41·83	42·22	$C = 46°\ 22'\ 42''\cdot18$
XXXVIII (Tirumani)	h 23·50	h 23·11	l 22·78	l 22·72	h 22·93	l 22·84	l 21·58	l 23·51	h 24·08	l 22·77	$M = 23''\cdot02$
and	h 23·14	h 22·64	l 22·94	l 22·25	h 23·36	l 22·90	l 23·25	l 23·57	l 23·57	l 22·71	$w = 47\cdot60$
XXXVI (Malaipedu)	h 22·85	l 23·42	l 22·32	l 22·84	h 23·67	l 23·48	l 23·42	h 21·65	l 23·93	l 22·85	$\frac{1}{w} = 0\cdot02$
	23·16	23·06	22·68	22·60	23·32	23·07	22·75	22·91	23·86	22·78	$C = 68°\ 34'\ 23''\cdot02$
XXXVI (Malaipedu)	h 43·20	h 44·33	l 44·29	l 44·88	h 44·47	h 43·05	l 44·41	l 44·31	h 44·15	l 43·52	$M = 44''\cdot10$
and	h 44·30	h 44·87	l 44·28	l 44·27	h 44·45	l 43·53	l 44·42	l 44·16	l 43·79	l 43·73	$w = 43\cdot50$
XLII (Nanmangalam)	h 43·82	l 44·79	l 45·07	l 43·72	h 43·88	l 43·92	l 44·62	h 44·38	l 43·62	l 42·92	$\frac{1}{w} = 0\cdot02$
	43·77	44·66	44·55	44·29	44·27	43·50	44·48	44·28	43·85	43·39	$C = 51°\ 30'\ 44''\cdot10$
XLII (Nanmangalam)	h 21·91	h 20·43	l 22·70	l 21·76	h 21·95	h 21·75	l 21·15	l 21·98	h 20·48	l 22·21	$M = 21''\cdot44$
and	h 22·07	h 21·21	l 21·18	l 21·68	h 19·72	l 21·93	l 21·37	l 20·23	l 20·77	l 22·29	$w = 23\cdot80$
XLV (Injambákam)	h 22·10	l 19·89	l 21·17	l 21·66	h 21·81	l 20·36	l 20·91	h 22·43	l 21·40	l 22·54	$\frac{1}{w} = 0\cdot04$
	22·03	20·51	21·68	21·70	21·16	21·35	21·14	21·55	20·88	22·35	$C = 36°\ 20'\ 21''\cdot44$

At XLII (Nanmangalam)

February 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIV (St. Thomas's Mount) 0°1′	180°1′	79°13′	259°13′	158°25′	338°25′	237°37′	57°37′	316°49′	136°49′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	$M = 47''\cdot91$
XLIV (St. Thomas's Mount)	h 48·24	h 47·55	l 47·49	l 47·49	h 47·26	h 48·16	l 48·16	l 47·19	h 49·87	l 47·38	$w = 24\cdot40$
and	h 47·77	h 48·20	l 47·13	l 47·33	h 48·29	l 47·05	l 47·62	h 49·90	h 49·14	l 47·08	$\frac{1}{w} = 0\cdot04$
XLV (Injambákam)	h 47·54	l 47·77	l 47·51	l 48·06	h 47·87	l 47·79	l 47·47	h 48·89	h 48·54	l 47·51	
	47·85	47·84	47·38	47·63	47·81	47·67	47·75	48·66	49·18	47·32	$C = 86°\ 33'\ 47''\cdot91$
XLV (Injambákam)	h 34·65	h 35·84	l 35·42	l 35·33	h 34·69	h 35·58	l 35·33	l 34·89	h 33·12	l 34·90	$M = 34''\cdot92$
and	h 34·52	h 35·05	l 35·03	l 35·60	h 35·17	l 35·30	l 35·41	h 34·01	h 34·60	l 34·45	$w = 41\cdot70$
XLI (Pudupák)	h 34·65	l 34·73	l 35·43	l 35·37	h 34·76	l 35·28	l 34·98	h 34·52	h 34·82	l 34·25	$\frac{1}{w} = 0\cdot02$
	34·61	35·21	35·29	35·43	34·87	35·39	35·24	34·47	34·18	34·53	$C = 73°\ 59'\ 34''\cdot92$
XLI (Pudupák)	h 4·02	h 5·04	l 4·27	l 4·98	h 5·20	h 5·54	l 3·94	l 4·87	h 6·64	l 5·22	$M = 4''\cdot98$
and	h 3·72	h 5·40	l 4·67	l 4·81	h 4·93	l 5·62	l 3·98	h 5·33	h 5·32	l 5·71	$w = 21\cdot70$
XXXVI (Malaipedu)	h 5·34	l 4·95	l 3·89	l 4·94	h 5·36	l 5·42	l 3·50	h 6·44	h 4·52	l 5·65	$\frac{1}{w} = 0\cdot05$
	4·36	5·13	4·28	4·91	5·16	5·53	3·81	5·55	5·49	5·53	$C = 92°\ 45'\ 4''\cdot98$
XXXVI (Malaipedu)	h 49·35	h 48·01	l 49·88	l 49·36	h 51·12	h 48·70	l 49·20	l 48·52	h 49·25	l 49·26	$M = 49''\cdot27$
and	h 50·10	h 48·95	l 49·75	l 49·45	h 50·29	l 48·86	l 50·11	h 48·56	h 48·55	l 48·71	$w = 20\cdot40$
XLIII (Mángád)	h 48·32	l 49·47	l 50·14	l 48·82	h 50·16	l 48·73	l 50·15	h 47·62	h 49·24	l 49·47	$\frac{1}{w} = 0\cdot05$
	49·26	48·81	49·92	49·21	50·52	48·76	49·82	48·23	49·01	49·15	$C = 50°\ 52'\ 49''\cdot27$
XLIII (Mángád)	h 43·83	h 43·65	l 43·20	l 42·69	h 41·41	h 41·42	l 43·85	l 43·70	h 41·45	l 43·03	$M = 42''\cdot83$
and	h 43·82	h 42·58	l 43·37	l 42·30	h 41·39	l 43·33	l 42·24	h 41·51	h 42·05	l 43·85	$w = 20\cdot40$
XLIV (St. Thomas's Mount)	h 43·62	l 42·14	l 42·98	l 43·24	h 42·71	l 43·10	l 44·33	h 42·99	h 42·53	l 42·57	$\frac{1}{w} = 0\cdot05$
	43·76	42·79	43·18	42·74	41·84	42·62	43·47	42·73	42·01	43·15	$C = 55°\ 48'\ 42''\cdot83$

At XLIII (Mángád)

February 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLIV (St. Thomas's Mount) 130°21′	310°21′	209°33′	29°33′	288°45′	108°45′	7°57′	187°57′	87°9′	267°9′	M = Mean of Groups, w = Relative Weight, C = Concluded Angle
	″	″	″	″	″	″	″	″	″	″	$M = 17''\cdot56$
XLIV (St. Thomas's Mount)	h 18·65	h 17·55	h 17·65	h 17·55	l 17·36	l 17·83	h 16·31	h 17·29	h 15·72	l 17·66	$w = 22\cdot70$
and	h 18·86	h 17·76	h 16·81	l 18·43	l 18·03	l 17·45	h 17·53	h 18·58	h 16·29	l 17·72	$\frac{1}{w} = 0\cdot04$
XLII (Nanmangalam)	h 17·97	h 17·34	h 17·34	l 18·38	l 16·54	l 18·31	h 17·76	h 17·40	l 16·75	l 18·00	
	18·49	17·55	17·27	18·12	17·31	17·86	17·20	17·76	16·25	17·79	$C = 44°\ 59'\ 17''\cdot56$

At XLIII (Mángád)—(*Continued*).

Angle between	Circle readings, telescope being set on XLIV (St. Thomas's Mount) 130° 21′	310° 21′	209° 33′	29° 33′	288° 45′	108° 45′	7° 57′	187° 57′	87° 9′	267° 9′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLII (Nanmangalam) and XXXVI (Malaipedu)	″ h 54·37 h 54·51 h 53·70	″ h 54·58 h 53·77 h 54·05	″ h 54·52 h 54·43 h 54·85	″ h 54·71 l 54·11 l 53·67	″ l 54·60 l 54·43 l 54·61	″ l 52·61 l 53·56 l 52·78	″ h 55·07 h 54·47 h 54·65	″ h 55·17 h 54·29 h 54·87	″ h 55·15 h 55·44 l 54·38	″ l 53·55 l 53·28 l 53·72	$M = 54''\cdot26$ $w = 23\cdot80$ $\frac{1}{w} = 0\cdot04$
	54·19	54·13	54·60	54·16	54·55	52·98	54·73	54·78	54·99	53·52	$C = 85^\circ\ 20'\ 54''\cdot26$

At XLIV (St. Thomas's Mount)

February 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLV (Injambákam) 0° 1′	180° 0′	79° 13′	259° 13′	158° 24′	338° 24′	237° 37′	57° 37′	316° 49′	136° 49′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLV (Injambákam) and XLII (Nanmangalam)	″ l 54·83 l 52·89 l 54·50	″ l 54·74 l 55·04 l 53·92	″ h 54·16 h 53·72 h 54·20	″ h 55·25 h 53·14 l 54·03	″ l 53·54 l 52·58 l 52·86	″ l 54·59 l 54·84 l 53·94	″ h 53·35 h 53·86 h 54·37	″ h 55·48 h 54·31 l 53·72 l 53·97	″ h 55·31 h 54·79 h 54·99	″ h 53·87 h 53·92 h 54·14	$M = 54''\cdot15$ $w = 25\cdot82$ $\frac{1}{w} = 0\cdot04$
	54·07	54·57	54·03	54·14	52·99	54·46	53·86	54·37	55·03	53·98	$C = 44^\circ\ 57'\ 54''\cdot15$
XLII (Nanmangalam) and XLIII (Mángád)	l 60·21 l 59·24 l 59·02	l 57·69 l 58·01 l 58·03	h 58·77 h 59·33 h 58·64	h 59·37 h 58·83 l 58·91	l 58·51 l 58·42 l 58·97	l 59·60 l 59·59 l 59·04	h 58·72 h 58·25 h 58·02	h 59·49 h 58·60 l 58·98	h 58·37 h 58·71 h 58·86	h 58·76 h 58·76 h 58·12	$M = 58''\cdot79$ $w = 38\cdot50$ $\frac{1}{w} = 0\cdot03$
	59·49	57·91	58·91	59·04	58·63	59·41	58·33	59·02	58·65	58·55	$C = 79^\circ\ 11'\ 58''\cdot79$

At XLV (Injambákam)

February 1880; *observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms'* 24-*inch Theodolite No.* 1.

Angle between	Circle readings, telescope being set on XLI (Pudupák) 118° 9′	298° 9′	197° 21′	17° 21′	276° 33′	96° 33′	355° 45′	175° 45′	74° 57′	254° 57′	M = Mean of Groups w = Relative Weight C = Concluded Angle
XLI (Pudupák) and XLII (Nanmangalam)	″ h 4·46 h 4·17 h 3·83	″ h 4·33 l 4·32 l 4·61	″ h 4·36 l 3·37 l 3·60	″ l 3·30 l 4·34 l 3·08	″ h 4·61 h 3·93 l 3·75	″ l 3·87 l 4·47 l 3·63	″ h 3·04 h 3·54 h 3·61	″ h 4·09 l 3·41 l 3·74	″ h 4·29 h 4·23 l 3·99	″ h 3·92 h 4·65 h 4·02	$M = 3''\cdot95$ $w = 71\cdot40$ $\frac{1}{w} = 0\cdot01$
	4·15	4·42	3·78	3·57	4·10	3·99	3·40	3·75	4·17	4·20	$C = 69^\circ\ 40'\ 3''\cdot95$
XLII (Nanmangalam) and XLIV (St. Thomas's Mount)	h 18·30 h 19·38 h 19·09	h 17·18 l 17·23 l 17·20	h 18·75 l 19·15 l 18·90	l 18·72 l 18·66 l 18·58	h 18·73 h 19·36 l 18·53	l 18·34 l 18·68 l 18·18	h 18·94 h 18·90 h 18·93	h 19·59 l 18·74 l 18·62	h 17·24 h 17·71 h 18·36 l 17·84	h 19·70 h 18·58 h 19·07	$M = 18''\cdot58$ $w = 24\cdot40$ $\frac{1}{w} = 0\cdot04$
	18·92	17·20	18·93	18·65	18·87	18·40	18·92	18·98	17·79	19·12	$C = 48^\circ\ 28'\ 18''\cdot58$

August, 1887.

W. H. COLE,
In charge of Computing Office.

In the calculations of the weights of the observed angles by the formula given in Section 4 of Chapter VII of Volume II and illustrated by an example in the foot note to page 342 of the same Volume, it is necessary to employ the squares of the *apparent* errors of observation and graduation. These data have been employed to 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 as follows :—

Troughton and Simms' 24-inch Theodolite No. 1 and Barrow's 24-inch Theodolite No. 1, each having 5 microscopes to read the azimuthal circle; observations were taken on 5 pairs of zeros (*face right* and *face left*) giving circle readings at 7° 12′ apart.

The *e.m.s. of observation* of a single measure of an angle $= \sqrt{\dfrac{\text{Sum of squares of apparent errors of observations.}}{\text{No. of observations} - \text{No. of angles} \times \text{No. of changes of zero.}}}$

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

Group	Observer and Instrument	Position of stations	Interval between microscope readings of circle	Number of: Measures on each zero (average)	Angles	Single measures	Single zeros	*e.m.s.* of observation of a single measure	*e.m.s.* of graduation and observation of a single zero
			° ′						
I	Lieutenant J. R. Mc Cullagh, Troughton and Simms' 24-inch Theodolite No. 1.	Hills	7 12	3·11	22	684	220	$\left\{\frac{272\cdot04}{684-220}\right\}^{\frac{1}{2}} = \pm\ 0''\cdot766$	$\left\{\frac{97\cdot57}{220-22}\right\}^{\frac{1}{2}} = \pm\ 0''\cdot702$
II	Lieutenant-Colonel B. R. Branfill, Troughton and Simms' 24-inch Theodolite No. 1	„	7 12	3·10	118	3655	1180	$\left\{\frac{1473\cdot65}{3655-1180}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot772$	$\left\{\frac{487\cdot87}{1180-118}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot678$
III	Lieutenant W. M. Campbell, Troughton and Simms' 24-inch Theodolite No. 1.	„	7 12	3·40	23	783	230	$\left\{\frac{525\cdot45}{783-230}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot975$	$\left\{\frac{123\cdot56}{230-23}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot773$
IV	Major B. R. Branfill and Lieut. J. R. Mc Cullagh, Barrow's 24-inch Theodolite No. 1.	Plains	7 12	3·70	2	74	20	$\left\{\frac{214\cdot38}{74-20}\right\}^{\frac{1}{2}} = \pm\ 1\ \cdot992$	$\left\{\frac{25\cdot72}{20-2}\right\}^{\frac{1}{2}} = \pm\ 1\ \cdot195$
I, II and III	Lieutenant J. R. Mc Cullagh, Lieutenant Colonel B. R. Branfill and Lieut. W. M. Campbell, Troughton and Simms' 24-inch Theodolite No. 1.	Hills	7 12	3·14	163	5122	1630	$\left\{\frac{2271\cdot14}{5122-1630}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot806$	$\left\{\frac{709\cdot00}{1630-163}\right\}^{\frac{1}{2}} = \pm\ 0\ \cdot695$

August, 1887.

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In charge of Computing Office.

MADRAS LONGITUDINAL SERIES.

PRINCIPAL TRIANGULATION. REDUCTION OF FIGURES.

Figure No. 72.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	32	7	8·16	·25
2	57	0	6·43	·06
3	71	33	30·15	·04
4	19	19	17·81	·10
5	29	29	51·42	·12
6	59	37	22·46	·10
7	44	22	23·61	·07
8	46	30	23·66	·20

Equations to be satisfied — **Factor**

$$-x_1 \quad -x_2 \quad +x_5 \quad +x_6 \quad = e_1 = -1{\cdot}871, \qquad \lambda_1$$

$$-x_3 \quad -x_4 \quad +x_7 \quad +x_8 \quad = e_2 = -0{\cdot}583, \qquad \lambda_2$$

$$\left.\begin{matrix} x_1 & +x_2 & +x_3 & +x_4 \\ +x_5 & +x_6 & +x_7 & +x_8 \end{matrix}\right\} = e_3 = -0{\cdot}67, \qquad \lambda_3$$

$$\left.\begin{matrix} 1{\cdot}593\,x_1 & -{\cdot}649\,x_2 & +\ {\cdot}334\,x_3 & -2{\cdot}852\,x_4 \\ +1{\cdot}768\,x_5 & -{\cdot}586\,x_6 & +1{\cdot}022\,x_7 & -\ {\cdot}949\,x_8 \end{matrix}\right\} = e_4 = +3{\cdot}159, \qquad \lambda_4$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4
1	− 1·871	+0·53	...	−0·09	−0·2058
2	− 0·583		+0·41	+0·13	+0·1535
3	− 0·67		*	+0·94	+0·1229
4	+ 3·159				+2·1402

Values of the Factors

$\lambda_1 = -\ 3{\cdot}1734$

$\lambda_2 = -\ 1{\cdot}6175$

$\lambda_3 = -\ 0{\cdot}9685$

$\lambda_4 = +\ 1{\cdot}3425$

Angular errors in seconds

$x_1 = +1{\cdot}086$	$x_5 = -\ {\cdot}212$
$x_2 = +\ {\cdot}080$	$x_6 = -\ {\cdot}493$
$x_3 = +\ {\cdot}044$	$x_7 = -\ {\cdot}085$
$x_4 = -\ {\cdot}318$	$x_8 = -\ {\cdot}772$

$[wx^2] = 11{\cdot}77$

* In the tables of the equations between the factors the co-efficients of the terms below the diagonal are omitted for convenience, the co-efficient of the *pth* term in the *qth* line being always the same as the co-efficient of the *qth* term in the *pth* line.

Figure No. 73.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	53	54	15·27	·05
2	86	39	56·95	·18
3	39	25	52·19	·04
4	40	48	32·29	·04
5	61	38	8·38	·05
6	77	33	22·57	·03
7	55	44	53·91	·06
8	55	48	13·60	·04
9	68	26	56·15	·02
10	79	11	38·90	·06
11	43	13	48·22	·04
12	57	34	36·00	·05
13	49	23	52·61	·03
14	78	7	8·38	·12
15	52	29	2·02	·05
16	80	56	47·53	·04
17	41	49	30·38	·04
18	57	13	44·24	·05

Equations to be satisfied — Factor

$x_1 + x_2 + x_3 \;\ldots\;\ldots\;\ldots = e_1 = +1·178,\quad \lambda_1$

$x_4 + x_5 + x_6 \;\ldots\;\ldots\;\ldots = e_2 = -0·462,\quad \lambda_2$

$x_7 + x_8 + x_9 \;\ldots\;\ldots\;\ldots = e_3 = -0·092,\quad \lambda_3$

$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots\;\ldots = e_4 = -0·098,\quad \lambda_4$

$x_{13} + x_{14} + x_{15} \;\ldots\;\ldots\;\ldots = e_5 = +0·520,\quad \lambda_5$

$x_{16} + x_{17} + x_{18} \;\ldots\;\ldots\;\ldots = e_6 = -1·019,\quad \lambda_6$

$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = +0·51,\quad \lambda_7$

$$\left.\begin{array}{l} 1·216\,x_3 - ·058\,x_2 + ·221\,x_6 - ·540\,x_5 + ·395\,x_9 - ·680\,x_8 \\ + ·635\,x_{12} - 1·064\,x_{11} + ·768\,x_{15} - ·210\,x_{14} + ·644\,x_{18} - 1·117\,x_{17} \end{array}\right\} = e_8 = +0·584,\quad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+ 1·178	+0·27	...	...	...	...	...	+0·05	+ 0·0382
2	− 0·462		+0·12	...	...	...	...	+0·04	− 0·0204
3	− 0·092			+0·12	...	...	...	+0·06	− 0·0193
4	− 0·098				+0·15	...	...	+0·06	− 0·0108
5	+ 0·520					+0·20	...	+0·03	+ 0·0132
6	− 1·019			*			+0·13	+0·04	− 0·0125
7	+ 0·51							+0·28	...
8	+ 0·584								+0·2683

Values of the Factors

$\lambda_1 = +\ 3·5415$

$\lambda_2 = -\ 5·1242$

$\lambda_3 = -\ 2·7233$

$\lambda_4 = -\ 2·2460$

$\lambda_5 = +\ 1·9585$

$\lambda_6 = -\ 9·0438$

$\lambda_7 = +\ 4·0678$

$\lambda_8 = +\ 0·4805$

Angular errors in seconds

$x_1 = +·380$	$x_7 = +·081$	$x_{13} = +·181$
$x_2 = +·633$	$x_8 = -·122$	$x_{14} = +·223$
$x_3 = +·165$	$x_9 = -·051$	$x_{15} = +·116$
$x_4 = -·042$	$x_{10} = +·109$	$x_{16} = -·199$
$x_5 = -·269$	$x_{11} = -·110$	$x_{17} = -·383$
$x_6 = -·151$	$x_{12} = -·097$	$x_{18} = -·437$

$[wx^2] = 19·60$

Figure No. 74.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	47	41	38·57	·04
2	76	38	33·10	·07
3	55	39	55·06	·05
4	80	4	16·75	·05
5	36	38	35·53	·04
6	63	17	14·18	·03
7	60	32	36·62	·09
8	62	19	12·27	·06
9	57	8	14·14	·06
10	55	29	25·15	·03
11	50	45	4·30	·03
12	73	45	33·53	·07
13	62	48	32·94	·06
14	73	51	3·55	·03
15	43	20	27·29	·04
16	53	23	30·40	·04
17	67	0	44·79	·04
18	59	35	50·00	·03

Equations to be satisfied — **Factor**

$$x_1 + x_2 + x_3 \ldots \ldots \ldots = e_1 = +0{\cdot}791, \quad \lambda_1$$
$$x_4 + x_5 + x_6 \ldots \ldots \ldots = e_2 = +0{\cdot}233, \quad \lambda_2$$
$$x_7 + x_8 + x_9 \ldots \ldots \ldots = e_3 = -0{\cdot}847, \quad \lambda_3$$
$$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots = e_4 = -0{\cdot}140, \quad \lambda_4$$
$$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots = e_5 = -0{\cdot}022, \quad \lambda_5$$
$$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots = e_6 = +0{\cdot}065, \quad \lambda_6$$
$$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = +0{\cdot}43, \quad \lambda_7$$
$$\left.\begin{array}{l} {\cdot}683\,x_3 - {\cdot}237\,x_2 + {\cdot}503\,x_6 - 1{\cdot}344\,x_5 + {\cdot}646\,x_9 - {\cdot}525\,x_8 \\ + {\cdot}491\,x_{12} - {\cdot}817\,x_{11} + 1{\cdot}060\,x_{15} - {\cdot}290\,x_{14} + {\cdot}587\,x_{18} - {\cdot}424\,x_{17} \end{array}\right\} = e_8 = -0{\cdot}171, \quad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+0·791	+0·16	...	...	...	...	...	+0·04	+0·0176
2	+0·233		+0·12	...	...	...	..	+0·05	−0·0387
3	−0·847			+0·21	...	...	...	+0·09	+0·0073
4	−0·140				+0·13	...	...	+0·03	−0·0041
5	−0·022					+0·13	...	+0·06	+0·0337
6	+0·065			*			+0·11	+0·04	+0·0006
7	+0·43							+0·31	...
8	−0·171								+0·2394

Values of the Factors

$\lambda_1 = +\ 4{\cdot}3431$

$\lambda_2 = +\ 0{\cdot}6225$

$\lambda_3 = -\ 5{\cdot}1595$

$\lambda_4 = -\ 1{\cdot}7154$

$\lambda_5 = -\ 1{\cdot}2423$

$\lambda_6 = -\ 0{\cdot}3800$

$\lambda_7 = +\ 2{\cdot}6791$

$\lambda_8 = -\ 0{\cdot}6282$

Angular errors in seconds

$x_1 = +{\cdot}281$	$x_7 = -{\cdot}223$	$x_{13} = +{\cdot}086$
$x_2 = +{\cdot}314$	$x_8 = -{\cdot}290$	$x_{14} = -{\cdot}032$
$x_3 = +{\cdot}196$	$x_9 = -{\cdot}334$	$x_{15} = -{\cdot}076$
$x_4 = +{\cdot}165$	$x_{10} = +{\cdot}029$	$x_{16} = +{\cdot}092$
$x_5 = +{\cdot}059$	$x_{11} = -{\cdot}036$	$x_{17} = -{\cdot}004$
$x_6 = +{\cdot}009$	$x_{12} = -{\cdot}133$	$x_{18} = -{\cdot}023$

$[wx^2] = 9{\cdot}45$

Figure No. 75.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	70	27	8·02	·07
2	43	43	43·56	·06
3	65	49	10·36	·07
4	48	57	13·55	·08
5	64	55	36·44	·05
6	66	7	12·25	·03
7	74	2	35·93	·08
8	59	5	23·08	·06
9	46	52	1·34	·09
10	49	40	31·75	·09
11	56	24	23·50	·05
12	73	55	6·11	·09
·13	70	8	10·99	·07
14	66	26	3·56	·05
15	43	25	47·13	·05
16	46	44	19·36	·10
17	65	19	13·44	·08
18	67	56	29·16	·05

Equations to be satisfied

							Factor
x_1	$+x_2$	$+x_3$	...	...	...	$= e_1 = -0·374,$	λ_1
x_4	$+x_5$	$+x_6$	...	...	...	$= e_2 = +0·850,$	λ_2
x_7	$+x_8$	$+x_9$	...	...	...	$= e_3 = -1·714,$	λ_3
x_{10}	$+x_{11}$	$+x_{12}$	...	...	...	$= e_4 = -0·308,$	λ_4
x_{13}	$+x_{14}$	$+x_{15}$	...	...	...	$= e_5 = -0·698,$	λ_5
x_{16}	$+x_{17}$	$+x_{18}$	...	...	...	$= e_6 = -0·447,$	λ_6
x_1	$+x_4$	$+x_7$	$+x_{10}$	$+x_{13}$	$+x_{16}$	$= e_7 = -0·40,$	λ_7
$9x_3$	$-22x_2$	$+9x_6$	$-10x_5$	$+20x_9$	$-13x_8$	$= e_8 = -14·1,$	λ_8
$+6x_{12}$	$-14x_{11}$	$+23x_{15}$	$-9x_{14}$	$+9x_{18}$	$-10x_{17}$		

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·374	+0·20	...	...	...	...	...	+0·07	− 0·69
2	+ 0·850		+0·16	...	...	...	...	+0·08	− 0·23
3	− 1·714			+0·23	...	...	...	+0·08	+ 1·02
4	− 0·308				+0·23	...	...	+0·09	− 0·16
5	− 0·698					+0·17	...	+0·07	+ 0·70
6	− 0·447			*			+0·23	+0·10	− 0·35
7	− 0·40							+0·49	...
8	−14·1								+143·87

Values of the Factors

$\lambda_1 = -\ 2·5911$

$\lambda_2 = +\ 4·3995$

$\lambda_3 = -\ 7·9051$

$\lambda_4 = -\ 2·0393$

$\lambda_5 = -\ 4·6801$

$\lambda_6 = -\ 2·7466$

$\lambda_7 = +\ 1·7297$

$\lambda_8 = -\ 0·0335$

Angular errors in seconds

$x_1 = -\ ·060$	$x_7 = -\ ·494$	$x_{13} = -\ ·206$
$x_2 = -\ ·111$	$x_8 = -\ ·448$	$x_{14} = -\ ·219$
$x_3 = -\ ·203$	$x_9 = -\ ·772$	$x_{15} = -\ ·273$
$x_4 = +\ ·490$	$x_{10} = -\ ·028$	$x_{16} = -\ ·102$
$x_5 = +\ ·237$	$x_{11} = -\ ·079$	$x_{17} = -\ ·193$
$x_6 = +\ ·123$	$x_{12} = -\ ·201$	$x_{18} = -\ ·152$

$[wx^2] = 23·16$

Figure No. 76.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	33	43	36·96	·07
2	74	59	30·64	·04
3	71	16	52·96	·07
4	53	50	13·68	·06
5	53	1	25·78	·04
6	73	8	21·17	·06
7	70	54	59·08	·06
8	52	17	36·00	·04
9	56	47	25·86	·08
10	51	41	51·15	·11
11	56	57	45·89	·06
12	71	20	22·49	·08
13	66	57	55·47	·06
14	41	44	21·00	·07
15	71	17	45·28	·09
16	82	51	23·69	·16
17	69	13	53·99	·05
18	27	54	42·98	·25

Equations to be satisfied

							Factor
x_1	$+x_2$	$+x_3$	...	...	...	$= e_1 = -0·601,$	λ_1
x_4	$+x_5$	$+x_6$	...	...	...	$= e_2 = -0·807,$	λ_2
x_7	$+x_8$	$+x_9$	...	...	...	$= e_3 = -0·388,$	λ_3
x_{10}	$+x_{11}$	$+x_{12}$	...	...	...	$= e_4 = -1·392,$	λ_4
x_{13}	$+x_{14}$	$+x_{15}$	...	...	...	$= e_5 = +1·077,$	λ_5
x_{16}	$+x_{17}$	$+x_{18}$	...	...	...	$= e_6 = -0·358,$	λ_6
x_1	$+x_4$	$+x_7$	$+x_{10}$	$+x_{13}$	$+x_{16}$	$= e_7 = +0·03,$	λ_7
$7x_3$	$-6x_2$	$+6x_6$	$-16x_5$	$+14x_9$	$-16x_8$	$\Big\} = e_8 = +10·4,$	λ_8
$+7x_{12}$	$-13x_{11}$	$+7x_{15}$	$-23x_{14}$	$+40x_{18}$	$-8x_{17}$		

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	− 0·601	+0·18	...	...	...	...	...	+0·07	+ 0·25
2	− 0·807		+0·16	...	...	...	...	+0·06	− 0·28
3	− 0·388			+0·18	...	...	...	+0·06	+ 0·48
4	− 1·392				+0·25	...	...	+0·11	− 0·22
5	+ 1·077					+0·22	...	+0·06	− 0·98
6	− 0·358			*			+0·46	+0·16	+ 9·60
7	+ 0·03							+0·52	...
8	+10·4								+501·89

Values of the Factors

$\lambda_1 = -\ 5·3078$
$\lambda_2 = -\ 6·5615$
$\lambda_3 = -\ 4·0252$
$\lambda_4 = -\ 7·4934$
$\lambda_5 = +\ 4·1840$
$\lambda_6 = -\ 4·9593$
$\lambda_7 = +\ 4·6226$
$\lambda_8 = +\ 0·1233$

Angular errors in seconds

$x_1 = -\ ·048$	$x_7 = +\ ·036$	$x_{13} = +\ ·528$
$x_2 = -\ ·242$	$x_8 = -\ ·240$	$x_{14} = +\ ·095$
$x_3 = -\ ·311$	$x_9 = -\ ·184$	$x_{15} = +\ ·454$
$x_4 = -\ ·116$	$x_{10} = -\ ·316$	$x_{16} = -\ ·054$
$x_5 = -\ ·342$	$x_{11} = -\ ·546$	$x_{17} = -\ ·297$
$x_6 = -\ ·349$	$x_{12} = -\ ·530$	$x_{18} = -\ ·007$

$[wx^2] = 28·18$

Figure No. 77.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	57	20	17·93	·07
2	77	11	9·35	·07
3	45	28	33·20	·03
4	80	28	2·10	·07
5	38	50	33·08	·04
6	60	41	25·52	·05
7	88	31	27·08	·07
8	52	8	8·61	·10
9	39	20	25·71	·04
10	75	20	50·67	·07
11	31	26	0·79	·03
12	73	13	9·81	·07
13	58	19	22·09	·11
14	80	30	57·18	·05
15	41	9	40·54	·07

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 \ldots \ldots = e_1 = -\ 0{\cdot}273,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots = e_2 = -\ 0{\cdot}167,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots = e_3 = +\ 0{\cdot}613,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots = e_4 = +\ 0{\cdot}753,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots = e_5 = -\ 0{\cdot}561,$	λ_5
$x_1 + x_4 + x_7 + x_{10} + x_{13} = e_6 = -\ 0{\cdot}13,$	λ_6
$\left.\begin{array}{l} 21\,x_3 - 5\,x_2 + 12\,x_6 - 26\,x_5 + 25\,x_9 \\ - 16\,x_8 + 7\,x_{12} - 35\,x_{11} + 24\,x_{15} - 3\,x_{14} \end{array}\right\} = e_7 = -\ 10{\cdot}1,$	λ_7

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7
1	− 0·273	+0·17	...	...	...	...	+0·07	+ 0·28
2	− 0·167		+0·16	...	...	...	+0·07	− 0·44
3	+ 0·613			+0·21	...	...	+0·07	− 0·60
4	+ 0·753				+0·17	...	+0·07	− 0·56
5	− 0·561			*		+0·23	+0·11	+ 1·53
6	− 0·13						+0·39	...
7	−10·1							+180·77

Values of the Factors

$\lambda_1 = -\ 1{\cdot}2294$

$\lambda_2 = -\ 0{\cdot}7073$

$\lambda_3 = +\ 3{\cdot}1646$

$\lambda_4 = +\ 4{\cdot}7361$

$\lambda_5 = -\ 1{\cdot}9348$

$\lambda_6 = -\ 0{\cdot}8579$

$\lambda_7 = -\ 0{\cdot}0141$

Angular errors in seconds

$x_1 = -\ {\cdot}146$	$x_6 = -\ {\cdot}044$	$x_{11} = +\ {\cdot}157$
$x_2 = -\ {\cdot}081$	$x_7 = +\ {\cdot}162$	$x_{12} = +\ {\cdot}325$
$x_3 = -\ {\cdot}046$	$x_8 = +\ {\cdot}339$	$x_{13} = -\ {\cdot}307$
$x_4 = -\ {\cdot}110$	$x_9 = +\ {\cdot}112$	$x_{14} = -\ {\cdot}095$
$x_5 = -\ {\cdot}013$	$x_{10} = +\ {\cdot}271$	$x_{15} = -\ {\cdot}159$

$[wx^2] = 7{\cdot}30$

Figure No. 78.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	37	30	13·89	·04
2	84	19	23·30	·06
3	58	10	23·67	·10
4	67	49	38·32	·07
5	30	21	56·35	·15
6	81	48	27·68	·05
7	84	4	29·77	·03
8	61	39	49·01	·05
9	34	15	42·50	·07
10	59	44	26·88	·04
11	63	57	35·73	·06
12	56	18	0·23	·08
13	54	7	8·53	·04
14	47	57	48·84	·09
15	77	55	3·33	·06
16	56	44	2·42	·03
17	75	20	59·38	·05
18	47	55	0·47	·03

Equations to be satisfied — **Factor**

Equation	Factor
$x_1 + x_2 + x_3 \ldots \ldots \ldots = e_1 = -\ 1{\cdot}324,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots \ldots = e_2 = +\ 0{\cdot}363,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots \ldots = e_3 = -\ 0{\cdot}425,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots = e_4 = +\ 0{\cdot}341,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots = e_5 = -\ 1{\cdot}223,$	λ_5
$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots = e_6 = +\ 0{\cdot}305,$	λ_6
$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -\ 0{\cdot}19,$	λ_7
$\left.\begin{array}{l} 13x_3 - 2x_2 + 3x_6 - 36x_5 + 30x_9 - 12x_8 \\ +\ 14x_{12} - 10x_{11} + 4x_{15} - 19x_{14} + 19x_{18} - 5x_{17} \end{array}\right\} = e_8 = -\ 32{\cdot}4,$	λ_8

Equations between the Factors

No. of e	Value of e	λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
		Co-efficients of							
1	− 1·324	+0·20	...	...	...	...	...	+0·04	+ 1·18
2	+ 0·363		+0·27	...	...	...	...	+0·07	− 5·25
3	− 0·425			+0·15	...	...	...	+0·03	+ 1·50
4	+ 0·341				+0·18	...	...	+0·04	+ 0·52
5	− 1·223					+0·19	...	+0·04	− 1·47
6	+ 0·305						+0·11	+0·03	+ 0·32
7	− 0·19							+0·25	...
8	−32·4								+349·40

Values of the Factors

$\lambda_1 = -\ 6{\cdot}1855$
$\lambda_2 = -\ 1{\cdot}4173$
$\lambda_3 = -\ 1{\cdot}8955$
$\lambda_4 = +\ 1{\cdot}9273$
$\lambda_5 = -\ 7{\cdot}6912$
$\lambda_6 = +\ 2{\cdot}7349$
$\lambda_7 = +\ 1{\cdot}4478$
$\lambda_8 = -\ 0{\cdot}1227$

Angular errors in seconds

$x_1 = -{\cdot}190$	$x_7 = -{\cdot}013$	$x_{13} = -{\cdot}250$
$x_2 = -{\cdot}356$	$x_8 = -{\cdot}021$	$x_{14} = -{\cdot}482$
$x_3 = -{\cdot}778$	$x_9 = -{\cdot}391$	$x_{15} = -{\cdot}491$
$x_4 = +{\cdot}002$	$x_{10} = +{\cdot}135$	$x_{16} = +{\cdot}126$
$x_5 = +{\cdot}450$	$x_{11} = +{\cdot}189$	$x_{17} = +{\cdot}167$
$x_6 = -{\cdot}089$	$x_{12} = +{\cdot}017$	$x_{18} = +{\cdot}012$

$[wx^2] = 23{\cdot}08$

Figure No. 79.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	44	6	14·59	·04
2	55	55	45·68	·10
3	79	58	3·26	·15
4	57	8	31·13	·07
5	53	14	38·81	·07
6	69	36	53·01	·04
7	78	46	51·16	·11
8	48	34	10·76	·02
9	52	39	0·75	·05
10	69	22	17·51	·07
11	58	1	5·39	·02
12	52	36	39·96	·06
13	70	27	12·77	·05
14	61	25	55·36	·10
15	48	6	55·01	·15
16	40	8	52·58	·03
17	82	5	9·81	·08
18	57	46	1·19	·10

Equations to be satisfied — Factor

$x_1 + x_2 + x_3 \ldots \ldots \ldots = e_1 = +\ 0·145,$ λ_1

$x_4 + x_5 + x_6 \ldots \ldots \ldots = e_2 = +\ 0·013,$ λ_2

$x_7 + x_8 + x_9 \ldots \ldots \ldots = e_3 = -\ 0·095,$ λ_3

$x_{10} + x_{11} + x_{12} \ldots \ldots \ldots = e_4 = +\ 0·204,$ λ_4

$x_{13} + x_{14} + x_{15} \ldots \ldots \ldots = e_5 = -\ 0·228,$ λ_5

$x_{16} + x_{17} + x_{18} \ldots \ldots \ldots = e_6 = +\ 0·397,$ λ_6

$x_1 + x_4 + x_7 + x_{10} + x_{13} + x_{16} = e_7 = -\ 0·26,$ λ_7

$$\left.\begin{array}{l} 3x_3 - 14x_2 + 8x_6 - 16x_5 + 16x_9 - 19x_8 \\ + 16x_{12} - 13x_{11} + 18x_{15} - 11x_{14} + 13x_{18} - 3x_{17} \end{array}\right\} = e_8 = -\ 11·6, \quad \lambda_8$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7	λ_8
1	+ 0·145	+0·29	...	...	...	...	...	+0·04	− 0·95
2	+ 0·013		+0·18	...	...	...	...	+0·07	− 0·80
3	− 0·095			+0·18	...	...	...	+0·11	+ 0·42
4	+ 0·204				+0·15	...	...	+0·07	+ 0·70
5	− 0·228					+0·30	...	+0·05	+ 1·60
6	+ 0·397						+0·21	+0·03	+ 1·06
7	− 0·26							+0·37	...
8	−11·6								+158·51

Values of the Factors

$\lambda_1 = +\ 0·4114$

$\lambda_2 = +\ 0·3090$

$\lambda_3 = +\ 0·7903$

$\lambda_4 = +\ 2·6594$

$\lambda_5 = +\ 0·0764$

$\lambda_6 = +\ 2·6557$

$\lambda_7 = -\ 1·7692$

$\lambda_8 = -\ 0·1015$

Angular errors in seconds

$x_1 = -·054$	$x_7 = -·108$	$x_{13} = -·084$
$x_2 = +·183$	$x_8 = +·054$	$x_{14} = +·119$
$x_3 = +·016$	$x_9 = -·041$	$x_{15} = -·263$
$x_4 = -·102$	$x_{10} = +·062$	$x_{16} = +·026$
$x_5 = +·135$	$x_{11} = +·089$	$x_{17} = +·237$
$x_6 = -·020$	$x_{12} = +·062$	$x_{18} = +·134$

$[wx^2] = 3·20$

Figure No. 80.

Observed Angles

No.	Value °	′	″	Reciprocal Weight
1	80	26	47·60	·02
2	56	19	20·74	·04
3	43	13	54·31	·14
4	87	39	35·80	·07
5	33	38	48·17	·08
6	58	41	38·04	·10
7	85	42	52·34	·08
8	45	12	53·90	·05
9	49	4	15·31	·05
10	60	25	2·59	·03
11	73	12	16·37	·03
12	46	22	42·18	·06
13	45	45	41·87	·05
14	68	34	23·02	·02
15	65	39	57·13	·04

Equations to be satisfied — **Factor**

$$x_1 + x_2 + x_3 \;\ldots\;\ldots = e_1 = +0{\cdot}020, \qquad \lambda_1$$

$$x_4 + x_5 + x_6 \;\ldots\;\ldots = e_2 = -0{\cdot}090, \qquad \lambda_2$$

$$x_7 + x_8 + x_9 \;\ldots\;\ldots = e_3 = +0{\cdot}273, \qquad \lambda_3$$

$$x_{10} + x_{11} + x_{12} \;\ldots\;\ldots = e_4 = -0{\cdot}243, \qquad \lambda_4$$

$$x_{13} + x_{14} + x_{15} \;\ldots\;\ldots = e_5 = +0{\cdot}480, \qquad \lambda_5$$

$$x_1 + x_4 + x_7 + x_{10} + x_{13} = e_6 = +0{\cdot}20, \qquad \lambda_6$$

$$\left.\begin{array}{l} 22x_3 - 14x_2 + 13x_6 - 32x_5 + 18x_9 \\ -21x_8 + 20x_{12} - 7x_{11} + 10x_{15} - 8x_{14} \end{array}\right\} = e_7 = -7{\cdot}1, \qquad \lambda_7$$

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7
1	+ 0·020	+0·20	...	...	...	...	+0·02	+ 2·52
2	− 0·090		+0·25	...	...	...	+0·07	− 1·26
3	+ 0·273			+0·18	...	...	+0·08	− 0·15
4	− 0·243				+0·12	...	+0·03	+ 0·99
5	+ 0·480					+0·11	+0·05	+ 0·24
6	+ 0·20						+0·25	...
7	− 7·1							+243·42

Values of the Factors

$\lambda_1 = +\ 0{\cdot}5675$

$\lambda_2 = -\ 0{\cdot}4250$

$\lambda_3 = +\ 1{\cdot}6577$

$\lambda_4 = -\ 1{\cdot}6486$

$\lambda_5 = +\ 4{\cdot}6114$

$\lambda_6 = -\ 0{\cdot}3813$

$\lambda_7 = -\ 0{\cdot}0341$

Angular errors in seconds

$x_1 = +\ {\cdot}004$	$x_6 = -\ {\cdot}087$	$x_{11} = -\ {\cdot}042$
$x_2 = +\ {\cdot}042$	$x_7 = +\ {\cdot}102$	$x_{12} = -\ {\cdot}140$
$x_3 = -\ {\cdot}026$	$x_8 = +\ {\cdot}119$	$x_{13} = +\ {\cdot}211$
$x_4 = -\ {\cdot}056$	$x_9 = +\ {\cdot}052$	$x_{14} = +\ {\cdot}098$
$x_5 = +\ {\cdot}053$	$x_{10} = -\ {\cdot}061$	$x_{15} = +\ {\cdot}171$

$[wx^2] = 3{\cdot}28$

Figure No. 81.

Observed Angles

No.	°	′	″	Reciprocal Weight
1	92	45	4·98	·05
2	35	44	11·63	·04
3	51	30	44·10	·02
4	73	59	34·92	·02
5	36	20	21·44	·04
6	69	40	3·95	·01
7	86	33	47·91	·04
8	48	28	18·58	·04
9	44	57	54·15	·04
10	55	48	42·83	·05
11	79	11	58·79	·03
12	44	59	17·56	·04
13	50	52	49·27	·05
14	85	20	54·26	·04
15	43	46	17·43	·07

Equations to be satisfied

Equation	Factor
$x_1 + x_2 + x_3 \ldots \ldots = e_1 = + 0{\cdot}115,$	λ_1
$x_4 + x_5 + x_6 \ldots \ldots = e_2 = + 0{\cdot}040,$	λ_2
$x_7 + x_8 + x_9 \ldots \ldots = e_3 = + 0{\cdot}452,$	λ_3
$x_{10} + x_{11} + x_{12} \ldots \ldots = e_4 = - 1{\cdot}049,$	λ_4
$x_{13} + x_{14} + x_{15} \ldots \ldots = e_5 = + 0{\cdot}530,$	λ_5
$x_1 + x_4 + x_7 + x_{10} + x_{13} = e_6 = - 0{\cdot}09,$	λ_6
$\left.\begin{matrix} 16x_3 - 29x_2 + 8x_6 - 29x_5 + 22x_9 \\ -19x_8 + 22x_{12} - 4x_{11} + 22x_{15} - 2x_{14} \end{matrix}\right\} = e_7 = - 4{\cdot}5,$	λ_7

Equations between the Factors

No. of e	Value of e	Co-efficients of λ_1	λ_2	λ_3	λ_4	λ_5	λ_6	λ_7
1	+ 0·115	+0·11	...	...	...	...	+0·05	− 0·84
2	+ 0·040		+0·07	...	...	...	+0·02	− 1·08
3	+ 0·452			+0·12	...	...	+0·04	+ 0·12
4	− 1·049				+0·12	...	+0·05	+ 0·76
5	+ 0·530			*		+0·16	+0·05	+ 1·46
6	− 0·09						+0·21	...
7	− 4·5							+160·72

Values of the Factors

$\lambda_1 = + 1{\cdot}0575$

$\lambda_2 = + 0{\cdot}4296$

$\lambda_3 = + 3{\cdot}8683$

$\lambda_4 = - 8{\cdot}5432$

$\lambda_5 = + 3{\cdot}5229$

$\lambda_6 = - 0{\cdot}2626$

$\lambda_7 = - 0{\cdot}0141$.

Angular errors in seconds

$x_1 = + {\cdot}040$	$x_6 = + {\cdot}003$	$x_{11} = - {\cdot}255$
$x_2 = + {\cdot}058$	$x_7 = + {\cdot}144$	$x_{12} = - {\cdot}354$
$x_3 = + {\cdot}017$	$x_8 = + {\cdot}166$	$x_{13} = + {\cdot}163$
$x_4 = + {\cdot}003$	$x_9 = + {\cdot}142$	$x_{14} = + {\cdot}142$
$x_5 = + {\cdot}034$	$x_{10} = - {\cdot}440$	$x_{15} = + {\cdot}225$

$[wx^2] = 12.80$

August, 1887.

W. H. COLE,
In charge of Computing Office.

MADRAS LONGITUDINAL SERIES.

PRINCIPAL TRIANGULATION. TRIANGLES.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			″	″	″	″	″	° ′ ″			
83		III (Kudurĕmukha)	1·056	+ ·437	+ ·024		+ ·461	57 13 43·645	5·1161211,6	130653·53	24·745
		VI (Ánúr)	1·056	+ ·383	− ·001		+ ·382	41 49 29·706	5·0154409,5	103619·37	19·625
		V (Ammĕdikal)	1·057	+ ·199	− ·023		+ ·176	80 56 46·649	5·1859637,2	153448·88	29·062
			3·169				+1·019	180 0 0·000			
84		VI (Ánúr)	·830	− ·116	+ ·039		− ·077	52 29 1·113	5·0248979,9	105900·49	20·057
		V (Ammĕdikal)	·830	− ·181	− ·020		− ·201	49 23 51·579	5·0059083,1	101369·75	19·199
		VIII (Kittávar)	·830	− ·223	− ·019		− ·242	78 7 7·308	5·1161211,6	130653·53	24·745
			2·490				− ·520	180 0 0·000			
85		V (Ammĕdikal)	1·073	− ·109	+ ·025		− ·084	79 11 37·743	5·1814840,1	151874·20	28·764
		VIII (Kittávar)	1·073	+ ·097	+ ·025		+ ·122	57 34 35·049	5·1156519,8	130512·46	24·718
		IX (Pushpagiri)	1·072	+ ·110	− ·050		+ ·060	43 13 47·208	5·0248979,9	105900·49	20·057
			3·218				+ ·098	180 0 0·000			
	358	V (Ammĕdikal)	1·250	− ·081		− ·007	− ·088	55 44 52·572	5·1153656,1	130426·43	24·702
		IX (Pushpagiri)	1·251	+ ·051		− ·046	+ ·005	68 26 54·904	5·1666104,6	146760·93	27·796
		VII (Muchil)	1·251	+ ·122		+ ·053	+ ·175	55 48 12·524	5·1156519,8	130512·46	24·718
			3·752				+ ·092	180 0 0·000			
	359	V (Ammĕdikal)	1·234	+ ·042		− ·009	+ ·033	40 48 31·089	5·0374248,8	108999·59	20·644
		VII (Muchil)	1·234	+ ·151		− ·030	+ ·121	77 33 21·457	5·2118315,9	162866·44	30·846
		IV (Ballamale)	1·234	+ ·269		+ ·039	+ ·308	61 38 7·454	5·1666104,6	146760·93	27·796
			3·702				+ ·462	180 0 0·000			

Note.—The values of the sides are given in the same lines with the opposite angles.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ′ ″			
		V (Ammĕdikal)	1·077	− ·380		+ ·034	− ·346	53 54 13·847	5·1199947,3	131824·07	24·967
	360	IV (Ballamale)	1·077	− ·165		− ·073	− ·238	39 25 50·875	5·0154409,5	103619·37	19·625
		III (Kudurĕmukha)	1·078	− ·633		+ ·039	− ·594	86 39 55·278	5·2118315,9	162866·44	30·846
			3·232				−1·178	180 0 0·000			
		III (Kudurĕmukha)	·939	+ ·530			+ ·530	48 49 8·821	5·0194751,9	104586·39	19·808
	361*	IV (Ballamale)	·940	+ ·493			+ ·493	59 37 22·013	5·0787582,3	119883·18	22·705
		I (Mijár)	·940	− ·044			− ·044	71 33 29·166	5·1199947,3	131824·07	24·967
			2·819				+ ·979	180 0 0·000			
		IV (Ballamale)	·517	+ ·085			+ ·085	44 22 23·178	4·8727712,6	74605·57	14·130
	362*	I (Mijár)	·517	− ·080			− ·080	57 0 5·833	4·9516897,6	89472·54	16·946
		II (Mangalore)	·517	− ·314			− ·314	78 37 30·989	5·0194751,9	104586·39	19·808
			1·551				− ·309	180 0 0·000			
		III (Kudurĕmukha)	·904	+ ·212			+ ·212	29 29 50·728	4·9516897,6	89472·54	16·946
	363*	IV (Ballamale)	·904	+ ·578			+ ·578	103 59 45·744	5·2462971,0	176318·18	33·394
		II (Mangalore)	·904	+ ·772			+ ·772	46 30 23·528	5·1199947,3	131824·07	24·967
			2·712				+1·562	180 0 0·000			
		IX (Pushpagiri)	1·980	− ·196	+ ·041		− ·155	55 39 52·925	5·2293634,2	169575·63	32·117
86		VIII (Kittávar)	1·980	− ·314	+ ·011		− ·303	76 38 30·817	5·3006026,3	199803·29	37·842
		X (Sátanhalli)	1·979	− ·281	− ·052		− ·333	47 41 36·258	5·1814840,1	151874·20	28·764
			5·939				− ·791	180 0 0·000			
		VIII (Kittávar)	1·708	+ ·023	+ ·036		+ ·059	59 35 48·351	5·2010504,9	158873·15	30·090
87		X (Sátanhalli)	1·708	− ·092	− ·007		− ·099	53 23 28·593	5·1698665,6	147865·39	28·005
		XI (Desáni)	1·709	+ ·004	− ·029		− ·025	67 0 43·056	5·2293634,2	169575·63	32·117
			5·125				− ·065	180 0 0·000			
		XI (Desáni)	1·267	+ ·076	+ ·053		+ ·129	43 20 26·152	5·0550705,5	113519·52	21·500
88		X (Sátanhalli)	1·267	− ·086	− ·020		− ·106	62 48 31·567	5·1676743,9	147120·91	27·864
		XIII (Nughallibĕtta)	1·268	+ ·032	− ·033		− ·001	73 51 2·281	5·2010504,9	158873·15	30·090
			3·802				+ ·022	180 0 0·000			
		X (Sátanhalli)	1·040	− ·029	+ ·047		+ ·018	55 29 24·128	5·0820455,2	120794·04	22·878
89		XIII (Nughallibĕtta)	1·040	+ ·133	+ ·004		+ ·137	73 45 32·627	5·1484175,1	140740·00	26·655
		XIV (Náráyandurga)	1·040	+ ·036	− ·051		− ·015	50 45 3·245	5·0550705,5	113519·52	21·500
			3·120				+ ·140	180 0 0·000			
		IX (Pushpagiri)	2·075	− ·059		+ ·068	+ ·009	36 38 33·464	5·1254662,5	133495·38	25·283
	364	X (Sátanhalli)	2·076	− ·165		+ ·004	− ·161	80 4 14·513	5·3430670,1	220326·65	41·729
		XII (Adhúrbĕtta)	2·076	− ·009		− ·072	− ·081	63 17 12·023	5·3006026,3	199803·29	37·842
			6·227				− ·233	180 0 0·000			
		X (Sátanhalli)	1·292	+ ·223		+ ·028	+ ·251	60 32 35·579	5·1410843,2	138383·51	26·209
	365	XII (Adhúrbĕtta)	1·293	+ ·290		+ ·030	+ ·320	62 19 11·297	5·1484175,1	140740·00	26·655
		XIV (Náráyandurga)	1·292	+ ·334		− ·058	+ ·276	57 8 13·124	5·1254662,5	133495·38	25·283
			3·877				+ ·847	180 0 0·000			
		XIII (Nughallibĕtta)	·771	+ ·111	+ ·084		+ ·195	43 43 42·984	4·9474589,0	88605·14	16·781
90		XIV (Náráyandurga)	·771	+ ·203	− ·029		+ ·174	65 49 9·763	5·0679459,3	116935·38	22·147
		XV (Háltibĕtta)	·772	+ ·060	− ·055		+ ·005	70 27 7·253	5·0820455,2	120794·04	22·878
			2·314				+ ·374	180 0 0·000			
		XIV (Náráyandurga)	·463	− ·237	+ ·044		− ·193	64 55 35·784	4·9433411,2	87768·98	16·623
91		XV (Háltibĕtta)	·463	− ·490	+ ·002		− ·488	48 57 12·599	4·8637984,8	73080·00	13·841
		XVII (Adhibĕtta)	·464	− ·123	− ·046		− ·169	66 7 11·617	4·9474589,0	88605·14	16·781
			1·390				− ·850	180 0 0·000			

* These triangles form a pendent to the triangulation of the S. Trigon with which they are connected by only one side. They have therefore no non-circuit corrections, although for convenience they are numbered as non-circuit triangles.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ′ "			
92		XVII (Adhibĕtta)	·688	+ ·448	+ ·073		+ ·521	59 5 22·913	5·0136290,3	103187·96	19·543
		XV (Háltibĕtta)	·688	+ ·494	+ ·013		+ ·507	74 2 35·749	5·0630911,9	115635·50	21·901
		XLIV (Hemagiri)	·688	+ ·772	− ·086		+ ·686	46 52 1·338	4·9433411,2	87768·98	16·623
			2·064				+1·714	180 0 0·000			
93		XV (Háltibĕtta)	·556	+ ·028	+ ·070		+ ·098	49 40 31·292	4·9131427,4	81873·38	15·506
		XLIV (Hemagiri)	·556	+ ·079	− ·015		+ ·064	56 24 23·008	4·9516016,2	89454·38	16·942
		XLIII (Rangaswámibĕtta)	·556	+ ·201	− ·055		+ ·146	73 55 5·700	5·0136290,3	103187·96	19·543
			1·668				+ ·308	180 0 0·000			
	866	XIII (Nughallibĕtta)	·803	+ ·152		+ ·069	+ ·221	67 56 28·578	5·0765323,9	119270·33	22·589
		XV (Háltibĕtta)	·802	+ ·102		+ ·004	+ ·106	46 44 18·664	4·9718174,0	93716·79	17·749
		XVI (Chaudanhalli)	·802	+ ·193		− ·073	+ ·120	65 19 12·758	5·0679459,3	116935·38	22·147
			2·407				+ ·447	180 0 0·000			
	867	XV (Háltibĕtta)	·793	+ ·206		− ·034	+ ·172	70 8 10·369	5·0877122,0	122380·51	23·178
		XVI (Chaudanhalli)	·792	+ ·273		+ ·137	+ ·410	43 25 46·748	4·9516016,2	89454·38	16·942
		XLIII (Rangaswámibĕtta)	·793	+ ·219		− ·103	+ ·116	66 26 2·883	5·0765323,9	119270·33	22·589
			2·378				+ ·698	180 0 0·000			
133		XLVIII (Kolar)	·387	+ ·242	+ ·094		+ ·336	74 59 30·589	4·9770266,5	94847·66	17·964
		XLIX (Bhúpatamma)	·387	+ ·311	− ·052		+ ·259	71 16 52·832	4·9684979,8	93003·21	17·614
		XVIII (Bandapalle)	·387	+ ·048	− ·042		+ ·006	33 43 36·579	4·7365754,9	54522·47	10·326
			1·161				+ ·601	180 0 0·000			
134		XLIX (Bhúpatamma)	·479	+ ·342	− ·004		+ ·338	53 1 25·639	4·8985936,9	79176·02	14·995
		XVIII (Bandapalle)	·479	+ ·116	+ ·082		+ ·198	53 50 13·399	4·9031668,7	80014·16	15·154
		XX (Yĕrrakŏnda)	·479	+ ·349	− ·078		+ ·271	73 8 20·962	4·9770266,5	94847·66	17·964
			1·437				+ ·807	180 0 0·000			
135		XX (Yĕrrakŏnda)	·442	+ ·240	+ ·006		+ ·246	52 17 35·804	4·8742978,7	74868·29	14·180
		XVIII (Bandapalle)	·443	− ·036	+ ·087		+ ·051	70 54 58·688	4·9514891,6	89431·22	16·938
		XXII (Krishnamakŏnda)	·443	+ ·184	− ·093		+ ·091	56 47 25·508	4·8985936,9	79176·02	14·995
			1·328				+ ·388	180 0 0·000			
136		XVIII (Bandapalle)	·307	+ ·316	+ ·078		+ ·394	51 41 51·237	4·7924812,4	62012·79	11·745
		XXII (Krishnamakŏnda)	·307	+ ·546	− ·095		+ ·451	56 57 46·034	4·8211579,1	66245·73	12·547
		XXI (Káraveri)	·308	+ ·530	+ ·017		+ ·547	71 20 22·729	4·8742978,7	74868·29	14·180
			·922				+1·392	180 0 0·000			
	403	XLVIII (Kolar)	·339	+ ·007		+ ·060	+ ·067	27 54 42·708	4·6680268,2	46561·49	8·818
		XVIII (Bandapalle)	·340	+ ·054		− ·105	− ·051	82 51 23·299	4·9942920,5	98694·28	18·692
		XIX (Kurudamale)	·339	+ ·297		+ ·045	+ ·342	69 13 53·993	4·9684979,8	93003·21	17·614
			1·018				+ ·358	180 0 0·000			
	404	XVIII (Bandapalle)	·224	− ·528		− ·100	− ·628	66 57 54·618	4·8086364,1	64363·02	12·190
		XIX (Kurudamale)	·225	− ·454		+ ·056	− ·398	71 17 44·657	4·8211579,1	66245·73	12·547
		XXI (Káraveri)	·224	− ·095		+ ·044	− ·051	41 44 20·725	4·6680268,2	46561·49	8·818
			·673				−1·077	180 0 0·000			
137		XXI (Káraveri)	·251	+ ·081	+ ·044		+ ·125	77 11 9·224	4·8562821,8	71826·08	13·603
		XXII (Krishnamakŏnda)	·251	+ ·046	− ·055		− ·009	45 28 32·940	4·7202972,4	52516·68	9·946
		XXIII (Devarakŏnda)	·251	+ ·146	+ ·011		+ ·157	57 20 17·836	4·7924812,4	62012·79	11·745
			·753				+ ·273	180 0 0·000			
138		XXII (Krishnamakŏnda)	·289	+ ·013	+ ·004		+ ·017	38 50 32·808	4·7131652,2	51661·29	9·784
		XXIII (Devarakŏnda)	·289	+ ·110	+ ·057		+ ·167	80 28 1·978	4·9097333,1	81233·15	15·385
		XXVI (Satghur)	·289	+ ·044	− ·061		− ·017	60 41 25·214	4·8562821,8	71826·08	13·603
			·867				+ ·167	180 0 0·000			

NOTE.—Stations XLIII (Rangaswámibĕtta), XLIV (Hemagiri), XLVIII (Kolar) and XLIX (Bhúpatamma) appertain to the Great Arc Meridional Series, Section 8° to 18°.

No. of Triangle: Circuit	Non-circuit	Number and Name of Station	Spherical Excess	Corrections to Observed Angle: Figure	Circuit	Non-circuit	Total	Corrected Plane Angle	Distance: Log. feet	Feet	Miles
			"	"	"	"	"	° ′ "			
139		XXIII (Devarakŏnda)	·263	− ·162	+ ·046		− ·116	88 31 26·701	4·9109825,6	81467·16	15·429
		XXVI (Satghur)	·262	− ·339	− ·055		− ·394	52 8 7·954	4·8084595,8	64336·82	12·185
		XXV (Mugali)	·262	− ·112	+ ·009		− ·103	39 20 25·345	4·7131652,2	51661·29	9·784
			·787				− ·613	180 0 0·000			
	405	XXI (Káraveri)	·123	+ ·159		+ ·042	+ ·201	41 9 40·618	4·5446196,7	35044·48	6·637
		XXIII (Devarakŏnda)	·124	+ ·307		− ·064	+ ·243	58 19 22·209	4·6562143,6	45312·12	8·582
		XXIV (Patikŏnda)	·124	+ ·095		+ ·022	+ ·117	80 30 57·173	4·7202972,4	52516·68	9·946
			·371				+ ·561	180 0 0·000			
	406	XXIII (Devarakŏnda)	·173	− ·271		− ·050	− ·321	75 20 50·176	4·8129992,2	65012·85	12·313
		XXIV (Patikŏnda)	·172	− ·325		+ ·042	− ·283	73 13 9·355	4·8084595,8	64336·82	12·185
		XXV (Mugali)	·172	− ·157		+ ·008	− ·149	31 26 0·469	4·5446196,7	35044·48	6·637
			·517				− ·753	180 0 0·000			
140		XXVI (Satghur)	·728	+ ·778	− ·010		+ ·768	58 10 23·710	5·0557373,2	113693·93	21·533
		XXV (Mugali)	·728	+ ·356	+ ·080		+ ·436	84 19 23·008	5·1243637,0	133156·90	25·219
		XXVII (Batinkŏnda)	·728	+ ·190	− ·070		+ ·120	37 30 13·282	4·9109825,6	81467·16	15·429
			2·184				+1·324	180 0 0·000			
141		XXV (Mugali)	·655	− ·012	+ ·049		+ ·037	47 54 59·852	4·9405957,5	87215·91	16·518
		XXVII (Batinkŏnda)	·655	− ·126	− ·076		− ·202	56 44 1·563	4·9923663,2	98257·64	18·609
		XXVIII (Muruktŏre)	·655	− ·167	+ ·027		− ·140	75 20 58·585	5·0557373,2	113693·93	21·533
			1·965				− ·305	180 0 0·000			
142		XXVIII (Muruktŏre)	·641	+ ·491	+ ·043		+ ·534	77 55 3·223	5·0600425,2	114826·60	21·747
		XXVII (Batinkŏnda)	·641	+ ·250	− ·068		+ ·182	54 7 8·071	4·9783825,2	95144·24	18·020
		XXX (Pullúr)	·641	+ ·482	+ ·025		+ ·507	47 57 48·706	4·9405957,5	87215·91	16·518
			1·923				+1·223	180 0 0·000			
143		XXVII (Batinkŏnda)	·833	− ·135	− ·034		− ·169	59 44 25·878	5·0429209,1	110387·76	20·907
		XXX (Pullúr)	·833	− ·017	+ ·083		+ ·066	56 17 59·463	5·0266304,1	106323·78	20·137
		XXXI (Anandalamalai)	·833	− ·189	− ·049		− ·238	63 57 34·659	5·0600425,2	114826·60	21·747
			2·499				− ·341	180 0 0·000			
	407	XXVI (Satghur)	·662	− ·450		− ·024	− ·474	30 21 55·214	4·8325498,6	68006·42	12·880
		XXVII (Batinkŏnda)	·662	− ·002		+ ·110	+ ·108	67 49 37·766	5·0954527,0	124581·26	23·595
		XXIX (Kailásgarh)	·663	+ ·089		− ·086	+ ·003	81 48 27·020	5·1243637,0	133156·90	25·219
			1·987				− ·363	180 0 0·000			
	408	XXVII (Batinkŏnda)	·569	+ ·013		+ ·138	+ ·151	84 4 29·352	5·0797350,6	120153·12	22·756
		XXIX (Kailásgarh)	·568	+ ·021		− ·032	− ·011	61 39 48·431	5·0266304,1	106323·78	20·137
		XXXI (Anandalamalai)	·568	+ ·391		− ·106	+ ·285	34 15 42·217	4·8325498,6	68006·42	12·880
			1·705				+ ·425	180 0 0·000			
144		XXX (Pullúr)	1·128	− ·183	+ ·066		− ·117	55 55 44·435	5·1185474,2	131385·49	24·884
		XXXI (Anandalamalai)	1·129	− ·016	− ·120		− ·136	79 58 1·995	5·1936442,1	156186·77	29·581
		XXXII (Kurumkota)	1·128	+ ·054	+ ·054		+ ·108	44 6 13·570	5·0429209,1	110387·76	20·907
			3·385				− ·145	180 0 0·000			
145		XXXI (Anandalamalai)	·979	− ·135	− ·069		− ·204	53 14 37·627	5·0503713,3	112297·81	21·269
		XXXII (Kurumkota)	·979	+ ·102	+ ·133		+ ·235	57 8 30·386	5·0709238,3	117739·95	22·299
		XXXIV (Mávandúr)	·979	+ ·020	− ·064		− ·044	69 36 51·987	5·1185474,2	131385·49	24·884
			2·937				− ·013	180 0 0·000			
146		XXXII (Kurumkota)	·922	+ ·108	+ ·076		+ ·184	78 46 50·422	5·1416548,4	138565·41	26·243
		XXXIV (Mávandúr)	·921	− ·054	− ·143		− ·197	48 34 9·642	5·0249553,5	105914·48	20·060
		XXXVI (Malaipedu)	·922	+ ·041	+ ·067		+ ·108	52 38 59·936	5·0503713,3	112297·81	21·269
			2·765				+ ·095	180 0 0·000			

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ′ ″			
183		XXXII (Kurumkota)	·886	− ·062	+ ·010		− ·052	69 22 16·572	5·0960668,8	124757·55	23·628
		XXXVI (Malaipedu)	·885	− ·080	− ·018		− ·098	58 1 4·407	5·0533505,5	113070·82	21·415
		XXXV (Chĕmbedu)	·885	− ·062	+ ·008		− ·054	52 36 39·021	5·0249553,5	105914·48	20·060
			2·656				− ·204	180 0 0·000			
182		XXXII (Kurumkota)	1·123	+ ·084	− ·005		+ ·079	70 27 11·726	5·1557144,3	143124·65	27·107
		XXXV (Chĕmbedu)	1·123	− ·119	− ·020		− ·139	61 25 54·098	5·1251105,3	133386·08	25·263
		XXXIII (Nagari)	1·122	+ ·263	+ ·025		+ ·288	48 6 54·176	5·0533505,5	113070·82	21·415
			3·368				+ ·228	180 0 0·000			
	409	XXX (Pullúr)	1·061	− ·134		− ·212	− ·346	57 45 59·783	5·1251105,3	133386·08	25·263
		XXXII (Kurumkota)	1·061	− ·026		− ·268	− ·294	40 8 51·225	5·0071974,7	101671·09	19·256
		XXXIII (Nagari)	1·061	− ·237		+ ·480	+ ·243	82 5 8·992	5·1936442,1	156186·77	29·581
			3·183				− ·397	180 0 0·000			
	418*	XXXVI (Malaipedu)	·869	− ·041			− ·041	62 2 19·470	5·0707230,4	117685·51	22·289
		XXXV (Chĕmbedu)	·869	− ·217			− ·217	48 30 54·454	4·9991896,8	99813·59	18·904
		XXXVII (Madras Dome Obsy.)	·869	− ·135			− ·135	69 26 46·076	5·0960668,8	124757·55	23·628
			2·607				− ·393	180 0 0·000			
236		XXXVI (Malaipedu)	·877	− ·042	+ ·046		+ ·004	56 19 19·867	5·0679319,5	116931·63	22·146
		XXXIV (Mávandúr)	·876	+ ·026	− ·082		− ·056	43 13 53·378	4·9833778,7	96244·93	18·228
		XXXVIII (Tirumani)	·877	− ·004	+ ·036		+ ·032	80 26 46·755	5·1416548,4	138565·41	26·243
			2·630				− ·020	180 0 0·000			
237		XXXVIII (Tirumani)	·700	+ ·056	+ ·043		+ ·099	87 39 35·199	5·1359072,7	136743·68	25·898
		XXXIV (Mávandúr)	·700	− ·053	− ·078		− ·131	33 38 47·339	4·8798320,3	75828·43	14·361
		XXXIX (Avirimodu)	·700	+ ·087	+ ·035		+ ·122	58 41 37·462	5·0679319,5	116931·63	22·146
			2·100				+ ·090	180 0 0·000			
	410	XXXIX (Avirimodu)	·425	− ·119		+ ·025	− ·094	45 12 53·381	4·8526936,3	71235·04	13·491
		XXXVIII (Tirumani)	·426	− ·102		− ·028	− ·130	85 42 51·784	5·0003703,1	100085·30	18·956
		XL (Manamai Kunnatúr)	·426	− ·052		+ ·003	− ·049	49 4 14·835	4·8798320,3	75828·43	14·361
			1·277				− ·273	180 0 0·000			
	411	XL (Manamai Kunnatúr)	·461	+ ·042		+ ·020	+ ·062	73 12 15·971	4·9740757,8	94205·39	17·842
		XXXVIII (Tirumani)	·461	+ ·061		− ·024	+ ·037	60 25 2·166	4·9323501,0	85575·63	16·208
		XLI (Pudupák)	·461	+ ·140		+ ·004	+ ·144	46 22 41·863	4·8526936,3	71235·04	13·491
			1·383				+ ·243	180 0 0·000			
	412	XXXVIII (Tirumani)	·513	− ·211		− ·027	− ·238	45 45 41·119	4·8696631,8	74073·56	14·029
		XLI (Pudupák)	·514	− ·098		+ ·019	− ·079	68 34 22·427	4·9833778,7	96244·93	18·228
		XXXVI (Malaipedu)	·513	− ·171		+ ·008	− ·163	65 39 56·454	4·9740757,8	94205·39	17·842
			1·540				− ·480	180 0 0·000			
	413*	XLI (Pudupák)	·198	− ·017			− ·017	51 30 43·885	4·7637818,7	58047·28	10·994
		XXXVI (Malaipedu)	·198	− ·058			− ·058	35 44 11·374	4·6366202,3	43313·19	8·203
		XLII (Nanmangalam)	·199	− ·040			− ·040	92 45 4·741	4·8696631,8	74073·56	14·029
			·595				− ·115	180 0 0·000			
	414*	XXXVI (Malaipedu)	·143	− ·225			− ·225	43 46 17·062	4·6051846,1	40288·83	7·630
		XLII (Nanmangalam)	·143	− ·163			− ·163	50 52 48·964	4·6549809,1	45183·61	8·558
		XLIII (Mángád)	·144	− ·142			− ·142	85 20 53·974	4·7637818,7	58047·28	10·994
			·430				− ·530	180 0 0·000			
	415*	XLII (Nanmangalam)	·076	+ ·440			+ ·440	55 48 43·194	4·5305561,1	33927·83	6·426
		XLIII (Mángád)	·076	+ ·354			+ ·354	44 59 17·838	4·4623427,6	28996·31	5·492
		XLIV (St. Thomas's Mount)	·077	+ ·255			+ ·255	79 11 58·968	4·6051846,1	40288·83	7·630
			·229				+ 1·049	180 0 0·000			

* These triangles form pendents to the triangulation of the S. Trigon each being connected by one side only. They have therefore no non-circuit corrections, although for convenience they are numbered as non-circuit triangles.

No. of Triangle		Number and Name of Station	Spherical Excess	Corrections to Observed Angle				Corrected Plane Angle	Distance		
Circuit	Non-circuit			Figure	Circuit	Non-circuit	Total		Log. feet	Feet	Miles
			"	"	"	"	"	° ′ ″			
	416*	XLI (Pudupák)	·090	− ·034			− ·034	36 20 21·316	4·4372954,6	27371·30	5·184
		XLII (Nanmangalam)	·090	− ·003			− ·003	73 59 34·827	4·6473857,4	44400·28	8·409
		XLV (Injambákam)	·090	− ·003			− ·003	69 40 3·857	4·6366202,3	43313·19	8·203
			·270				− ·040	180 0 0·000			
	417*	XLII (Nanmangalam)	·063	− ·144			− ·144	86 33 47·703	4·5872943,4	38662·90	7·323
		XLV (Injambákam)	·063	− ·166			− ·166	48 28 18·351	4·4623427,4	28996·31	5·492
		XLIV (St. Thomas's Mount)	·062	− ·142			− ·142	44 57 53·946	4·4372954,6	27371·30	5·184
			·188				− ·452	180 0 0·000			

* These triangles form pendents to the triangulation of the S. Trigon each being connected by one side only. They have therefore no non-circuit corrections, although for convenience they are numbered as non-circuit triangles.

July, 1889.

W. H. COLE,
In charge of Computing Office.

MADRAS LONGITUDINAL SERIES.

PRINCIPAL TRIANGULATION. LATITUDES, LONGITUDES AND AZIMUTHS.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	I (Mijár)	13 3 20·50	74 58 39·40	25 54 7·54	4·8727712,6	205 52 53·63	II (Mangalore)
	" "	"	"	257 20 31·09	5·0787582,3	77 24 59·25	III (Kudurĕmukha)
	" "	"	"	328 54 1·19	5·0194751,9	148 56 3·40	IV (Ballamale)
	II (Mangalore)	12 52 14·76	74 53 9·89	238 0 0·70	5·2462971,0	58 5 41·12	III (Kudurĕmukha)
	" "	"	"	284 30 25·13	4·9516897,6	104 33 39·71	IV (Ballamale)
43	III (Kudurĕmukha)	13 7 40·32	75 18 23·26	28 35 49·49	5·1199947,3	208 33 26·36	" "
"	" "	"	"	301 55 53·13	5·0154409,5	121 59 14·02	V (Ammĕdikal)
"	" "	"	"	244 42 8·43	5·1859637,2	64 47 29·73	VI (Ánúr)
	IV (Ballamale)	12 48 32·03	75 7 45·46	247 59 18·31	5·2118315,9	68 4 59·10	V (Ammĕdikal)
	" "	"	"	309 37 27·00	5·0374248,8	129 40 33·62	VII (Muchil)
44	V (Ammĕdikal)	12 58 36·28	75 33 12·77	202 56 1·73	5·1161211,6	22 57 58·97	VI (Ánúr)
"	" "	"	"	27 16 26·77	5·1666104,6	207 13 56·31	VII (Muchil)
"	" "	"	"	252 19 54·13	5·0248979,9	72 23 44·18	VIII (Kittávar)
"	" "	"	"	331 31 32·95	5·1156519,8	151 33 52·42	IX (Pushpagiri)
	VI (Ánúr)	13 18 29·67	75 41 48·43	330 28 57·03	5·0059083,1	150 30 52·31	VIII (Kittávar)
	VII (Muchil)	12 37 2·11	75 21 53·48	263 2 10·08	5·1153656,1	83 6 56·26	IX (Pushpagiri)
	VIII (Kittávar)	13 3 54·54	75 50 13·79	14 49 8·05	5·1814840,1	194 47 40·70	" "
	" "	"	"	298 10 35·26	5·2293634,2	118 16 14·04	X (Sátanhalli)
	" "	"	"	238 34 45·20	5·1698665,6	58 39 36·38	XI (Desáni)
45	IX (Pushpagiri)	12 39 38·08	75 43 41·37	250 27 35·60	5·3006026,3	70 34 35·80	X (Sátanhalli)

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
45	IX (Pushpagiri)	12 39 38·08	75 43 41·37	287 6 11·14	5·3430670,1	107 13 53·85	XII (Adhúrbĕtta)
46	X (Sátanhalli)	12 50 39·07	76 15 24·98	171 39 44·34	5·2010504,9	351 38 51·62	XI (Desáni)
„	„ „	„	„	350 30 19·21	5·1254662,5	170 31 7·95	XII (Adhúrbĕtta)
„	„ „	„	„	234 28 17·18	5·0550705,5	54 31 46·39	XIII (Nughallibĕtta)
„	„ „	„	„	289 57 42·34	5·1484175,1	110 2 37·97	XIV (Náráyandurga)
	XI (Desáni)	13 16 38·27	76 11 31·67	308 18 24·20	5·1676743,9	128 22 49·94	XIII (Nughallibĕtta)
	XII (Adhúrbĕtta)	12 28 52·99	76 19 7·29	232 50 20·54	5·1410843,2	52 54 23·56	XIV (Náráyandurga)
	XIII (Nughallibĕtta)	13 1 32·95	76 30 59·64	340 46 12·73	5·0820455,2	160 47 42·26	„ „
	„ „	„	„	297 2 28·97	5·0679459,3	117 6 25·01	XV (Háltibĕtta)
	„ „	„	„	229 5 59·59	4·9718174,0	49 8 42·26	XVI (Chaudanhalli)
47	XIV (Náráyandurga)	12 42 41·53	76 37 41·63	226 36 52·79	4·9474589,0	46 39 16·99	XV (Háltibĕtta)
„	„ „	„	„	291 32 29·04	4·8637984,8	111 34 59·70	XVII (Adhibĕtta)
	XV (Háltibĕtta)	12 52 45·02	76 48 32·72	163 50 44·48	5·0765323,9	343 49 28·70	XVI (Chaudanhalli)
	„ „	„	„	357 42 3·93	4·9433411,2	177 42 11·78	XVII (Adhibĕtta)
	„ „	„	„	233 58 55·64	4·9516016,2	54 1 39·70	XLIII (Rangaswámibĕtta)
	„ „	„	„	283 39 27·49	5·0136290,3	103 43 12·83	XLIV (Hemagiri)
	XVI (Chaudanhalli)	13 11 41·31	76 42 56·77	300 23 41·16	5·0877122,0	120 27 43·38	XLIII (Rangaswámibĕtta)
48	XVII (Adhibĕtta)	12 38 15·11	76 49 8·29	236 47 35·38	5·0630911,9	56 51 10·81	XLIV (Hemagiri)
	XLIII (Rangaswámibĕtta)	13 1 26·52	77 0 44·72	340 6 33·45	4·9131427,4	160 7 36·40	„ „
49	XLIV (Hemagiri)	12 48 42·80	77 5 26·29				
	XLVIII (Kolar)	13 8 47·28	78 8 16·76	0 48 11·80	4·7365754,9	180 48 10·05	XLIX (Bhúpatamma)
	„ „	„	„	285 48 40·82	4·9684979,8	105 52 6·23	XVIII (Bandapalle)
	„ „	„	„	257 53 57·78	4·9942920,5	77 57 40·46	XIX (Kurudamale)
68	XLIX (Bhúpatamma)	12 59 46·52	78 8 9·03	252 5 3·27	4·9770266,5	72 8 29·27	XVIII (Bandapalle)
„	„ „	„	„	305 6 29·38	4·9031668,7	125 8 57·50	XX (Yĕrrakŏnda)
	XVIII (Bandapalle)	13 4 35·48	78 23 22·25	188 43 29·87	4·6680268,2	8 43 46·13	XIX (Kurudamale)
	„ „	„	„	18 18 15·39	4·8985936,9	198 17 18·95	XX (Yĕrrakŏnda)
	„ „	„	„	255 41 24·71	4·8211579,1	75 43 51·95	XXI (Káraveri)
	„ „	„	„	307 23 16·26	4·8742978,7	127 25 31·74	XXII (Krishnamakŏnda)
	XIX (Kurudamale)	13 12 11·98	78 24 33·76	297 26 1·24	4·8086364,1	117 28 12·90	XXI (Káraveri)
69	XX (Yĕrrakŏnda)	12 52 9·83	78 19 10·84	250 34 55·19	4·9514891,6	70 38 5·79	XXII (Krishnamakŏnda)
	XXI (Káraveri)	13 7 17·67	78 34 11·92	4 23 28·91	4·7924812,4	184 23 18·08	„ „
	„ „	„	„	287 12 19·44	4·7202972,4	107 14 14·49	XXIII (Devarakŏnda)
	„ „	„	„	246 2 38·69	4·6562143,6	66 4 14·04	XXIV (Patikŏnda)
70	XXII (Krishnamakŏnda)	12 57 4·36	78 33 23·89	229 51 51·27	4·8562821,8	49 53 56·41	XXIII (Devarakŏnda)
„	„ „	„	„	268 42 24·37	4·9097333,1	88 45 28·49	XXVI (Satghur)
	XXIII (Devarakŏnda)	13 4 43·44	78 42 39·56	165 33 36·83	4·5446196,7	345 33 16·74	XXIV (Patikŏnda)
	„ „	„	„	240 54 27·18	4·8084595,8	60 56 36·37	XXV (Mugali)
	„ „	„	„	329 25 54·14	4·7131652,2	149 26 54·00	XXVI (Satghur)
	XXIV (Patikŏnda)	13 10 20·07	78 41 11·10	272 20 7·21	4·8129992,2	92 22 37·01	XXV (Mugali)

NOTE.—Stations XLIII (Rangaswámibĕtta), XLIV (Hemagiri), XLVIII (Kolar) and XLIX (Bhúpatamma) appertain to the Great Arc Meridional Series, Section 8° to 18°.

Station A				Side AB			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	XXV (Mugali)	13 9 53·56	78 52 8·65	21 36 10·77	4·9109825,6	201 35 2·21	XXVI (Satghur)
	" "	"	"	297 16 47·03	5·0557373,2	117 20 38·61	XXVII (Batinkŏnda)
	" "	"	"	249 21 46·52	4·9923663,2	69 25 19·35	XXVIII (Muruktŏre)
71	XXVI (Satghur)	12 57 22·19	78 47 5·29	259 45 26·65	5·1243637,0	79 50 24·60	XXVII (Batinkŏnda)
"	" "	"	"	290 7 22·53	5·0954527,0	110 11 46·47	XXIX (Kailásgarh)
72	XXVII (Batinkŏnda)	13 1 16·11	79 9 10·94	174 4 40·83	4·9405957,5	354 4 20·11	XXVIII (Muruktŏre)
"	" "	"	"	12 0 46·17	4·8325498,6	192 0 14·16	XXIX (Kailásgarh)
"	" "	"	"	228 11 49·54	5·0600425,2	48 15 6·37	XXX (Pullúr)
"	" "	"	"	287 56 16·25	5·0266304,1	108 0 5·96	XXXI (Anandalamalai)
	XXVIII (Muruktŏre)	13 15 36·59	79 7 39·82	276 9 16·25	4·9783825,2	96 12 55·72	XXX (Pullúr)
	XXIX (Kailásgarh)	12 50 16·30	79 6 47·85	253 40 3·16	5·0797350,6	73 44 23·17	XXXI (Anandalamalai)
	XXX (Pullúr)	13 13 54·91	79 23 37·64	351 57 6·08	5·0429209,1	171 57 41·45	" "
	" "	"	"	296 1 20·51	5·1936442,1	116 6 43·27	XXXII (Kurumkota)
	" "	"	"	238 15 19·67	5·0071974,7	58 18 41·27	XXXIII (Nagari)
73	XXXI (Anandalamalai)	12 55 50·73	79 26 13·94	251 55 44·58	5·1185474,2	72 0 28·57	XXXII (Kurumkota)
"	" "	"	"	305 10 23·18	5·0709238,3	125 13 59·27	XXXIV (Mávandúr)
93	XXXII (Kurumkota)	13 2 34·14	79 47 17·68	156 15 35·56	5·1251105,3	336 13 31·22	XXXIII (Nagari)
"	" "	"	"	14 51 57·21	5·0503713,3	194 50 52·24	XXXIV (Mávandúr)
"	" "	"	"	226 42 48·41	5·0533505,5	46 45 58·02	XXXV (Chĕmbedu)
"	" "	"	"	296 5 5·86	5·0249553,5	116 8 41·91	XXXVI (Malaipedu)
92	XXXIII (Nagari)	13 22 45·08	79 38 13·62	288 6 35·92	5·1557144,3	108 11 53·24	XXXV (Chĕmbedu)
74	XXXIV (Mávandúr)	12 44 37·47	79 42 26·53	243 25 2·80	5·1416548,4	63 29 41·05	XXXVI (Malaipedu)
"	" "	"	"	286 38 57·06	5·0679319,5	106 43 5·81	XXXVIII (Tirumani)
"	" "	"	"	320 17 45·10	5·1359072,7	140 20 57·43	XXXIX (Avirimodu)
	XXXV (Chĕmbedu)	13 15 22·76	80 1 11·17	354 9 18·11	5·0960668,8	174 9 47·20	XXXVI (Malaipedu)
	" "	"	"	305 38 22·79	5·0707230,4	125 42 3·15	XXXVII (Madras Dome Obsy.)
	XXXVI (Malaipedu)	12 54 51·70	80 3 19·65	236 12 7·54	4·9991896,8	56 15 16·21	" "
	" "	"	"	7 10 20·31	4·9833778,7	187 9 53·45	XXXVIII (Tirumani)
	" "	"	"	301 30 23·34	4·8696631,8	121 32 45·43	XLI (Pudupák)
	" "	"	"	265 46 11·77	4·7637818,7	85 48 22·67	XLII (Nanmangalam)
	" "	"	"	221 59 54·56	4·6549809,1	42 1 3·16	XLIII (Mángád)
	XXXVII (Madras Dome Obsy.)	13 4 2·06	80 17 18·94				
	XXXVIII (Tirumani)	12 39 4·47	80 1 18·25	19 3 29·92	4·8798320,3	199 2 35·60	XXXIX (Avirimodu)
	" "	"	"	293 20 37·71	4·8526936,3	113 23 1·93	XL (Manamai Kunnatúr)
	" "	"	"	232 55 35·08	4·9740757,8	52 58 22·49	XLI (Pudupák)
	XXXIX (Avirimodu)	12 27 13·49	79 57 8·32	244 15 29·40	5·0003703,1	64 18 46·67	XL (Manamai Kunnatúr)
	XL (Manamai Kunnatúr)	12 34 24·25	80 12 18·77	186 35 18·36	4·9323501,0	6 35 40·17	XLI (Pudupák)
	XLI (Pudupák)	12 48 27·50	80 13 58·01	173 3 29·51	4·6366202,3	353 3 17·73	XLII (Nanmangalam)
	" "	"	"	209 23 50·92	4·6473857,4	29 24 39·98	XLV (Injambákam)
	XLII (Nanmangalam)	12 55 33·99	80 13 5·07	136 41 11·77	4·6051846,1	316 40 9·04	XLIII (Mángád)

Station A				Side A B			Station B
Circuit No.	Number and Name of Station	Latitude North	Longitude East of Greenwich	Azimuth at A	Log. Feet	Azimuth at B	Number and Name of Station
		° ′ ″	° ′ ″	° ′ ″		° ′ ″	
	XLII (Nanmangalam)	12 55 33·99	80 13 5·07	192 29 55·04	4·4623427,6	12 30 9·29	XLIV (St. Thomas's Mount)
	" "	"	"	279 3 42·81	4·4372954,6	99 4 43·92	XLV (Injambákam)
	XLIII (Mángád)	13 0 24·72	80 8 25·49	271 40 51·12	4·5305561,1	91 42 8·33	XLIV (St. Thomas's Mount)
	XLIV (St. Thomas's Mount)	13 0 14·79	80 14 8·56	327 32 15·28	4·5872943,4	147 33 2·34	XLV (Injambákam)
	XLV (Injambákam)	12 54 51·18	80 17 38·41				

October, 1889.

W. H. COLE,
In charge of Computing Office.

MADRAS LONGITUDINAL SERIES.

PRINCIPAL TRIANGULATION. HEIGHTS ABOVE MEAN SEA LEVEL.

The following table gives, first, the usual data of the observed vertical angles and the heights of the signal and instrument, &c., in pairs of horizontal lines, the first line of which gives the data for the 1st or the fixed station, and the second line the data for the 2nd or the deduced station. This is followed by the arc contained between the two stations, and then by the terrestrial refraction and the height of the 2nd station above or below the 1st, as computed from the vertical angles in the usual manner. This difference of height applied to the given height above mean sea level of the fixed station, gives that of the deduced station. Usually there are two or three independent values of the height of the deduced station; the details are so arranged as to show these consecutively and their mean in the columns of "Trigonometrical Results." The mean results thus obtained are however liable to receive corrections for the errors generated in the trigonometrical operations, which are shown up by the spirit levelling operations, wherever a junction between the two has been effected. The spirit levelled determinations are always accepted as final, and the trigonometrical heights of stations lying between those fixed by the levelling operations are adjusted by simple proportion to accord with the latter. In the table the spirit levelled values are printed thus, 3420·41, &c., to distinguish them from the adjusted trigonometrical values. The column in which the mean trigonometrical heights are given is barred across where necessary, as after deduction of Manjerabad Auxiliary Station from Stn. IX, page 72—G., to indicate that one set of adjustments ends and another begins. The trigonometrical heights always refer to the upper mark or to the upper surface of the pillar or structure on which the theodolite stood; when a spirit levelled height does not refer to either of these surfaces, it is given in combination with a correction, thus $\left\{ \begin{array}{l} 813{\cdot}98 \\ -3{\cdot}5 \end{array} \right.$, and the sum of these two quantities, in this case 810·48, represents the value with which the corresponding trigonometrical mean height 808·6 is comparable. Descriptions follow these tables, exactly indicating the surfaces on which the levelling staff stood during the determinations of the spirit levelled heights.

When the pillar of the station is perforated, the height given in the last column is that between the upper surface of pillar and the ground level mark-stone in the floor of the passage; otherwise, it is the approximate height of the structure above the ground at the base of the station.

The heights of the initial stations above Mean Sea Level are as follows:—

For the section between Mangalore and the Great Arc Meridional Series, Section 8° to 18°

II (Mangalore) 185·44 feet; IV (Ballamale) $\left\{ \begin{array}{l} 813{\cdot}98 \\ -3{\cdot}5 \end{array} \right.$ feet.

For the section between the Great Arc Meridional Series, Section 8° to 18°, and Madras

XLVIII (Kolar) 4021·2 feet; XLIX (Bhúpatamma) 3698·7 feet; XX (Yĕrrakŏnda) $\left\{ \begin{array}{l} 3356{\cdot}79 \\ -\ 3{\cdot}5 \end{array} \right.$ feet.

Astronomical Date 1872	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Apr. 6, 7	1 58	II (Mangalore)	E 0 17 15·4	16	2·8	5·3	885	47	·053	+623·2	808·6	808·6	813·98	2·0
Feb. 21,22,24,25,27	1 47	IV (Ballamale)	D 0 30 40·7	20	1·5	5·3							− 3·5	
Feb. 21,22,24,25,27	1 47	IV (Ballamale)	D 0 30 40·7	20	1·5	5·3	885	47	·053	−623·2	187·3	187·3	185·44	11·3
Apr. 6, 7	1 58	II (Mangalore)	E 0 17 15·4	16	2·8	5·3								

NOTE.—Stations XLVIII (Kolar) and XLIX (Bhúpatamma) appertain to the Great Arc Meridional Series, Section 8° to 18°.

Astronomical Date 1872	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Apr. 6,7,8	2 3	II (Mangalore)	E 0 16 54·1	16	2·6	5·3	738	14	·018	+ 498·1	683·5	684·3	685	1·4
„ 10,11,12	2 7	I (Mijár)	D 0 28 59·6	16	2·7	5·3								
Feb. 25,26,27	2 20	IV (Ballamale)	D 0 11 41·2	16	2·7	5·3	1034	61	·059	− 121·9	688·6			
Apr. 10,11,12	2 22	I (Mijár)	D 0 3 40·4	20	2·8	5·3								
„ 19	2 12	III (Kudurĕmukha)	D 2 46 47·9	8	2·7	5·3	1185	84	·071	−5523·1	680·9			
„ 10	2 0	I (Mijár)	E 2 29 40·6	6	2·6	5·3								
„ 6,7	2 22	II (Mangalore)	E 1 44 48·3	10	2·6	5·3	1743	130	·074	+6015·8	6201·2	6205·7	6207	1·2
„ 20,22	2 24	III (Kudurĕmukha)	D 2 9 40·6	12	1·1	5·3								
Feb. 21,22,24,25	2 47	IV (Ballamale)	E 2 11 21·7	16	1·8	5·3	1304	101	·077	+5396·2	6206·7			
Apr. 22,28	2 50	III (Kudurĕmukha)	D 2 29 51·1	12	2·7	5·3								
„ 10	2 0	I (Mijár)	E 2 29 40·6	6	2·6	5·3	1185	84	·071	+5523·1	6209·2			
„ 19	2 12	III (Kudurĕmukha)	D 2 46 47·9	8	2·7	5·3								
„ 19,20	3 4	III (Kudurĕmukha)	D 1 11 59·7	12	2·7	5·3	1025	72	·071	−1947·8	4257·9	4259·2	4261	1·2
Mar. 13,14,16,19	3 0	V (Ammĕdikal)	E 0 57 9·9	20	1·6	5·3								
Feb. 24,25,26,27	2 4	IV (Ballamale)	E 1 1 13·7	24	2·6	5·3	1610	114	·071	+3450·0	4260·5			
Mar. 18,19,20	2 5	V (Ammĕdikal)	D 1 24 22·4	16	2·6	5·3								
(1)	1 44	III (Kudurĕmukha)	D 0 40 50·0	12	2·8	5·3	1517	92	·061	−1324·8	4880·9	4882·6	4885	2·2
Mar. 7	1 40	VI (Ánúr)	E 0 18 30·1	8	2·7	5·3								
„ 13,14,15,16	2 16	V (Ammĕdikal)	E 0 6 51·1	20	2·7	5·3	1292	75	·058	+ 625·1	4884·3			
(2)	2 31	VI (Ánúr)	D 0 26 1·9	20	2·7	5·3								
Feb. 19,20,21,22	2 18	IV (Ballamale)	E 0 4 37·1	16	2·8	5·3	1078	68	·063	+ 398·0	1208·5	1207·7	1210	1·3
„ 12,13,14	2 18	VII (Muchil)	D 0 20 29·3	16	2·6	5·3								
Mar. 14,15,16	2 37	V (Ammĕdikal)	D 1 21 56·7	16	2·8	5·3	1451	101	·070	−3052·4	1206·8			
Feb. 14,15	2 34	VII (Muchil)	E 1 1 0·4	16	2·6	5·3								
Mar. 13,14,15	2 1	V (Ammĕdikal)	D 0 23 35·6	16	2·8	5·3	1047	57	·054	− 484·6	3774·6	3773·8	3777	11·0
Jan. 7,8,9	2 1	VIII (Kittávar)	E 0 7 51·4	20	2·7	5·3								
„ 13,14	2 31	VI (Ánúr)	D 0 45 8·6	16	2·9	5·3	1002	60	·060	−1112·3	3770·3			
„ 5,6,7	2 30	VIII (Kittávar)	E 0 30 16·1	16	2·6	5·3								
„ 26,27,28,29	2 41	IX (Pushpagiri)	D 0 52 46·3	24	2·6	5·3	1502	89	·059	−1841·6	3776·6			
„ 5,6,7	2 41	VIII (Kittávar)	E 0 30 36·7	16	4·3	5·3								
Mar. 13,14,15	2 39	V (Ammĕdikal)	E 0 26 21·9	16	2·7	5·3	1291	85	·066	+1358·6	5617·8	5616·8	5620	1·8
Jan. 27,28,29	2 38	IX (Pushpagiri)	D 0 45 11·4	16	2·6	5·3								
Feb. 12,13,14,15	2 2	VII (Muchil)	E 1 46 52·5	20	2·7	5·3	1290	90	·070	+4410·9	5618·6			
Jan. 26,27,28,29	2 3	IX (Pushpagiri)	D 2 5 30·8	16	2·8	5·3								
„ 5,6,7	2 41	VIII (Kittávar)	E 0 30 36·7	16	4·3	5·3	1502	89	·059	+1841·6	5614·1			
„ 26,27,28,29	2 41	IX (Pushpagiri)	D 0 52 46·3	24	2·6	5·3								

(1) The mean of observations taken on 23rd April, 1872, and 26th February, 1873.
(2) Do. do. 13th and 14th January, 1872, and 7th March, 1873.

Astronomical Date 1872	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Jan. 6	2 5	VIII (Kittávar)	D 0 26 25·0	4	1·3	5·3								
		* Manjerabad					550	32	†·059	− 358·3	3415·5			
„ 26	1 28	IX (Pushpagiri)	D 1 25 43·1	4	1·1	5·3						3416·4	3420·41	‡
		* Manjerabad					951	55	†·058	−2199·6	3417·2			
„ 5,6,7	2 29	VIII (Kittávar)	D 0 17 52·2	16	2·6	5·3	1677	99	·059	− 271·0	3506·0			
1871 Dec. 18,19,22	2 29	X (Sátanhalli)	D 0 6 53·1	16	2·6	5·3						3503·6	3504	2·1
1872 Jan. 26,27,28,29	1 55	IX (Pushpagiri)	D 0 51 2·6	20	2·6	5·3	1976	115	·058	−2118·8	3501·2			
1871 Dec. 17,18,19	1 54	X (Sátanhalli)	E 0 21 50·9	12	2·7	5·3								
1872 Jan. 5,6,7	2 8	VIII (Kittávar)	D 0 10 50·7	16	0·7	5·3	1462	85	·058	+ 1·2	3778·2			
1871-72 Dec. 31, Jan. 1	2 9	XI (Desáni)	D 0 10 48·3	16	2·6	3·1						3777·4	3779	2·1
1871 Dec. 22,23,24	2 41	X (Sátanhalli)	D 0 5 50·3	16	0·5	5·3	1571	87	·055	+ 273·0	3776·6			
1871-72 Dec. 31, Jan. 1	2 40	XI (Desáni)	D 0 17 33·7	16	2·6	3·1								
1872 Jan. 27,28,29	3 10	IX (Pushpagiri)	D 0 59 44·8	16	2·9	5·3	2179	123	·057	−2795·6	2824·4			
1871 Dec. 12,13	3 7	XII (Adhúrbĕtta)	E 0 27 27·9	16	2·7	5·3						2826·7	2828	2·6
„ 17,18,19	2 54	X (Sátanhalli)	D 0 27 13·2	12	2·6	5·3	1320	73	·055	− 674·6	2829·0			
„ 7,8,10	2 53	XII (Adhúrbĕtta)	E 0 7 30·9	20	2·6	5·3								
„ 17,19,22	2 35	X (Sátanhalli)	D 0 19 27·5	16	2·8	5·3	1123	65	·058	− 367·0	3136·6			
Nov. 20,21,23,27	2 34	XIII (Nughallibĕtta)	E 0 2 45·7	16	2·6	5·3								
1871-72 Dec. 31, Jan. 1	2 25	XI (Desáni)	D 0 25 40·8	16	2·8	3·1	1455	81	·055	− 637·4	3140·0	3137·6	3140	1·0
1871 Dec. 27,28	2 25	XIII (Nughallibĕtta)	E 0 4 1·5	20	1·5	5·3								
1868 Apr. 23	1 40	XIV (Náráyandurga)	D 0 21 38·2	12	2·8	5·4	1197	67	·056	− 446·7	3136·3			
„ 30, May 3	1 13	XIII (Nughallibĕtta)	E 0 3 46·6	12	2·7	5·4								
1871 Dec. 17,18,19	2 55	X (Sátanhalli)	D 0 8 18·0	12	2·6	5·3	1392	85	·061	+ 79·7	3583·3			
„ 1,2	2 54	XIV (Náráyandurga)	D 0 12 11·5	12	2·6	5·3								
„ 6,7,9	2 25	XII (Adhúrbĕtta)	E 0 8 42·7	20	2·6	5·3	1368	85	·062	+ 756·0	3582·7	3583·7	3586	1·0
„ 2	2 25	XIV (Náráyandurga)	D 0 28 50·3	12	2·6	5·3								
1868 Apr. 30, May 3	1 13	XIII (Nughallibĕtta)	E 0 3 46·6	12	2·7	5·4	1197	67	·056	+ 446·7	3585·0			
„ 23	1 40	XIV (Náráyandurga)	D 0 21 38·2	12	2·8	5·4								
1871 Dec. 18	3 20	X (Sátanhalli)	D 0 42 24·4	4	1·3	5·3	650	38	†·058	− 714·8	2788·8			
		* Chanráypatna												
Nov. 21	3 22	XIII (Nughallibĕtta)	D 0 26 17·1	4	1·2	5·3	539	31	†·058	− 349·6	2788·0	2787·8	2791·94	‡
		* Chanráypatna												
Dec. 1	2 42	XIV (Náráyandurga)	D 0 35 12·5	4	1·6	5·3	968	59	†·061	− 797·1	2786·6			
		* Chanráypatna												
1868 May 8	1 0	XIII (Nughallibĕtta)	D 0 11 28·6	12	2·7	5·4	1154	61	·053	− 95·3	3042·3			
Apr. 12	1 53	XV (Háltibĕtta)	D 0 5 52·4	12	2·8	5·4						3041·4	3047·49 − 3·5	2·5

* These are auxiliary stations for the determination of height only, and their data are not published in this Volume.
† Assumed. ‡ No pillars built at these stations.

Astronomical Date 1868	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Apr. 23	2 27	XIV (Náráyandurga)	D 0 27 44·2	12	2·7	5·4	876	44	·051	− 543·2	3040·5			
„ 12	2 37	XV (Háltibĕtta)	E 0 14 24·9	12	2·9	5·4								
„ 30	1 34	XIII (Nughallibĕtta)	D 0 24 42·9	12	2·9	5·4	926	32	·035	− 475·5	2664·6			
„ 8	1 46	XVI (Chaudanhalli)	E 0 10 9·9	12	2·8	5·4								
„ 12	2 47	XV (Háltibĕtta)	D 0 19 59·9	12	2·8	5·4	1182	47	·040	− 376·7	2667·3	2664·1	2664	1·0
„ 7	2 30	XVI (Chaudanhalli)	E 0 1 42·5	12	2·7	5·4								
„ 2	2 23	XLIII (Rangaswámibĕtta)	D 0 18 28·7	12	2·9	5·4	1208	65	·054	− 335·2	2660·5			
„ 7,8	3 28	XVI (Chaudanhalli)	E 0 0 20·8	20	2·6	5·4								
„ 23	2 31	XIV (Náráyandurga)	D 0 38 27·4	12	2·6	5·4	721	35	·049	− 699·8	2886·4			
„ 18	2 26	XVII (Adhibĕtta)	E 0 27 22·6	12	2·9	5·4								
„ 11	2 47	XV (Háltibĕtta)	D 0 12 43·7	12	2·6	5·4	871	41	·047	− 154·5	2889·5	2887·7	2888	2·0
„ 18	2 37	XVII (Adhibĕtta)	D 0 0 37·3	16	2·7	5·4								
Mar. 30	1 5	XLIV (Hemagiri)	D 0 14 18·6	12	2·7	5·4	1142	67	·059	− 196·1	2887·2			
Apr. 18	3 17	XVII (Adhibĕtta)	D 0 2 39·2	12	2·7	5·4								
1867														
Jan. 30	2 54	XLIII (Rangaswámibĕtta)	D 0 2 21·1	12	2·7	5·4	812	47	·058	+ 88·9	3084·6			
„ 27	2 52	XLIV (Hemagiri)	D 0 9 49·0	12	2·7	5·4						3084·8	3083	2·9
Apr. 12	1 39	XV (Háltibĕtta)	D 0 6 12·7	12	2·7	5·4	1017	60	·060	+ 40·9	3084·9			
Mar. 30	1 14	XLIV (Hemagiri)	D 0 8 55·9	12	2·7	5·4								
1868														
Apr. 12	1 54	XV (Háltibĕtta)	D 0 8 26·3	12	2·6	5·4	884	53	·060	− 48·3	2995·7	2995·7	2995·74	1·9
„ 2	1 28	XLIII (Rangaswámibĕtta)	D 0 4 43·6	12	2·7	5·4								
1866														
Mar. 30,31	2 47	XLIX (Bhúpatamma)	D 0 20 43·2	12	2·8	5·4	790	45	·057	− 344·0	3354·7	3354·7	3356·79 − 3·5	2
Feb. 28	2 46	XX (Yĕrrakŏnda)	E 0 8 49·9	12	2·8	5·4								
Mar. 22,23	3 0	XLVIII (Kolar)	D 0 51 16·6	12	2·7	5·4	917	53	·058	−1202·1	2819·1			
„ 10,12	2 57	XVIII (Bandapalle)	E 0 37 34·4	12	2·6	5·4								
„ 30,31	2 15	XLIX (Bhúpatamma)	D 0 38 54·0	12	2·6	5·4	935	53	·056	− 879·8	2818·9	2818·8	2819	1·3
„ 12	2 16	XVIII (Bandapalle)	E 0 24 52·2	12	2·8	5·4								
Feb. 28	3 10	XX (Yĕrrakŏnda)	D 0 29 9·3	12	2·7	5·4	785	43	·055	− 534·8	2818·5			
Mar. 10,12	3 10	XVIII (Bandapalle)	E 0 17 16·5	12	2·6	5·4								
1867														
Jan. 17	2 23	XVIII (Bandapalle)	E 0 32 16·1	12	2·8	5·4	462	26	·057	+ 485·8	3304·6			
„ 15	2 7	XIX (Kurudamale)	D 0 39 28·3	12	2·6	5·4						3306·4	3307	1·8
„ 10	3 2	XLVIII (Kolar)	D 0 31 59·2	12	2·9	5·4	973	63	·064	− 713·1	3308·1			
„ 15	2 47	XIX (Kurudamale)	E 0 17 40·3	12	2·7	5·4								
1866														
Mar. 10,12	3 30	XVIII (Bandapalle)	D 0 8 12·6	12	2·6	5·4	740	41	·055	− 56·6	2762·2			
Feb. 23,24	3 28	XXII (Krishnamakŏnda)	D 0 3 0·6	12	2·6	5·4						2762·6	2763	1·7
„ 28	2 20	XX (Yĕrrakŏnda)	D 0 29 19·0	12	2·6	5·4	882	50	·057	−590·4	2762·9			
„ 24	2 14	XXII (Krishnamakŏnda)	E 0 16 4·3	12	2·6	5·4								

NOTE.—Stations XLIII (Rangaswámibĕtta), XLIV (Hemagiri), XLVIII (Kolar) and XLIX (Bhúpatamma) appertain to the Great Arc Meridional Series, Section 8° to 18°.

Astronomical Date 1866	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station – 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Mar. 10,12	2 15	XVIII (Bandapalle)	D 0 17 9·1	12	2·6	5·4	653	29	·044	−232·1	2586·7			
Feb. 20,21 Mar. 14	2 25	XXI (Káraveri)	E 0 6 56·1	24	2·6	5·4						2587·0	2588	1·7
„ 23,24	3 6	XXII (Krishnamakŏnda)	D 0 14 23·9	12	2·6	5·4	615	36	·058	−175·3	2587·3			
„ 20,21	3 6	XXI (Káraveri)	E 0 5 2·9	12	2·8	5·4								
„ 20,21	3 6	XXI (Káraveri)	E 0 5 6·9	12	2·6	5·4	518	30	·058	+139·2	2726·2			
„ 17,18	3 6	XXIII (Devarakŏnda)	D 0 13 6·4	12	2·7	5·4						2726·2	2727	4·2
„ 23,24	2 31	XXII (Krishnamakŏnda)	D 0 7 4·6	12	2·6	5·4	710	42	·060	− 36·4	2726·2			
„ 17,18	2 32	XXIII (Devarakŏnda)	D 0 3 35·3	12	2·8	5·4								
„ 20,21	2 27	XXI (Káraveri)	E 0 20 29·9	12	2·8	5·4	447	25	·057	+316·3	2903·3			
„ 15	2 26	XXIV (Patikŏnda)	D 0 27 29·9	12	2·7	5·4						2903·3	2905	1·6
„ 17,18	2 50	XXIII (Devarakŏnda)	E 0 14 33·7	12	2·8	5·4	347	20	·058	+177·1	2903·3			
„ 15	2 50	XXIV (Patikŏnda)	D 0 20 11·9	12	2·6	5·4								
„ 17,18	2 16	XXIII (Devarakŏnda)	D 0 19 15·9	12	2·6	5·4	635	36	·057	−270·1	2456·1			
„ 10,11	2 21	XXV (Mugali)	E 0 9 36·0	12	2·6	5·4								
„ 15	3 10	XXIV (Patikŏnda)	D 0 28 29·5	12	2·6	5·4	641	36	·057	−446·6	2456·7	2455·9	2458	2·0
„ 10,11	3 11	XXV (Mugali)	E 0 18 44·8	12	2·8	5·4								
„ 3,4	2 53	XXVI (Satghur)	D 0 0 1·8	12	2·6	5·4	807	46	·056	+143·5	2455·0			
„ 10,11	2 53	XXV (Mugali)	D 0 12 8·3	12	2·7	5·4								
„ 23,24	3 10	XXII (Krishnamakŏnda)	D 0 25 6·4	12	2·7	5·4	801	48	·059	−451·6	2311·0			
„ 3,4	3 10	XXVI (Satghur)	E 0 13 7·4	12	2·8	5·4								
„ 17,18	3 24	XXIII (Devarakŏnda)	D 0 31 30·4	12	2·7	5·4	512	30	·058	−414·2	2312·0	2312·0	2314	2
„ 3,4	3 24	XXVI (Satghur)	E 0 23 36·3	12	2·6	5·4								
„ 10,11	2 53	XXV (Mugali)	D 0 12 8·3	12	2·7	5·4	807	46	·056	−143·5	2312·9			
„ 3,4	2 53	XXVI (Satghur)	D 0 0 1·8	12	2·6	5·4								
„ 10,11	2 23	XXV (Mugali)	D 0 25 2·9	12	2·7	5·4	1122	71	·063	−555·4	1900·5			
Jan. 22,23	2 23	XXVII (Batinkŏnda)	E 0 8 32·0	12	2·6	5·4						1900·3	1902	2·5
Feb. 3	2 10	XXVI (Satghur)	D 0 20 15·7	8	2·7	5·4	1313	83	·063	− 411·9	1900·1			
Jan. 22,23	2 10	XXVII (Batinkŏnda)	E 0 1 0·3	12	2·7	5·4								
Feb. 3,4	2 38	XXVI (Satghur)	E 0 2 47·5	12	2·7	5·4	1229	79	·064	+ 427·3	2739·3			
Jan. 28,29	2 37	XXIX (Kailásgarh)	D 0 20 47·2	12	2·7	5·4						2738·5	2741	1·6
„ 22,23	2 58	XXVII (Batinkŏnda)	E 0 37 17·3	12	2·7	5·4	674	43	·064	+ 837·4	2737·7			
„ 28,29	2 58	XXIX (Kailásgarh)	D 0 47 21·5	12	2·7	5·4								
Jan. 22,23	2 43	XXVII (Batinkŏnda)	D 0 39 18·8	12	2·8	5·4	1049	72	·068	− 980·1	920·2			
„ 6	2 43	XXXI (Anandalamalai)	E 0 24 3·3	8	2·7	5·4						920·7	926·96 − 3·5*	1·5
„ 28,29	2 24	XXIX (Kailásgarh)	D 1 0 36·8	12	2·8	5·4	1185	79	·067	−1817·4	921·1			
„ 6	2 24	XXXI (Anandalamalai)	E 0 43 21·8	8	2·7	5·4								

* Assumed height of the rectangular protecting pillar above the circular pillar.

Astronomical Date 1865	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
Apr. 14,15	3 25	XXXI (Anandalamalai)	D 0 24 59·1	12	2·7	5·3	1296	76	·059	− 588·2	335·3	335·3	336·87 − 3·5	4
„ 24,25	3 27	XXXII (Kurumkota)	E 0 5 48·0	12	2·9	5·3								
1866 Jan. 22	3 12	XXVII (Batinkŏnda)	D 0 8 8·4	8	2·9	5·4	1135	71	·063	+ 6·9	1909·3			
„ 18	3 10	XXX (Pullúr)	D 0 8 33·4	8	2·6	5·4								
(1)	3 5	XXXI (Anandalamalai)	E 0 22 37·0	20	2·7	5·3	1094	67	·060	+ 985·9	1909·4	1908·9	1909	1·5
(2)	3 5	XXX (Pullúr)	D 0 38 47·0	20	2·9	5·3								
1865 Apr. 23	2 40	XXXII (Kurumkota)	E 0 23 18·0	8	2·7	5·3	1541	93	·060	+1574·6	1908·0			
„ 9	2 40	XXX (Pullúr)	D 0 46 0·5	12	2·7	5·3								
1866 Feb. 10,11	2 37	XXV (Mugali)	D 0 30 50·5	12	2·7	5·4	969	59	·061	− 676·4	1781·3			
Jan. 18	2 38	XXVIII (Muruktŏre)	E 0 16 28·8	8	2·6	5·4								
„ 22,23	3 23	XXVII (Batinkŏnda)	D 0 11 14·0	12	2·7	5·4	865	53	·062	− 122·0	1780·4	1781·2	1781	2
„ 18	3 23	XXVIII (Muruktŏre)	D 0 1 37·2	8	2·6	5·4								
„ 13,14	3 43	XXX (Pullúr)	D 0 11 29·4	16	2·7	5·4	938	61	·065	− 127·1	1781·8			
„ 18	2 55	XXVIII (Muruktŏre)	D 0 2 17·9	8	2·8	5·4								
1865 Apr. 4,5	2 36	XXX (Pullúr)	E 0 23 10·9	12	2·7	5·3	1004	62	·062	+ 905·0	2813·9			
Mar. 26,28	2 37	XXXIII (Nagari)	D 0 38 0·7	12	2·7	5·3						2814·4	2814	1·5
Apr. 23	3 44	XXXII (Kurumkota)	E 0 54 12·6	8	2·6	5·3	1322	81	·061	+2481·4	2814·8			
Mar. 26,27	3 48	XXXIII (Nagari)	D 1 13 40·0	12	2·8	5·3								
Apr. 14	2 47	XXXI (Anandalamalai)	D 0 22 58·0	8	2·6	5·3	1163	73	·063	− 493·8	429·7			
„ 18,20	2 47	XXXIV (Mávandúr)	E 0 5 52·7	12	2·9	5·3								
„ 23,25	3 33	XXXII (Kurumkota)	D 0 5 58·2	12	2·7	5·3	1113	40	·036	+ 89·0	† 422·4	429·8	430	1·5
„ 18	3 34	XXXIV (Mávandúr)	D 0 11 25·1	8	2·7	5·3								
1880 Jan. 14,15,16	2 28	XXXVIII (Tirumani)	D 0 18 15·2	12	6·0	5·2	1156	77	·067	− 338·1	429·9			
„ 4,5	2 28	XXXIV (Mávandúr)	E 0 1 31·5	8	2·7	5·2								
1865 Apr. 23,25	2 56	XXXII (Kurumkota)	D 0 3 29·4	12	2·6	5·3	1045	60	·058	+ 132·6	466·0			
May 22	2 53	XXXVI (Malaipedu)	D 0 12 5·1	8	2·9	5·3								
(3)	2 45	XXXIV (Mávandúr)	D 0 9 4·9	12	3·7	5·3	1369	84	·062	+ 38·8	468·6			
(4)	2 17	XXXVI (Malaipedu)	D 0 10 59·5	12	4·3	5·3						467·7	468	10
June 9	2 35	XXXVII (Madras Dome Obsy.)	E 0 5 50·0	12	2·7	5·3	986	58	·058	+382·5	466·9			
May 22,23	2 37	XXXVI (Malaipedu)	D 0 20 18·7	12	8·6	3·3								
1880 Jan. 14,15,16	1 58	XXXVIII (Tirumani)	D 0 17 36·7	12	4·8	5·2	952	59	·062	−298·5	469·5			
Feb. 1,2,3	1 59	XXXVI (Malaipedu)	E 0 3 45·1	12	6·0	5·2								
Apr. 24,25	2 31	XXXII (Kurumkota)	D 0 11 41·8	12	27·6*	5·3	1118	53	·047	− 74·5	258·9			
May 11,12	2 31	XXXV (Chĕmbedu)	D 0 5 46·4	12	2·9	10·0*								
Mar. 26	3 8	XXXIII (Nagari)	D 1 13 5·7	8	43·8*	5·3	1412	89	·063	−2566·8	† 247·6			
May 11,13	3 15	XXXV (Chĕmbedu)	E 0 51 43·1	8	4·6	10·0*								

(1) The mean of observations taken on 13th and 15th April, 1865, and 6th January, 1866.
(2) Do. do. 4th „ 5th do. 13th do.
(3) Do. do. 20th April, 1865, and 5th January, 1880.
(4) Do. do. 23rd May, 1865, and 1st and 2nd February, 1880.
* These heights are to be combined with negative signs because the tower at XXXV (Chĕmbedu) had a subsequent permanent addition made to it of 15·4 feet. † Rejected.

Astronomical Date 1865	Mean of Times of observation	Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet: Signal	Height in feet: Instrument	Contained Arc	Terrestrial Refraction: In seconds	Terrestrial Refraction: Decimals of Contained Arc	Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level: Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	Height of Pillar or Tower
	h m		° ′ ″				″							feet
May 22	3 55	XXXVI (Malaipedu)	D 0 14 52·1	8	3·6	5·3	1237	74	·060	− 208·4	259·3	256·8	257	70·3
„ 11,13	3 25	XXXV (Chĕmbedu)	D 0 2 59·4	4	2·6	10·0*								
„ 6	4 23	XLIV (Rĕttambedu)	D 0 1 21·7	8	13·0*	5·3	928	−11	·012	+ 197·3 †	252·1			
„ 11	4 23	XXXV (Chĕmbedu)	D 0 14 21·6	16	11·4	10·0*								
„ 16	17 11	XXXV (Chĕmbedu)	D 0 10 59·6	12	9·3	10·0*	1162	161	·138	− 155·8	‡ 101·0	...	50·58 +30·77	§ 64·3
June 10	17 9	XXXVII (Madras Dome Obsy.)	D 0 2 30·5	8	3·7	5·3								
1880 Jan. 4,5	2 3	XXXIV (Mávandúr)	D 0 8 22·2	8	2·5	5·2	1352	87	·064	+ 60·7	490·5	490·4	490	1·6
„ 9,10	2 3	XXXIX (Avirimodu)	D 0 11 19·7	8	6·0	5·2								
„ 14,15,16	2 5	XXXVIII (Tirumani)	D 0 17 59·5	12	6·0	5·2	750	48	·064	− 277·7	490·3			
„ 9,10	2 5	XXXIX (Avirimodu)	E 0 7 2·1	8	2·7	5·2								
„ 9,10	2 5	XXXIX (Avirimodu)	E 0 7 2·1	8	2·7	5·2	750	48	·064	+ 277·7	768·1	768·1	771·45 − 3·5	3·0
„ 14,15,16	2 5	XXXVIII (Tirumani)	D 0 17 59·5	12	6·0	5·2								
„ 14,15,16	2 10	XXXVIII (Tirumani)	D 0 38 48·9	12	2·5	5·2	704	40	·057	− 693·8	74·2	75·2	75	3·0
„ 19,20	2 10	XL (Manamai Kunnatúr)	E 0 28 18·5	8	6·0	5·2								
„ 9,10	1 52	XXXIX (Avirimodu)	D 0 21 37·3	8	2·5	5·2	990	55	·056	− 413·4	77·0			
„ 19,20	1 52	XL (Manamai Kunnatúr)	E 0 6 53·7	8	6·0	5·2								
„ 26,27,28	2 21	XLI (Pudupák)	D 0 10 22·7	12	6·0	5·2	846	26	·031	− 94·7	74·5			
„ 19,20	2 19	XL (Manamai Kunnatúr)	D 0 2 55·0	8	2·5	5·2								
Feb. 1,2,3	2 22	XXXVI (Malaipedu)	D 0 19 13·0	12	6·0	5·2	733	45	·061	− 299·3	168·4			
Jan. 26,27,28	2 21	XLI (Pudupák)	E 0 8 30·3	12	4·8	5·2								
„ 14,15,16	1 46	XXXVIII (Tirumani)	D 0 28 40·9	12	2·5	5·2	931	60	·064	− 597·9	170·1	169·6	170	3·0
„ 26,27	1 48	XLI (Pudupák)	E 0 15 4·5	8	6·0	5·2								
„ 19,20	2 19	XL (Manamai Kunnatúr)	D 0 2 55·0	8	2·5	5·2	846	26	·031	+ 94·7	170·3			
„ 26,27,28	2 21	XLI (Pudupák)	D 0 10 22·7	12	6·0	5·2								
Feb. 1,2,3	2 3	XXXVI (Malaipedu)	D 0 18 14·9	12	2·5	5·2	574	36	·063	− 234·9	232·8			
„ 10,11,12	2 4	XLII (Nanmangalam)	E 0 9 46·7	12	6·0	5·2								
Jan. 26,27,28	2 11	XLI (Pudupák)	E 0 1 42·1	12	2·5	5·2	428	26	·061	+ 63·8	233·4	232·6	233	3·0
Feb. 10,11,12	2 11	XLII (Nanmangalam)	D 0 8 8·7	12	6·0	5·2								
„ 24,25	2 2	XLIV (St. Thomas's Mount)	D 0 7 27·5	8	2·4	29·0	287	16	·056	− 18·3	231·7			
„ 10,11,12	2 3	XLII (Nanmangalam)	E 0 3 3·2	12	30·7	5·2								
„ 1,2,3	1 49	XXXVI (Malaipedu)	D 0 25 49·4	12	2·5	5·2	447	29	·065	− 294·0	173·7			
„ 6,7	1 50	XLIII (Mángád)	E 0 19 10·1	8	6·0	5·2								
„ 10,11,12	2 1	XLII (Nanmangalam)	D 0 7 55·0	12	6·0	5·2	398	22	·055	− 58·8	173·8	173·6	174	1
„ 6,7	1 59	XLIII (Mángád)	E 0 1 49·0	8	2·5	5·2								
„ 24,25	1 44	XLIV (St. Thomas's Mount)	D 0 12 33·2	8	6·0	29·0	336	22	·065	− 76·8	173·2			
„ 6,7	1 42	XLIII (Mángád)	E 0 7 55·3	8	30·6	5·2								

NOTE.—Station XLIV (Rĕttambedu) appertains to the Madras Meridional and Coast Series.
* These heights are to be combined with negative signs because the tower at XXXV (Chĕmbedu) had a subsequent permanent addition made to it of 15·4 feet. † This value belongs to the Madras Meridional and Coast Series entirely. ‡ Rejected. § This was the height of the top of the pillar, above the ground level, to which the observations refer, but the pillar was subsequently removed.

Astronomical Date		Number and Name of Station	Observed Vertical Angle	Number of observations	Height in feet		Contained Arc	Terrestrial Refraction		Height of 2nd Station − 1st Station in feet	Height in feet of 2nd Station above Mean Sea Level			Height of Pillar or Tower
1880	Mean of Times of observation				Signal	Instrument		In seconds	Decimals of Contained Arc		Trigonometrical Results: By each deduction	Trigonometrical Results: Mean	Final Result	
	h m		° ′ ″				″							feet
Jan. 26,27,28	1 50	XLI (Pudupák)	D 0 14 32·4	12	2·4	5·2	439	6	·014	−138·8	30·8			
Feb. 14,16,17	1 51	XLV (Injambákam)	E 0 7 14·0	12	6·0	5·2								
„ 10,11,12	1 47	XLII (Nanmangalam)	D 0 28 13·3	12	2·5	5·2	270	7	·026	−205·0	27·6	29·0	29	5
„ 14,16,17	1 47	XLV (Injambákam)	E 0 23 15·4	12	2·4	5·2								
„ 24,25	2 8	XLIV (St. Thomas's Mount)	D 0 24 53·0	8	2·5	29·0	382	19	·050	−221·4	28·6			
„ 14,16,17	2 7	XLV (Injambákam)	E 0 19 6·1	12	30·5	5·2								
„ 6,7	1 42	XLIII (Mángád)	E 0 7 55·3	8	30·6	5·2	336	22	·065	+ 76·8	250·4	250·4	250·04	*
„ 24,25	1 44	XLIV (St. Thomas's Mount)	D 0 12 33·2	8	6·0	29·0								

* See description of this station, page 13—G.

Description of Spirit-levelled Points.

When determining the Spirit-levelled heights, given on pages 70—G. to 77—G., the levelling staff stood on the surfaces hereafter described.

II (Mangalore) — On a peg at the foot of the station pillar, height = 174·61 feet. To this value, 10·83 feet (the height of the upper mark-stone above this peg) being added, the height of the upper mark-stone was found to be 185·44 feet.

IV (Ballamale) — On the stone step of the station platform, height = 810·27 feet. To this value, 3·71 feet (the height of the top of the rectangular protecting pillar above this stone step) being added, the height of the upper surface of the rectangular protecting pillar was found to be 813·98 feet.

Mánjarabad Auxiliary Station — On a stone at the foot of the stone parapet wall, height = 3415·64 feet. To this value, 4·77 feet (the height of the station mark, circle and dot, above this stone) being added, the height of the station mark was found to be 3420·41 feet.

Chanráypatna Auxiliary Station — On the station mark consisting of a circle and dot engraved on the north wall of the highest bastion in the N.W. quarter of the old fort.

XV (Háltibĕtta) — On a stone below the foot of the station platform, height = 3034·27 feet. To this value, 13·22 feet (the height of the top of the rectangular protecting pillar above this stone) being added, the height of the upper surface of the rectangular protecting pillar was found to be 3047·49 feet.

XLIII (Rangaswámibĕtta) (Of the Great Arc Meridional Series, Section 8° to 18°) — On the top of the circular pillar, near and opposite N. face of the rectangular protecting pillar.

Description of Spirit-levelled Points.—(Continued).

XX (Yĕrrakŏnda) — On a circle and dot cut on the rock at the side of the station platform, height = 3354·00 feet. To this value, 2·79 feet (the height of the top of the rectangular protecting pillar above this mark) being added, the height of the upper surface of the rectangular protecting pillar was found to be 3356·79 feet.

XXXI (Anandalamalai) — On a rock at the foot of the station platform, height = 914·79 feet. To this value, 12·17 feet (the height of the top of the rectangular protecting pillar above this rock) being added, the height of the upper surface of the rectangular protecting pillar was found to be 926·96 feet.

XXXII (Kurumkota) — On a peg at the foot of the station platform, height = 328·57 feet. To this value, 8·30 feet (the height of the circle and dot on the upper surface of the rectangular protecting pillar above this peg) being added, the height of the upper surface of the rectangular protecting pillar was found to be 336·87 feet.

XXXVII (Madras Dome Observatory) — On the circle of a bench-mark engraved thus G.T.S. O B.M. on the bottom step of the northern entrance to the Madras Dome Observatory, height = 20·87 feet. To this value, 32·71 feet (the height of the upper surface of the granite pillar above this bench-mark) being added, the height of the upper surface of the granite pillar was found to be 53·58 feet.

XXXVIII (Tirumani) — On a rock below the station, height = 603·85 feet. To this value 167·60 feet (the height of the top of the rectangular protecting pillar above this rock) being added, the height of the upper surface of the rectangular protecting pillar was found to be 771·45 feet.

XLIV (St. Thomas's Mount) — On the upper mark—circle and dot—engraved on the large circular slab of stone.

For further particulars of these stations, see pages 4—G. to 13—G.

November, 1889.

W. H. COLE,
In charge of Computing Office.

MADRAS LONGITUDINAL SERIES.

PRINCIPAL TRIANGULATION. AZIMUTHAL OBSERVATIONS.

At II (Mangalore)

Lat. N. 12° 52′ 14″·76; Long. E. 74° 53′ 9″·89 = $4^h\ 59^m\ 32^s{\cdot}7$; Height above Mean Sea Level, 185 feet.
March 1873; observed by Major B. R. Branfill with Barrow's 24-inch Theodolite No. 1.

Star observed		α Ursæ Minoris (West).
Mean Right Ascension 1873·0		$1^h\ 12^m\ 18^s$
Mean North Polar Distance 1873·0		1° 22′ 4″·30
Local Mean Time of Elongation, March 19	Western	$7^h\ 21^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Mar. 19	W.	179 1	+ 27 16 52·46	6 48	+ 0 2·22	+ 27 16 54·68	+ 27 16 42·36	17 34	+ 0 14·81	+ 27 16 57·17
		&	16 49·46	2 45	0 0·36	49·82	16 35·14	21 24	0 21·97	57·11
		359 0	14 6·18	59 41	2 49·83	56·01	15 50·56	37 19	1 6·65	57·21
			13 45·84	62 44	3 7·50	53·34	15 38·22	40 26	1 18·22	56·44
„ 20	W.	259 12	+ 27 16 53·80	2 51	+ 0 0·39	+ 27 16 54·19	+ 27 16 30·12	23 47	+ 0 27·15	+ 27 16 57·27
		&	16 50·66	4 8	0 0·82	51·48	16 36·10	19 57	0 19·11	55·21
		79 12	14 51·92	50 18	2 0·83	52·75	16 45·42	15 38	0 11·72	57·14
			14 41·64	52 24	2 11·08	52·72	16 26·34	26 0	0 32·39	58·73
„ 21	W.	338 25	+ 27 16 35·48	17 47	+ 0 15·18	+ 27 16 50·66	+ 27 16 6·60	33 25	+ 0 53·56	+ 27 16 60·16
		&	16 42·46	13 59	0 9·39	51·85	16 19·28	28 46	0 39·70	58·98
		158 25	16 46·36	9 25	0 4·26	50·62	16 59·00	3 25	0 0·56	59·56
			16 43·42	12 35	0 7·60	51·02	16 58·72	0 55	0 0·04	58·76
							16 34·58	22 10	0 23·56	58·14
							16 28·60	24 37	0 29·05	57·65
„ 22	W.	57 36	+ 27 16 37·18	19 2	+ 0 17·39	+ 27 16 54·57	+ 27 15 45·32	39 5	+ 1 13·23	+ 27 16 58·55
		&	16 44·34	14 2	0 9·46	53·80	15 56·44	35 52	1 1·69	58·13
		237 36	16 40·80	18 30	0 16·42	57·22	16 57·98	1 28	0 0·10	58·08
			16 32·72	20 40	0 20·49	53·21	16 57·48	4 43	0 1·07	58·55
„ 23	W.	136 49	+ 27 16 19·42	28 9	+ 0 38·01	+ 27 16 57·43	+ 27 16 44·88	17 5	+ 0 14·00	+ 27 16 58·88
		&	16 25·20	24 59	0 29·94	55·14	16 48·78	14 35	0 10·20	58·98
		316 48	16 55·86	4 10	0 0·83	56·69	16 57·60	7 15	0 2·53	60·13
			16 52·58	1 45	0 0·15	52·73	16 54·80	10 15	0 5·05	59·85

Abstract of Astronomical Azimuth observed at II (Mangalore) 1873.

By Western Elongation of α Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	179°	359°	259°	79°	338°	158°	58°	238°	137°	317°
Date	March 19		March 20		March 21		March 22		March 23	
	"	"	"	"	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	54·68	57·17	54·19	57·27	50·66	60·16	54·57	58·55	57·43	58·88
	49·82	57·11	51·48	55·21	51·85	58·98	53·80	58·13	55·14	58·98
	56·01	57·21	52·75	57·14	50·62	59·56	57·22	58·08	56·69	60·13
	53·34	56·44	52·72	58·73	51·02	58·76	53·21	58·55	52·73	59·85
						58·14				
						57·65				
Means	53·46	56·98	52·79	57·09	51·04	58·88	54·70	58·33	55·50	59·46
	° ′ "		"		"		"		"	
Means of both faces	+ 27 16 55·22		54·94		54·96		56·52		57·48	
Az. of Star fr. S., by W.	178 35 55·32		55·01		54·70		54·40		54·09	
Az. of Ref. M. „	205 52 50·54		49·95		49·66		50·92		51·57	

		°	′	"
Astronomical Azimuth of Referring Mark or I (Mijár)	by Western Elongation	205	52	50·53
Geodetical Azimuth of Mijár by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 66—G. *ante*	... ...	205	52	53·63
Astronomical — Geodetical Azimuth at II (Mangalore)	... ...	—		3·10

At XIII (Nughallibĕtta)

Lat. N. 13° 1′ 32″·95; Long. E. 76° 30′ 59″·64 = $5^h\ 6^m\ 4^s{\cdot}0$; Height above Mean Sea Level, 3140 feet.
November 1871; observed by Major B. R. Branfill, with Troughton and Simms' 24-inch Theodolite No. 1.

Stars observed	δ Ursæ Minoris (West) and	Cephei 51 (Hev.) (East).
Mean Right Ascension 1871·0	$18^h\ 13^m\ 57^s$	$6^h\ 39^m\ 14^s$
Mean North Polar Distance 1871·0	3° 23′ 37″·75	2° 45′ 41″·81
Local Mean Times of Elongation, November 20	Western $8^h\ 14^m$	Eastern $8^h\ 46^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Nov. 20	W.	354 34	−121 59 33·16	3 7	+ 0 1·15	−121 59 32·01	−121 60 19·30	19 58	+ 0 47·45	−121 59 31·85
		&	59 37·62	6 38	0 5·24	32·38	60 1·84	15 57	0 30·27	31·57
		174 34	61 49·60	34 7	2 18·04	31·56	60 9·36	17 27	0 36·20	33·16
			63 14·94	43 30	3 44·01	30·93	60 51·96	25 57	1 19·96	32·00
„ 20	E.	354 34	−128 17 8·54	30 19	− 1 29·05	−128 18 37·59	−128 18 24·96	11 18	− 0 12·41	−128 18 37·37
		&	17 21·28	28 1	1 16·08	37·36	18 30·90	8 49	0 7·56	38·46
		174 34	18 34·90	5 32	0 2·97	37·87	17 46·70	23 12	0 52·27	38·97
			18 31·08	8 10	0 6·47	37·55	17 31·74	26 31	1 8·28	40·02
„ 21	W.	73 46	−121 60 24·37	21 29	+ 0 54·93	−121 59 29·44	−121 62 10·50	36 26	+ 2 37·92	−121 59 32·58
		&	60 6·66	17 37	0 36·93	29·73	61 46·11	33 36	2 14·33	31·78
		253 46	59 53·98	13 52	0 22·83	31·15	59 34·38	5 29	0 3·57	30·81
			60 33·45	22 49	1 1·78	31·67	59 34·40	4 47	0 2·71	31·69
„ 21	E.	73 46	−128 18 17·78	14 33	− 0 20·54	−128 18 38·32	−128 16 43·88	34 17	− 1 53·75	−128 18 37·63
		&	18 24·45	12 3	0 14·09	38·54	17 6·98	30 32	1 30·27	37·25
		253 46	18 15·76	15 24	0 23·06	38·82	18 37·30	2 20	0 0·53	37·83
			18 5·66	18 42	0 33·99	39·65	18 35·51	4 14	0 1·74	37·25
„ 22	W.	152 58	−121 61 23·22	30 51	+ 1 53·28	−121 59 29·94	−121 60 2·22	16 7	+ 0 30·92	−121 59 31·30
		&	61 6·38	28 23	1 35·89	30·49	59 37·33	6 7	0 4·45	32·88
		332 58	59 34·56	5 24	0 3·48	31·08	61 2·53	27 46	1 31·52	31·01
			59 55·98	14 49	0 26·11	29·87	62 17·44	37 33	2 47·11	30·33
„ 22	E.	152 58	−128 17 41·87	23 57	− 0 55·57	−128 18 37·44	−128 15 31·40	43 55	− 3 6·33	−128 18 37·73
		&	17 56·46	20 25	0 40·40	36·86	15 52·31	41 28	2 46·18	38·49
		332 58	18 7·61	17 45	0 30·64	38·25	18 38·07	1 24	0 0·19	38·26
			17 56·20	20 24	0 40·46	36·66	18 37·91	1 39	0 0·27	38·18

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Nov. 26	W.	311 23	−121 60 1·01	16 18	+ 0 31·65	−121 59 29·36	−121 61 0·05	27 27	+ 1 29·73	−121 59 30·32
		&	59 39·11	8 42	0 9·01	30·10	60 43·81	24 51	1 13·54	30·27
		131 23	60 1·85	16 34	0 32·62	29·23	59 31·03	0 49	0 0·08	30·95
			60 55·42	27 9	1 27·50	27·92	59 36·32	7 3	0 5·91	30·41
„ 26	E.	311 23	−128 15 15·44	45 38	− 3 21·10	−128 18 36·54	−128 17 8·04	30 20	− 1 29·08	−128 18 37·12
		&	15 32·32	43 31	3 2·94	35·26	17 21·51	27 57	1 15·65	37·16
		131 23	18 22·39	11 31	0 12·86	35·25	18 34·61	5 23	0 2·82	37·43
			18 30·26	8 6	0 6·36	36·62	18 26·17	10 12	0 10·12	36·29
„ 27	W.	232 11	−121 60 32·23	23 15	+ 1 4·40	−121 59 27·83	−121 61 51·10	34 17	+ 2 19·97	−121 59 31·13
		&	59 43·95	11 28	0 15·67	28·28	61 33·42	32 8	2 2·97	30·45
		52 11	59 45·40	12 4	0 17·31	28·09	59 31·15	2 36	0 0·81	30·34
			60 15·00	19 59	0 47·43	27·57	59 33·94	4 13	0 2·11	31·83
„ 27	E.	232 11	−128 14 26·33	50 24	− 4 5·05	−128 18 31·38	−128 16 55·40	32 39	− 1 43·15	−128 18 38·55
		&	15 9·53	46 5	3 25·04	34·57	17 10·04	30 20	1 29·05	39·09
		52 11	18 5·25	17 44	0 30·47	35·72	18 37·49	2 4	0 0·41	37·90
			18 11·88	15 19	0 22·74	34·62	18 36·37	0 17	0 0·01	36·38

Abstract of Astronomical Azimuth observed at XIII (Nughallibĕtta) 1871.

1. By Eastern Elongation of Cephei 51 (Hev).

Face	L	R	L	R	L	R	L	R	L	R
Zero	355°	175°	74°	254°	153°	333°	232°	52°	311°	131°
Date	November 20		November 21		November 22		November 27		November 26	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	37·59	37·37	38·32	37·63	37·44	37·73	31·38	38·55	36·54	37·12
	37·36	38·46	38·54	37·25	36·86	38·49	34·57	39·09	35·26	37·16
	37·87	38·97	38·82	37·83	38·25	38·26	35·72	37·90	35·25	37·43
	37·55	40·02	39·65	37·25	36·66	38·18	34·62	36·38	36·62	36·29
Means	37·59	38·71	38·83	37·49	37·30	38·16	34·07	37·98	35·92	37·00
	° ′ ″		″		″		″		″	
Means of both faces	− 128 18 38·15		38·16		37·73		36·03		36·46	
Level Corrections	− 1·48		− 1·11		− 1·16		+ 0·14		+ 0·11	
Corrected Means	− 128 18 39·63		39·27		38·89		35·89		36·35	
Az. of Star fr. S., by W.	182 50 18·37		18·16		17·96		16·73		16·93	
Az. of Ref. M. „	54 31 38·74		38·89		39·07		40·84		40·58	

Abstract of Astronomical Azimuth observed at XIII (Nughallibĕtta) 1871—(*Continued*).

2. By Western Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	355°	175°	74°	254°	153°	333°	232°	52°	311°	131°
Date	November 20		November 21		November 22		November 27		November 26	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	32·01	31·85	29·44	32·58	29·94	31·30	27·83	31·13	29·36	30·32
	32·38	31·57	29·73	31·78	30·49	32·88	28·28	30·45	30·10	30·27
	31·56	33·16	31·15	30·81	31·08	31·01	28·09	30·34	29·23	30·95
	30·93	32·00	31·67	31·69	29·87	30·33	27·57	31·83	27·92	30·41
Means	31·72	32·15	30·50	31·71	30·35	31·38	27·94	30·94	29·15	30·49
	° ′ ″		″		″		″		″	
Means of both faces	− 121 59 31·93		31·11		30·86		29·44		29·82	
Level Corrections	− 1·59		− 0·85		− 0·81		− 0·67		− 1·26	
Corrected Means	− 121 59 33·52		31·96		31·67		30·11		31·08	
Az. of Star fr. S., by W.	176 31 10·47		10·16		9·96		8·42		8·72	
Az. of Ref. M. „	54 31 36·95		38·20		38·29		38·31		37·64	

		°	′	″
Astronomical Azimuth of Referring Mark or X (Sátanhalli)	by Eastern Elongation	54	31	39·62
	by Western „		„	37·88
Astronomical Azimuth of Sátanhalli by observation, mean of above		54	31	38·75
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 67—G. *ante*		54	31	46·39
Astronomical — Geodetical Azimuth at XIII (Nughallibĕtta)		−		7·64

At XXXI (Anandalamalai)

Lat. N. 12° 55′ 50″·73; Long. E. 79° 26′ 13″·94 = 5^h 17^m 44^s·9; Height above Mean Sea Level, 923 feet.
January 1866; observed by Captain B. R. Branfill with Troughton and Simms' 24-inch Theodolite No. 1.

Stars observed	B. A. C. 7291 (West) and	B. A. C. 3199 (East).
Mean Right Ascension 1866·0	20^h 52^m 6^s	9^h 17^m 44^s
Mean North Polar Distance 1866·0	7° 58′ 3″·58	8° 5′ 10″·14
Local Mean Times of Elongation, January 3	Western 7^h 53^m	Eastern 8^h 33^m

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Jan. 3	W.	180 1	+ 16 25 4·98	21 40	+ 2 9·32	+ 16 27 14·30	+ 16 20 51·70	37 15	+ 6 24·78	+ 16 27 16·48
		&	24 21·38	25 3	2 52·64	14·02	21 46·52	34 24	5 28·29	14·81
		0 1					27 5·88	5 52	0 9·53	15·41
							26 54·44	8 33	0 20·18	14·62
„ 3	E.	180 1	+ 0 1 6·86	22 25	− 2 20·59	− 0 1 13·73	+ 0 5 38·38	38 21	− 6 50·20	− 0 1 11·82
		&	− 0 43·28	10 38	0 31·71	14·99	2 49·26	29 25	4 1·79	12·53
		0 1	1 11·60	3 14	0 2·94	14·54	− 1 0·76	7 7	0 14·24	15·00
			1 3·94	6 5	0 10·39	14·33	+ 0 20·40	18 17	1 34·05	13·65
„ 4	W.	259 12	+ 16 24 23·34	25 3	+ 2 53·99	+ 16 27 17·33	+ 16 20 15·48	39 0	+ 7 2·13	+ 16 27 17·61
		&	25 9·60	21 18	2 5·65	15·25	21 5·66	36 28	6 8·91	14·57
		79 12	25 50·06	17 34	1 25·06	15·12	27 14·88	0 19	0 0·03	14·91
			25 17·34	20 39	1 57·56	14·90	27 16·46	2 17	0 1·45	17·91
„ 4	E.	259 12	+ 0 2 5·72	26 36	− 3 17·87	− 0 1 12·15	+ 0 8 1·06	44 41	− 9 15·83	− 0 1 14·77
		&	− 1 0·48	6 42	0 12·59	13·07	4 35·28	35 16	5 46·92	11·64
		79 12	0 49·80	9 10	0 23·59	13·39	− 1 13·50	1 4	0 0·32	13·82
			0 36·48	11 29	0 37·09	13·57	1 13·04	1 18	0 0·47	13·51
„ 5	W.	338 24	+ 16 25 56·36	16 44	+ 1 17·62	+ 16 27 13·98	+ 16 23 45·18	27 34	+ 3 30·73	+ 16 27 15·91
		&	26 23·28	13 37	0 51·34	14·62	24 25·88	24 42	2 49·06	14·94
		158 24	26 2·30	16 39	1 16·45	18·75	27 16·06	2 51	0 2·25	18·31
			25 31·58	19 33	1 45·26	16·84	27 14·98	0 50	0 0·18	15·16
„ 5	E.	338 24	+ 0 2 11·86	26 54	− 3 22·31	− 0 1 10·45	+ 0 8 34·10	45 56	− 9 47·19	− 0 1 13·09
		&	− 0 24·50	13 16	0 49·32	13·82	5 9·74	37 3	6 21·71	11·97
		158 24	1 11·62	2 57	0 2·44	14·06	− 1 0·32	6 50	0 13·10	13·42
			1 4·74	5 33	0 8·66	13·40	1 8·76	4 9	0 4·86	13·62

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT Interval in Time from Elongation	FACE LEFT Reduction in Arc to Time of Elongation	FACE LEFT Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT Interval in Time from Elongation	FACE RIGHT Reduction in Arc to Time of Elongation	FACE RIGHT Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Jan. 6	W.	57 36	+ 16 26 41·40	11 3	+ 0 33·78	+ 16 27 15·18	+ 16 24 56·92	22 29	+ 2 20·03	+ 16 27 16·95
		&	27 6·44	6 14	0 10·75	17·19	25 37·80	18 48	1 37·92	15·72
		237 36	22 50·22	31 12	4 27·70	17·92	26 58·06	8 31	0 20·01	18·07
			21 44·98	34 49	5 32·98	17·96	26 31·58	12 29	0 43·03	14·61
„ 6	E.	57 36	− 0 0 1·02	15 53	− 1 10·63	− 0 1 11·65	+ 0 4 49·90	36 4	− 6 2·86	− 0 1 12·96
		&	1 12·02	0 8	0 0·00	12·02	1 34·28	24 24	2 46·54	12·26
		237 36	+ 0 29·50	19 10	1 43·42	13·92	− 0 56·92	7 23	0 15·34	12·26
			1 52·72	25 36	3 4·63	11·91	0 37·68	11 1	0 34·11	11·79
„ 7	W.	136 53	+ 16 26 39·66	11 42	+ 0 37·93	+ 16 27 17·59	+ 16 24 33·82	24 13	+ 2 42·66	+ 16 27 16·48
		&	26 59·64	8 2	0 17·83	17·47	25 17·10	20 49	2 0·04	17·14
		316 53	24 57·54	22 25	2 18·49	16·03	27 13·94	2 55	0 2·35	16·29
			24 22·10	25 9	2 54·08	16·18	27 6·78	6 5	0 10·20	16·98
„ 7	E.	136 53	+ 0 0 53·76	21 20	− 2 7·45	− 0 1 13·69	+ 0 6 39·06	41 8	− 7 51·22	− 0 1 12·16
		&	− 0 48·24	9 18	0 24·29	12·53	3 6·68	30 29	4 19·49	12·81
		316 53	0 56·96	7 37	0 16·34	13·30	− 1 9·50	3 41	0 3·79	13·29
			0 44·48	10 3	0 28·38	12·86	1 10·48	0 44	0 0·15	10·63

Abstract of Astronomical Azimuth observed at XXXI (Anandalamalai) 1866.

1. By Eastern Elongation of B.A.C. 3199.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	January 3		January 4		January 5		January 6		January 7	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	13·73	11·82	12·15	14·77	10·45	13·09	11·65	12·96	13·69	12·16
	14·99	12·53	13·07	11·64	13·82	11·97	12·02	12·26	12·53	12·81
	14·54	15·00	13·39	13·82	14·06	13·42	13·92	12·26	13·30	13·29
	14·33	13·65	13·57	13·51	13·40	13·62	11·91	11·79	12·86	10·63
Means	14·40	13·25	13·05	13·44	12·93	13·03	12·38	12·32	13·10	12·22
	° ′ ″		″		″		″		″	
Means of both faces	− 0 1 13·83		13·24		12·98		12·35		12·66	
Level Corrections	− 0·17		− 0·94		− 1·04		− 0·75		− 1·32	
Corrected Means	− 0 1 14·00		14·18		14·02		13·10		13·98	
Az. of Star fr. S., by W.	188 18 13·69		13·46		13·24		13·01		12·78	
Az. of Ref. M. „	188 16 59·69		59·28		59·22		59·91		58·80	

Abstract of Astronomical Azimuth observed at XXXI (Anandalamalai) 1866—(*Continued*).

2. By Western Elongation of B.A.C. 7291.

Face	L	R	L	R	L	R	L	R	L	R
Zero	180°	0°	259°	79°	338°	158°	58°	238°	137°	317°
Date	January 3		January 4		January 5		January 6		January 7	
	"	"	"	"	"	"	"	"	"	"
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	14·30 14·02	16·48 14·81 15·41 14·62	17·33 15·25 15·12 14·90	17·61 14·57 14·91 17·91	13·98 14·62 18·75 16·84	15·91 14·94 18·31 15·16	15·18 17·19 17·92 17·96	16·95 15·72 18·07 14·61	17·59 17·47 16·03 16·18	16·48 17·14 16·29 16·98
Means	14·16	15·33	15·65	16·25	16·05	16·08	17·06	16·34	16·82	16·72
	° ' "		"		"		"		"	
Means of both faces	+ 16 27 14·75		15·95		16·06		16·70		16·77	
Level Corrections	−0·51		− 0·66		− 1·02		− 1·15		− 1·02	
Corrected Means	+ 16 27 14·24		15·29		15·04		15·55		15·75	
Az. of Star fr. S., by W.	171 49 44·26		43·97		43·68		43·39		43·11	
Az. of Ref. M. „	188 16 58·50		59·26		58·72		58·94		58·86	

		°	'	"
Astronomical Azimuth of Referring mark ...	by Eastern Elongation	188	16	59·38
	by Western „		„	58·86
	Mean		„	59·12
Angle Referring Mark and XXX (Pullúr) *see page* 38—G. *ante*		− 16	19	23·15
Astronomical Azimuth of Pullúr by observation		171	57	35·97
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 68—G. *ante*		171	57	41·45
Astronomical—Geodetical Azimuth at XXXI (Anandalamalai)		−		5·48

At XLIV (St. Thomas's Mount)

Lat. N. 13° 0′ 14″·79; Long. E. 80° 14′ 8″·56 = 5^h 20^m 56^s·6; Height above Mean Sea Level, 250 feet.
February 1880; observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No. 1.

Stars observed	δ Ursæ Minoris (East) and	Cephei 51 (Hev.) (West).
Mean Right Ascension 1880·0	18^h 11^m 3^s	6^h 43^m 47^s
Mean North Polar Distance 1880·0	3° 23′ 27″·65	2° 46′ 15″·05
Local Mean Times of Elongation, February 21	Eastern 14^h 9^m	Western 14^h 37^m

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark − Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark − Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark − Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Feb. 21	E.	315 2	−170 58 54·41	9 25	− 0 10·56	−170 58 64·97	−170 57 6·96	30 54	− 1 53·44	−170 58 60·40
		&	59 0·61	6 35	0 5·16	65·77	57 30·01	27 26	1 29·44	59·45
		135 3	55 12·04	44 25	3 54·96	67·00	58 38·50	13 55	0 23·12	61·62
			54 41·18	47 7	4 24·37	65·55	58 26·98	17 0	0 34·49	61·47
„ 21	W.	315 2	−164 41 3·39	30 8	+ 1 28·21	−164 39 35·18	−164 39 34·82	5 9	+ 0 2·57	−164 39 32·25
		&	40 43·61	26 24	1 7·72	35·89	39 32·36	2 14	0 0·48	31·88
		135 2	39 45·31	10 6	0 9·89	35·42	41 8·59	31 41	1 37·21	31·38
			39 51·38	12 30	0 15·15	36·23	41 36·43	35 52	2 4·50	31·93
„ 22	E.	34 15	−170 57 46·66	25 52	− 1 19·50	−170 58 66·16	−170 58 54·62	7 34	− 0 6·83	−170 58 61·45
		&	57 59·43	23 19	1 4·61	64·04	58 56·41	5 13	0 3·25	59·66
		214 15	58 47·52	11 53	0 16·83	64·35	57 37·59	26 29	1 23·63	61·22
			58 40·47	13 52	0 22·93	63·40	57 20·88	29 0	1 40·28	61·16
„ 22	W.	34 15	−164 43 20·55	48 1	+ 3 43·73	−164 39 36·82	−164 41 3·45	30 17	+ 1 29·09	−164 39 34·36
		&	42 51·79	45 4	3 17·14	34·65	40 32·11	24 55	1 0·32	31·79
		214 15	39 48·21	11 18	0 12·40	35·81	39 33·78	4 25	0 1·89	31·89
			39 42·94	9 10	0 8·15	34·79	39 36·14	6 57	0 4·68	31·46
„ 23	E.	113 26	−170 56 46·93	33 58	− 2 16·93	−170 58 63·86	−170 58 29·03	16 58	− 0 34·29	−170 58 63·32
		&	57 9·15	31 15	1 55·95	65·10	58 59·90	3 50	0 1·75	61·65
		293 26	58 41·94	13 54	0 23·04	64·98	56 36·88	34 53	2 25·09	61·97
			58 30·86	16 54	0 34·06	64·92	56 7·59	38 14	2 54·25	61·84
„ 23	W.	113 26	−164 40 11·27	19 32	+ 0 37·08	−164 39 34·19	−164 42 2·60	39 12	+ 2 29·25	−164 39 33·35
		&	40 2·03	16 50	0 27·54	34·49	41 36·99	35 45	2 4·17	32·82
		293 26	40 31·20	24 11	0 56·74	34·46	39 32·30	0 32	0 0·03	32·27
			40 50·25	27 53	1 15·31	34·94	39 33·20	3 6	0 0·93	32·27

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark—Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark—Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark—Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark—Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Feb. 24	E.	192 39	−170 57 12·27	30 51	− 1 53·11	−170 58 65·38	−170 58 49·28	10 23	− 0 12·85	−170 58 62·13
		&	57 32·32	27 48	1 31·87	64·19	58 56·19	7 29	0 6·67	62·86
		12 39	58 51·67	10 35	0 13·36	65·03	57 38·97	26 32	1 23·99	62·96
			58 42·35	13 44	0 22·50	64·85	57 17·60	29 32	1 44·05	61·65
„ 24	W.	192 39	−164 40 26·38	23 2	+ 0 51·58	−164 39 34·80	−164 42 44·35	44 24	+ 3 11·42	−164 39 32·93
		&	40 16·41	20 40	0 41·52	34·89	42 21·39	41 38	2 48·35	33·04
		12 39	40 8·99	18 38	0 33·70	35·29	39 36·54	4 33	0 2·01	34·53
			40 22·19	21 46	0 45·96	36·23	39 37·79	6 12	0 3·73	34·06
„ 25	E.	271 51	−170 57 14·60	30 43	− 1 52·06	−170 58 66·66	−170 58 30·88	16 39	− 0 32·97	−170 58 63·85
		&	57 32·67	28 4	1 33·57	66·24	58 42·54	13 15	0 20·88	63·42
		91 51	58 58·96	6 36	0 5·19	64·15	57 17·06	30 8	1 48·27	65·33
			58 54·10	9 32	0 10·83	64·93	56 55·49	32 48	2 8·26	63·75
„ 25	W.	271 51	−164 39 55·77	14 24	+ 0 20·14	−164 39 35·63	−164 41 40·24	36 6	+ 2 6·58	−164 39 33·66
		&	39 47·96	11 42	0 13·30	34·66	41 14·44	32 7	1 40·21	34·23
		91 51	40 29·02	23 39	0 54·20	34·82	39 41·98	8 30	0 7·03	34·95
			40 44·90	26 52	1 9·92	34·98	39 47·43	11 26	0 12·70	34·73

Abstract of Astronomical Azimuth observed at XLIV (St. Thomas's Mount) 1880.

1. By Eastern Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	315°	135°	34°	214°	113°	293°	193°	13°	272°	92°
Date	February 21		February 22		February 23		February 24		February 25	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	64·97	60·40	66·16	61·45	63·86	63·32	65·38	62·13	66·66	63·85
	65·77	59·45	64·04	59·66	65·10	61·65	64·19	62·86	66·24	63·42
	67·00	61·62	64·35	61·22	64·98	61·97	65·03	62·96	64·15	65·33
	65·55	61·47	63·40	61·16	64·92	61·84	64·85	61·65	64·93	63·75
Means	65·82	60·74	64·49	60·87	64·72	62·20	64·86	62·40	65·50	64·09

	February 21	February 22	February 23	February 24	February 25
	° ′ ″	″	″	″	″
Means of both faces	− 170 58 63·28	62·68	63·46	63·63	64·79
Level Corrections	+ 0·13	− 0·11	− 0·07	+ 0·01	− 0·11
Corrected Means	− 170 58 63·15	62·79	63·53	63·62	64·90
Az. of Star fr. S., by W.	183 29 8·64	8·79	8·95	9·10	9·26
Az. of Ref. M. „	12 30 5·49	6·00	5·42	5·48	4·36

Abstract of Astronomical Azimuth observed at XLIV (St. Thomas's Mount) 1880—(*Continued*).

2. By Western Elongation of Cephei 51 (Hev.)

Face	L	R	L	R	L	R	L	R	L	R
Zero	315°	135°	84°	214°	113°	293°	193°	13°	272°	92°
Date	February 21		February 22		February 23		February 24		February 25	
	"	"	"	"	"	"	"	"	"	"
Observed difference	35·18	32·25	36·82	34·36	34·19	33·35	34·80	32·93	35·63	33·66
of Circle-Readings,	35·89	31·88	34·65	31·79	34·49	32·82	34·89	33·04	34·66	34·23
Ref. M. — Star	35·42	31·38	35·81	31·89	34·46	32·27	35·29	34·53	34·82	34·95
reduced to Elongation	36·23	31·93	34·79	31·46	34·94	32·27	36·23	34·06	34·98	34·73
Means	35·68	31·86	35·52	32·38	34·52	32·68	35·30	33·64	35·02	34·39
	° ′ ″		″		″		″		″	
Means of both faces	− 164 39 33·77		33·95		33·60		34·47		34·71	
Level Corrections	0·00		− 0·14		− 0·07		+ 0·04		− 0·08	
Corrected Means	− 164 39 33·77		34·09		33·67		34·43		34·79	
Az. of Star fr. S., by W.	177 9 37·29		37·49		37·70		37·90		38·11	
Az. of Ref. M. „	12 30 3·52		3·40		4·03		3·47		3·32	

			°	′	″
Astronomical Azimuth of Referring Mark or XLII (Nanmangalam) { by Eastern Elongation	...	...	12	30	5·35
{ by Western „	...	...		„	3·55
Astronomical Azimuth of Nanmangalam by observation, mean of above	...	...	12	30	4·45
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 69—G. *ante*	...	...	12	30	9·29
Astronomical — Geodetical Azimuth at XLIV (St. Thomas's Mount)	...	...	−		4·84

At XLV (Injambákam)

Lat. N. 12° 54′ 51″·18; Long. E. 80° 17′ 38″·41 = 5

February 1880; observed by Lieut.-Colonel B. R. Branfill with Troughton and Simms' 24-inch Theodolite No. 1.

Stars observed	δ Ursæ Minoris (East) and Cephei 51 (Hev.) (West).	
Mean Right Ascension 1880·0	$18^h\ 11^m\ 3^s$	$6^h\ 43^m\ 47^s$
Mean North Polar Distance 1880·0	3° 23′ 27″·65	2° 46′ 15″·05
Local Mean Times of Elongation, February 14	Eastern $14^h\ 37^m$	Western $15^h\ 5^m$

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Feb. 14	E.	48 29 & 228 29	− 84 23 4·66	25 44	− 1 18·68	− 84 24 23·34	− 84 24 6·67	11 20	− 0 15·28	− 84 24 21·95
			23 20·13	22 56	1 2·52	22·65	24 20·35	5 26	0 3·53	23·88
			23 36·56	19 47	0 46·62	23·18	20 44·29	42 47	3 37·95	22·24
			23 19·99	22 55	1 2·56	22·55	20 19·97	45 4	4 1·79	21·76
„ 14	W.	48 29 & 228 29	− 78 5 1·71	1 31	+ 0 0·22	− 78 4 61·49	− 78 5 39·46	20 9	+ 0 39·40	− 78 4 60·06
			5 1·18	0 49	0 0·06	61·12	5 48·64	22 18	0 48·25	60·39
			6 40·58	31 56	1 38·71	61·87	8 26·01	46 15	3 26·62	59 39
			7 9·56	36 23	2 8·06	61·50	9 9·50	50 49	4 9·21	60·29
„ 16	E.	206 53 & 26 53	− 84 22 15·68	32 39	− 2 6·49	− 84 24 22·17	− 84 23 24·28	22 30	− 1 0·15	− 84 24 24·43
			24 19·71	5 2	0 3·03	22·74	23 39·34	19 30	0 45·19	24·53
			24 22·37	2 1	0 0·49	22·86	23 43·27	18 30	0 40·80	24·07
			21 35·70	37 25	2 46·79	22·49	23 24·48	22 9	0 58·48	22·96
„ 16	W.	206 53 & 26 53	− 78 7 10·18	36 35	+ 2 9·92	− 78 4 60·26	− 78 5 31·12	17 19	+ 0 29·16	− 78 4 61·96
			6 14·85	27 17	1 12·29	62·56	5 2·38	2 27	0 0·59	61·79
			5 5·05	5 38	0 3·08	61·97	6 2·87	24 50	0 59·78	63·09
			5 21·55	14 57	0 21·69	59·86	7 9·33	36 26	2 8·47	60·86
„ 18	E.	5 17 & 185 17	− 84 22 41·43	29 30	− 1 43·29	− 84 24 24·72	− 84 24 0·27	14 0	− 0 23·35	− 84 24 23·62
			22 59·91	26 32	1 23·69	23·60	24 10·46	10 39	0 13·52	23·98
			24 24·28	2 18	0 0·63	24·91	22 37·92	29 51	1 46·21	24·13
			24 14·06	9 24	0 10·53	24·59	22 18·60	32 25	2 5·25	23·85
„ 18	W.	5 17 & 185 17	− 78 5 24·03	14 22	+ 0 20·06	− 78 4 63·97	− 78 5 2·47	1 16	+ 0 0·15	− 78 4 62·32
			5 17·60	11 47	0 13·50	64·10	5 8·57	8 3	0 6·30	62·27
			5 38·14	19 5	0 35·33	62·81	6 37·53	31 23	1 35·42	62·11
			5 48·89	21 47	0 46·02	62·87	6 54·02	33 51	1 50·96	63·06

Astronomical Date	Elongation	Zeros (Circle Readings of Referring Mark)	FACE LEFT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE LEFT: Interval in Time from Elongation	FACE LEFT: Reduction in Arc to Time of Elongation	FACE LEFT: Reduced Observation Ref. Mark – Star at Elongation	FACE RIGHT: Observed Horizontal Angle: Diff. of Readings Ref. Mark – Star	FACE RIGHT: Interval in Time from Elongation	FACE RIGHT: Reduction in Arc to Time of Elongation	FACE RIGHT: Reduced Observation Ref. Mark – Star at Elongation
		° ′	° ′ ″	m s	′ ″	° ′ ″	° ′ ″	m s	′ ″	° ′ ″
Feb. 19	E.	127 39	− 84 22 36·26	30 17	− 1 48·93	− 84 24 25·19	− 84 20 18·86	45 29	− 4 5·08	− 84 24 23·94
		&	22 56·90	27 21	1 28·89	25·79	20 54·18	42 6	3 30·12	24·30
		307 39	24 5·18	12 39	0 19·08	24·26	24 20·31	5 19	0 3·37	23·68
			23 43·96	18 19	0 40·02	23·98	24 22·24	2 39	0 0·84	23·08
„ 19	W.	127 39	− 78 9 21·86	51 42	+ 4 19·15	− 78 4 62·71	− 78 7 14·53	36 54	+ 2 12·16	− 78 4 62·37
		&	8 51·47	48 32	3 48·46	63·01	6 13·24	27 2	1 10·96	62·28
		307 39	5 17·77	11 58	0 13·93	63·84	5 5·88	5 2	0 2·46	63·42
			5 6·10	6 56	0 4·68	61·42	5 9·28	7 35	0 5·58	63·70
„ 20	E.	286 5	− 84 22 55·56	27 33	− 1 30·15	− 84 24 25·71	− 84 24 2·68	13 12	− 0 20·73	− 84 24 23·41
		&	23 13·68	24 38	1 12·10	25·78	24 11·62	9 57	0 11·77	23·39
		106 5	24 12·77	10 10	0 12·30	25·07	17 11·78	60 16	7 11·81	23·59
			23 0·65	26 44	1 25·16	25·81	16 12·33	64 16	8 10·81	23·14
„ 20	W.	286 5	− 78 5 14·62	11 6	+ 0 11·95	− 78 4 62·67	− 78 6 53·44	33 44	+ 1 50·47	− 78 4 62·97
		&	5 25·01	14 33	0 20·54	64·47	6 33·71	30 42	1 31·51	62·20
		106 5	8 56·01	48 56	3 51·20	64·81	5 59·43	24 9	0 56·53	62·90
			9 20·23	51 33	4 16·45	63·78	6 19·90	28 15	1 17·32	62·58

Abstract of Astronomical Azimuth observed at XLV (Injambákam) 1880.

1. By Eastern Elongation of δ Ursæ Minoris.

Face	L	R	L	R	L	R	L	R	L	R
Zero	48°	228°	207°	27°	5°	185°	128°	308°	286°	106°
Date	February 14		February 16		February 18		February 19		February 20	
	″	″	″	″	″	″	″	″	″	″
Observed difference of Circle-Readings, Ref. M. — Star reduced to Elongation	23·34	21·95	22·17	24·43	24·72	23·62	25·19	23·94	25·71	23·41
	22·65	23·88	22·74	24·53	23·60	23·98	25·79	24·30	25·78	23·39
	23·18	22·24	22·86	24·07	24·91	24·13	24·26	23·68	25·07	23·59
	22·55	21·76	22·49	22·96	24·59	23·85	23·98	23·08	25·81	23·14
Means	22·93	22·46	22·57	24·00	24·46	23·90	24·81	23·75	25·59	23·38

	February 14	February 16	February 18	February 19	February 20
	° ′ ″	″	″	″	″
Means of both faces	− 84 24 22·70	23·28	24·18	24·28	24·48
Level Corrections	− 0·10	− 0·15	+ 0·13	− 0·09	+ 0·43
Corrected Means	− 84 24 22·80	23·43	24·05	24·37	24·06
Az. of Star fr. S., by W.	183 29 2·67	3·08	3·49	3·70	3·90
Az. of Ref. M. „	99 4 39·87	39·65	39·44	39·33	39·84

Abstract of Astronomical Azimuth observed at XLV (Injambákam) 1880—(*Continued*).

2. By Western Elongation of Cephei 51 (Hev.)

Face	L	R	L	R	L	R	L	R	L	R
Zero	48°	228°	207°	27°	5°	185°	128°	308°	286°	106°
Date	February 14		February 16		February 18		February 19		February 20	
	″	″	″	″	″	″	″	″	″	″
Observed difference	61·49	60·06	60·26	61·96	63·97	62·32	62·71	62·37	62·67	62·97
of Circle-Readings,	61·12	60·39	62·56	61·79	64·10	62·27	63·01	62·28	64·47	62·20
Ref. M. — Star	61·87	59·39	61·97	63·09	62·81	62·11	63·84	63·42	64·81	62·90
reduced to Elongation	61·50	60·29	59·86	60·86	62·87	63·06	61·42	63·70	63·78	62·58
Means	61·50	60·03	61·16	61·93	63·44	62·44	62·75	62·94	63·93	62.66
	° ′ ″		″		″		″		″	
Means of both faces	− 78 4 60·76		61·54		62·94		62·84		63·30	
Level Corrections	− 0·05		− 0·10		+ 0·07		− 0·07		+ 0·35	
Corrected Means	− 78 4 60·81		61·64		62·87		62·91		62·95	
Az. of Star fr. S., by W.	177 9 39·44		39·89		40·34		40·57		40·79	
Az. of Ref. M. „	99 4 38·63		38·25		37·47		37·66		37·84	

		°	′	″
Astronomical Azimuth of Referring Mark or XLII (Nanmangalam)	by Eastern Elongation	99	4	39·63
	by Western „	„		37·97
Astronomical Azimuth of Nanmangalam by observation, mean of above		99	4	38·80
Geodetical Azimuth of „ by calculation from that adopted (Vol. II, page 141) at Kaliánpur, *see page* 69—G. *ante*		99	4	43·92
Astronomical — Geodetical Azimuth at XLV (Injambákam)		−		5·12

W. H. COLE,
In charge of Computing Office.

November, 1889.

PLATE I.

PRINCIPAL TRIANGULATION—MADRAS LONGITUDINAL SERIES.

Fig. No. 72

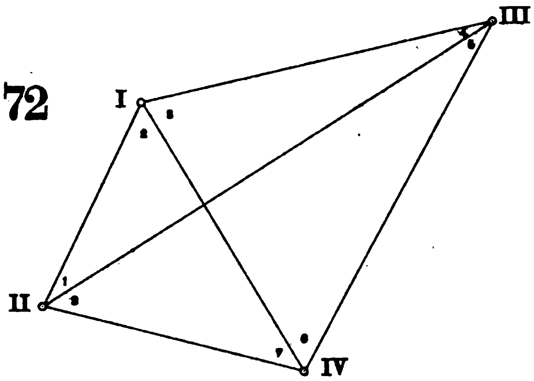


Fig. No. 73

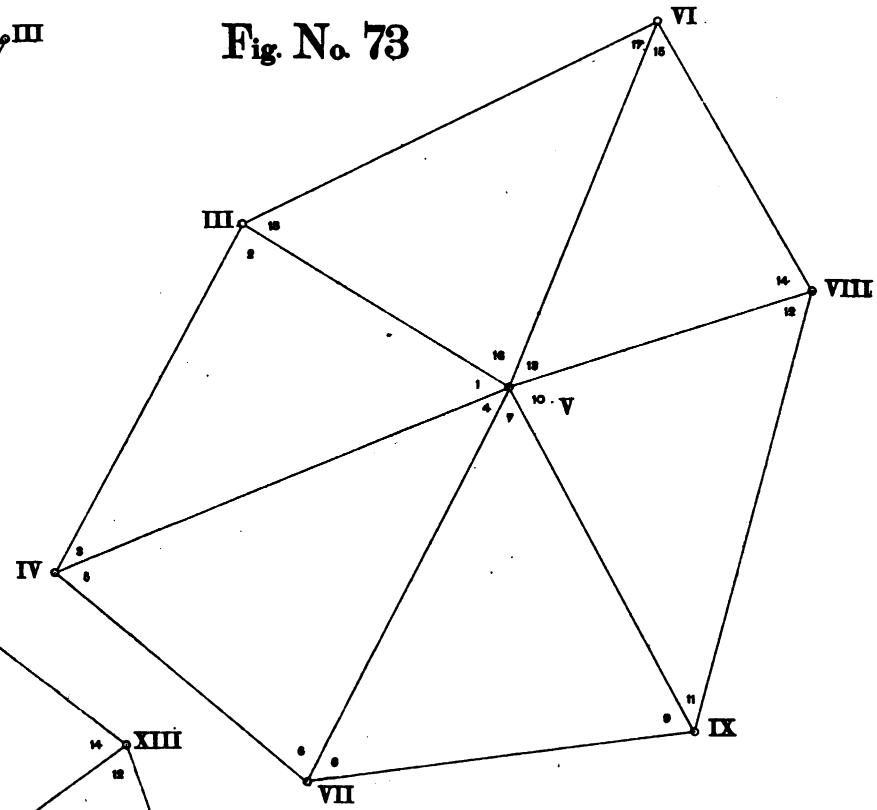


Fig. No. 74

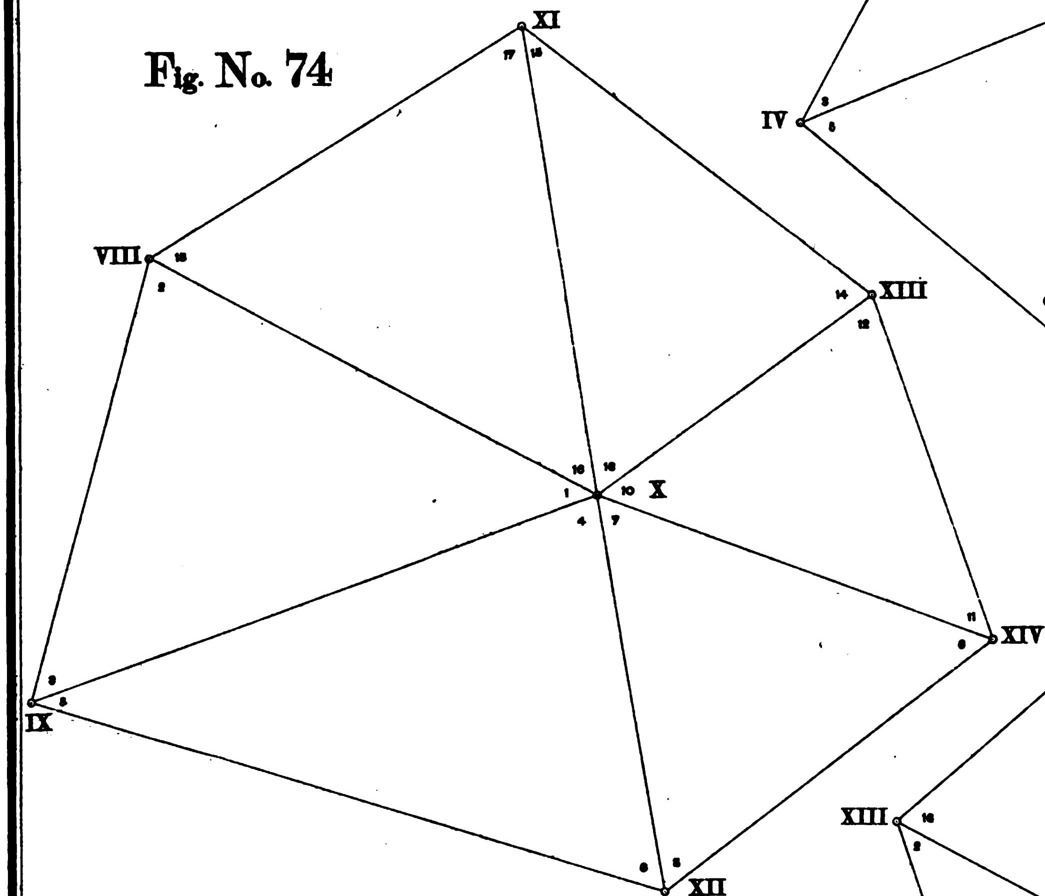


Fig. No. 75

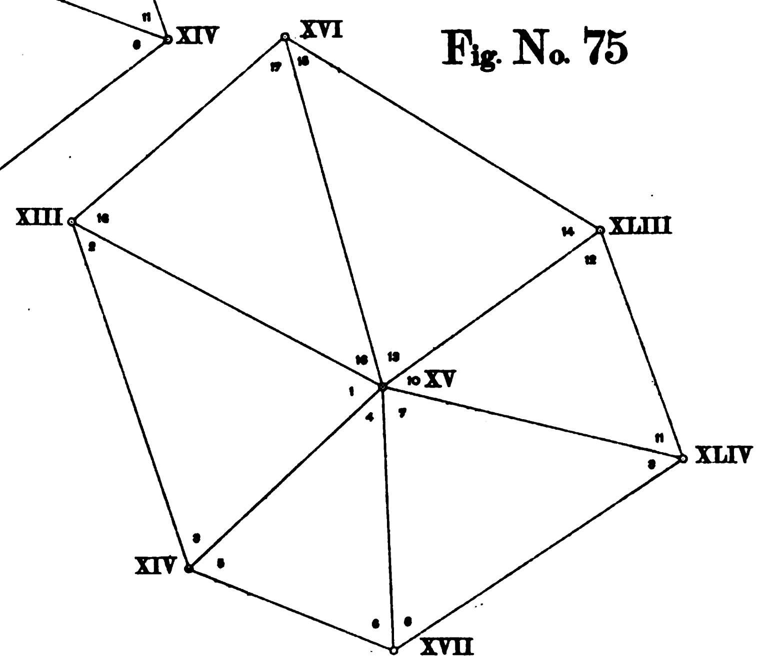
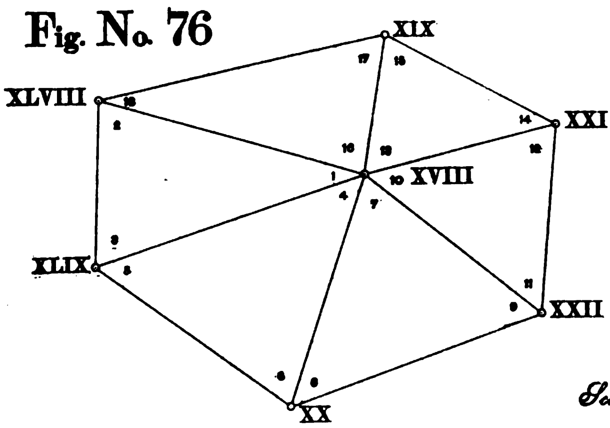


Fig. No. 76



Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, March 1888.

PRINCIPAL TRIANGULATION—MADRAS LONGITUDINAL SERIES.

Fig. No. 77

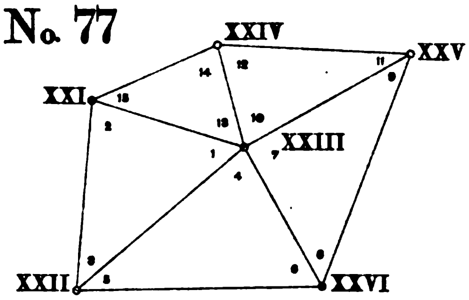


Fig. No. 78

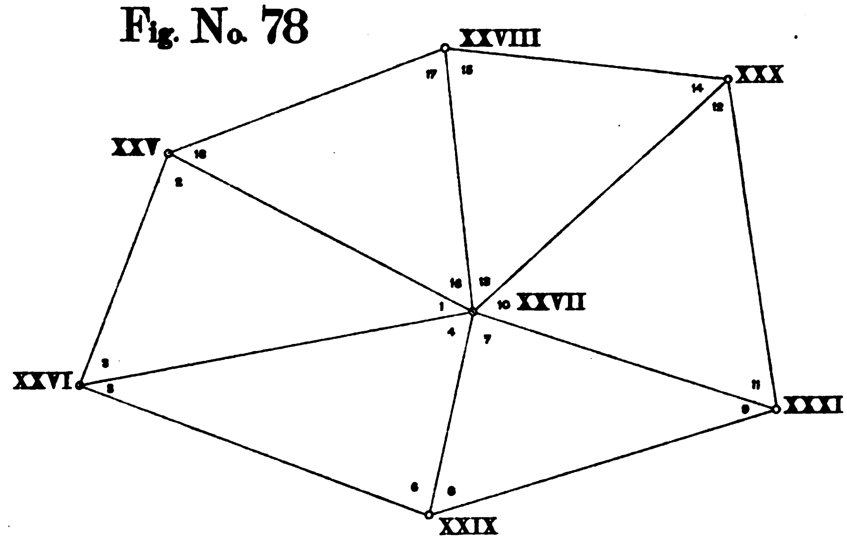


Fig. No. 79

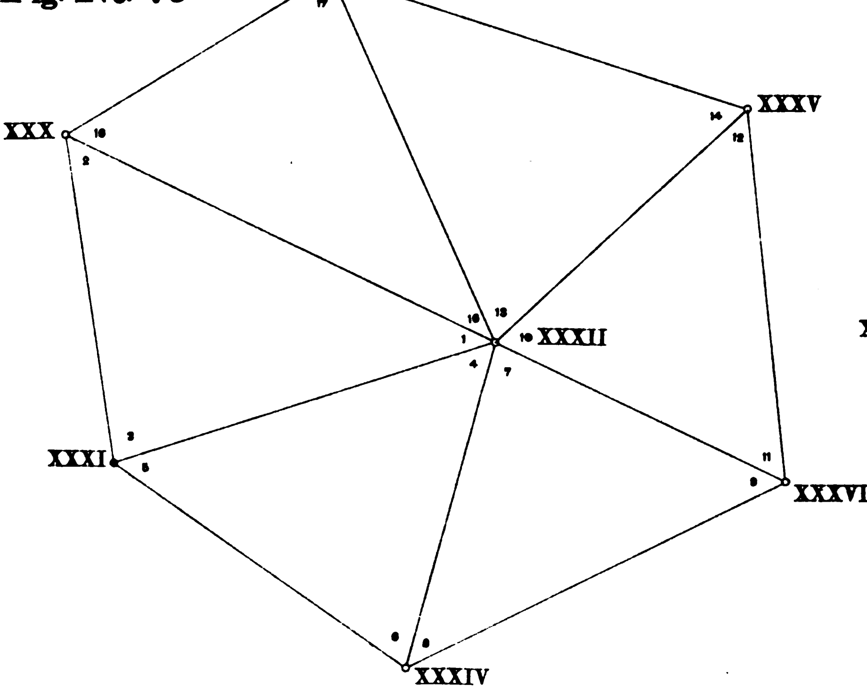
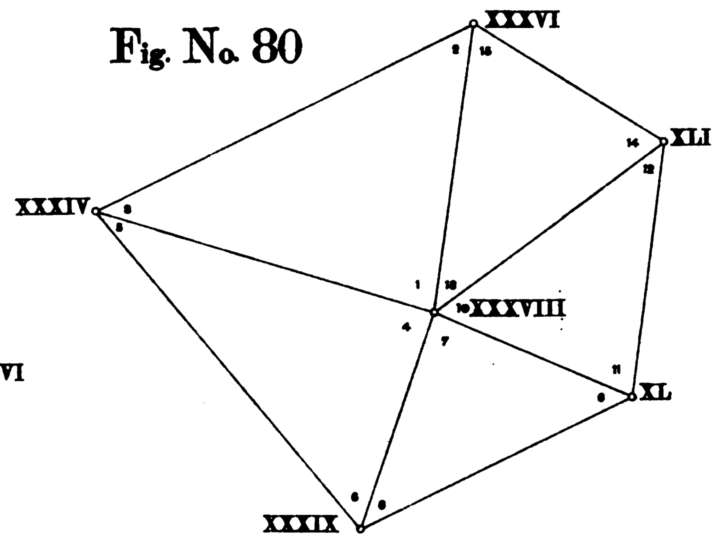


Fig. No. 80



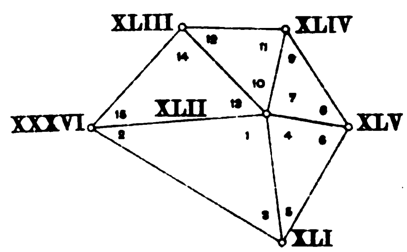


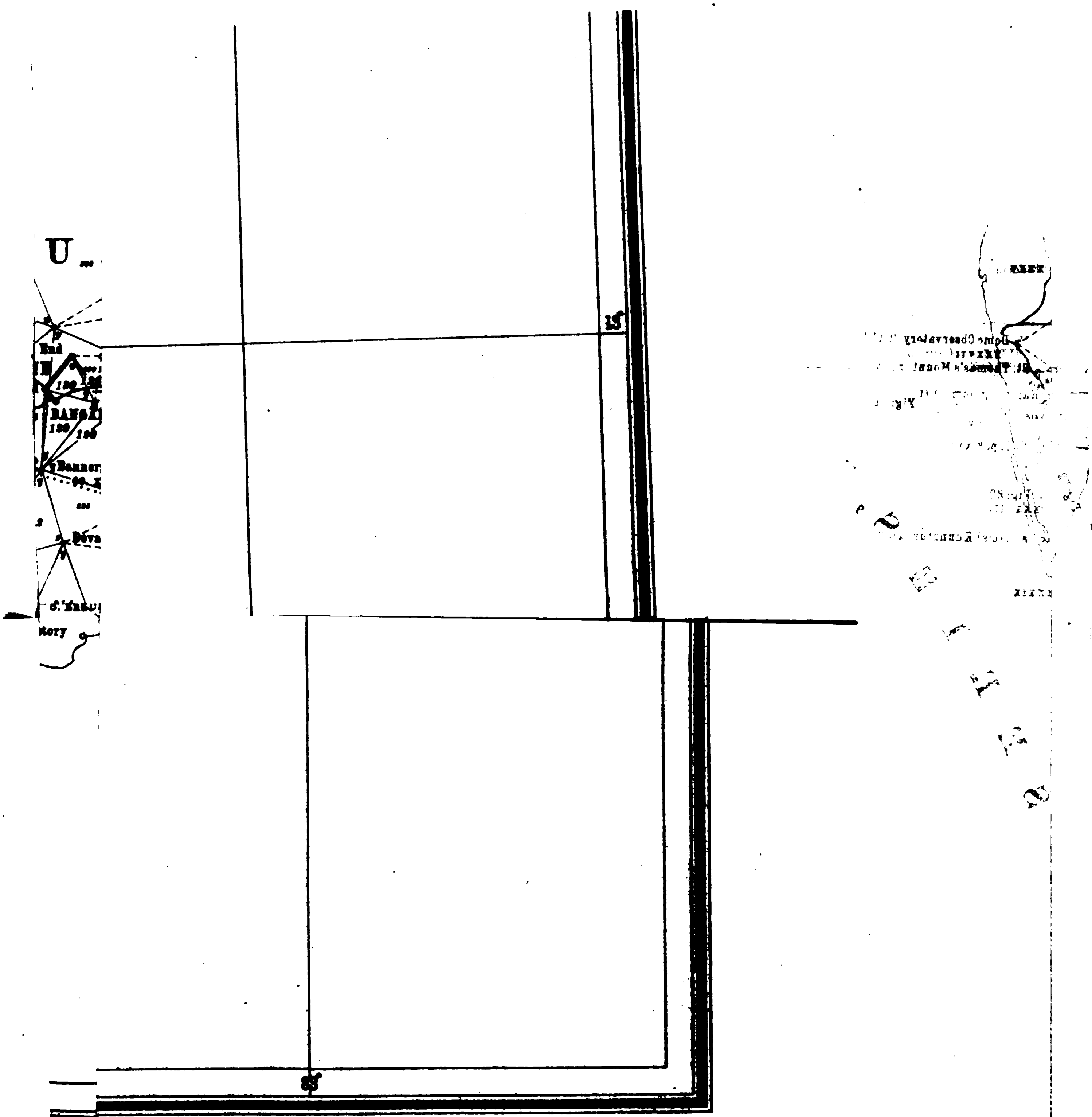
Fig. No. 81

Scale 1 Inch = 12 Miles or $\frac{1}{760320}$

Photozincographed at the Office of the Trigonometrical Branch, Survey of India, Dehra Dún, March 1888.

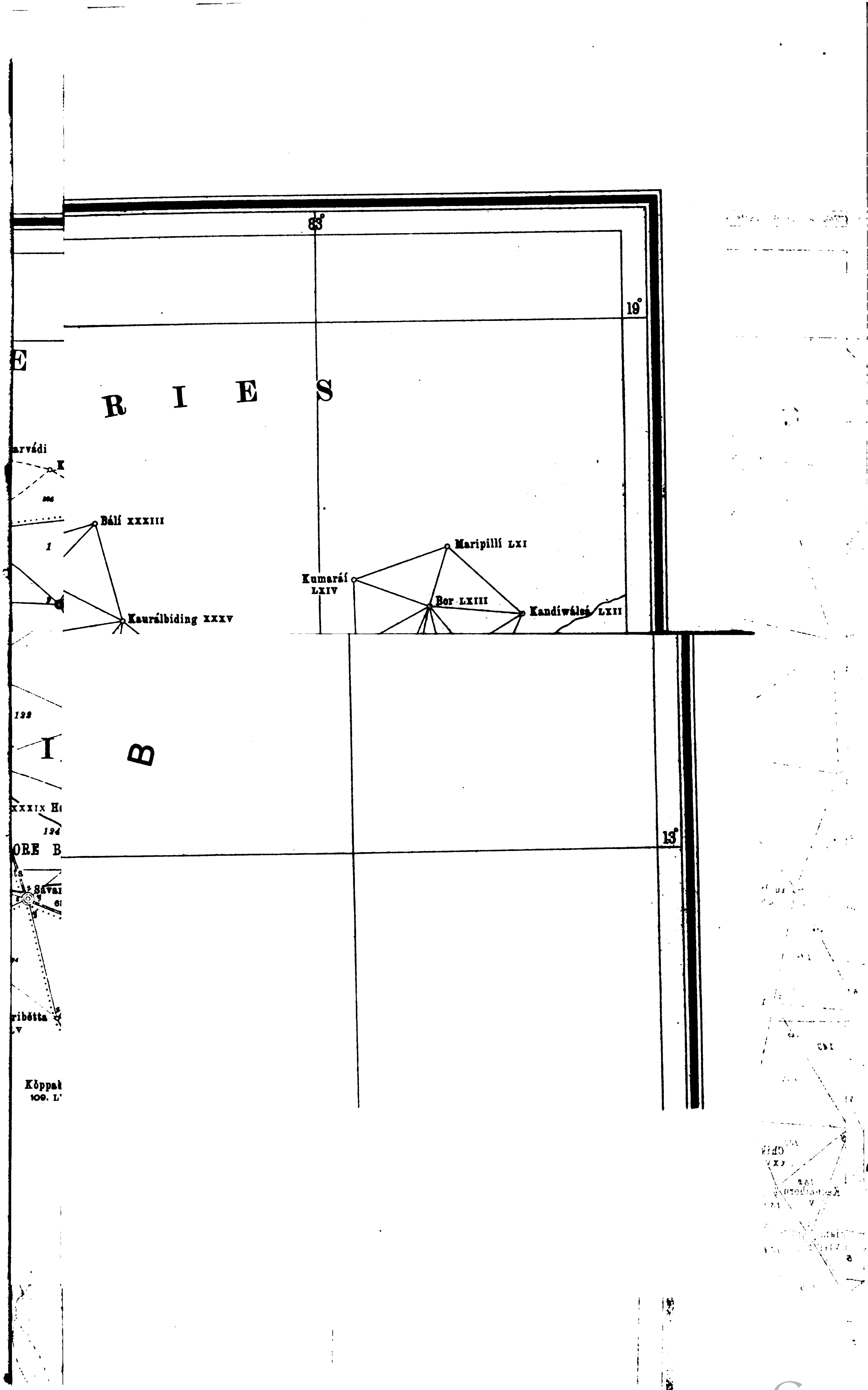

REDUCTION CHART
OF THE
PRINCIPAL TRIANGULATION
OF
THE SOUTHERN TRIGON
OF THE
GREAT TRIGONOMETRICAL SURVEY
OF
INDIA
Scale 1 Inch = 32 miles
COMPRISING THE FOLLOWING SERIES
A. GREAT ARC MERIDIONAL 8° TO 13°
B. BOMBAY LONGITUDINAL
C. SOUTH KONKAN COAST
D. MANGALORE MERIDIONAL
E. MADRAS MERIDIONAL AND COAST
F. SOUTH-EAST COAST
G. MADRAS LONGITUDINAL
MADRAS LONGITUDINAL SERIES, G
GREAT ARC MERIDIONAL
SOUTH-EAST COAST SERIES, F
CEYLON BRANCH SERIES
BANGALORE BASE-LINE
CAPE COMORIN BASE-LINE
Cape Comorin Base-Line Figure
ARABIAN SEA
BAY OF BENGAL
MANGALORE
CANNANORE
CALICUT
BEYPORE
PONANI
COCHIN
ALLEPPI
QUILON
TRIVANDRUM
MYSORE
BANGALORE
SALEM
ERODE
COIMBATORE
TRICHINOPOLY
TANJORE
NEGAPATAM
PONDICHERRY
MADRAS
ARCOT
JALARPET
MADURA
TINNEVELLY
TUTICORIN

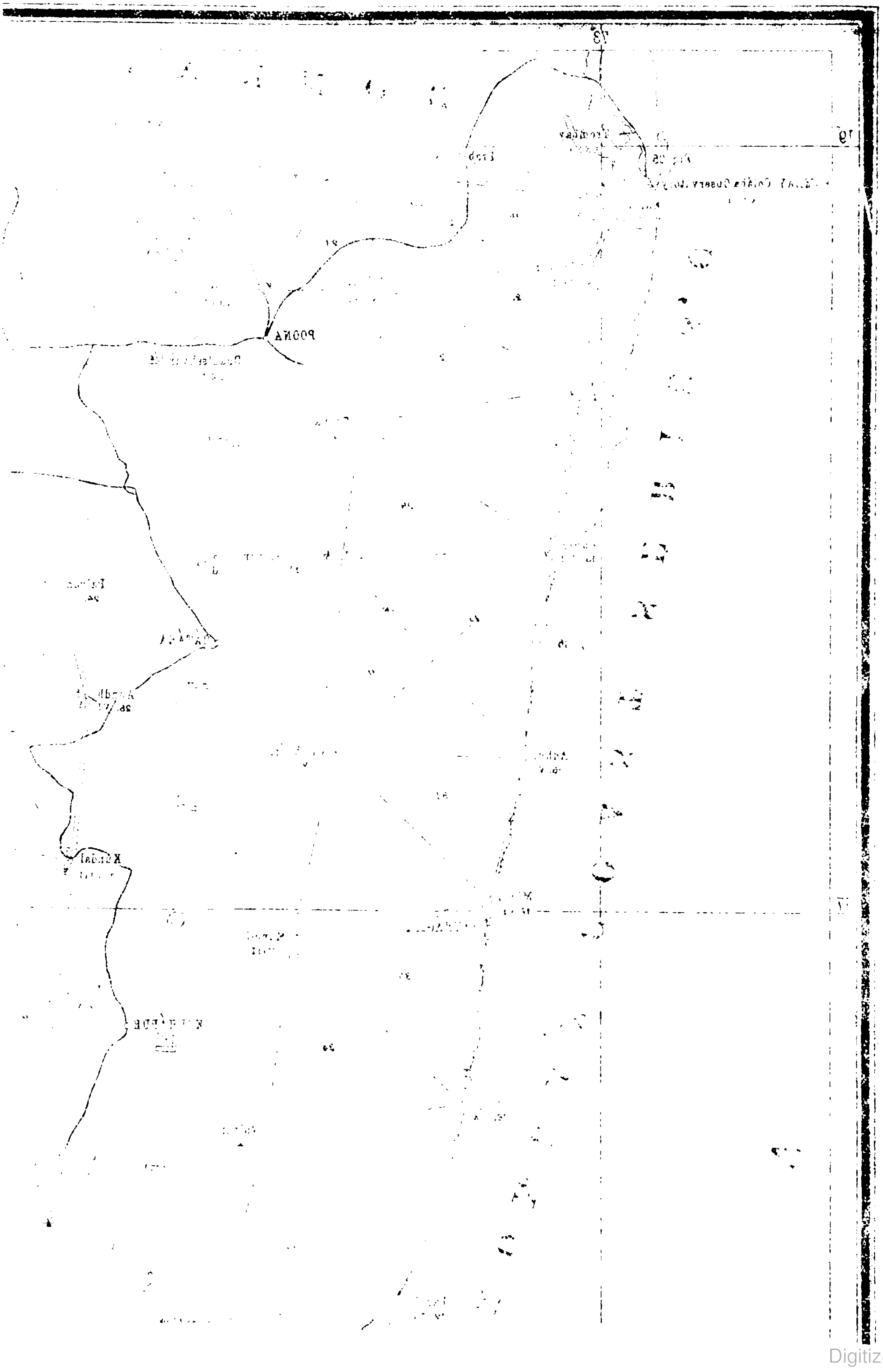

BOMBAY LONGITUDINAL SERIES, B
BIDER LONGITUDINAL SERIES
MADRAS LONGITUDINAL SERIES, G
SOUTH KONKAN COAST SERIES, C
MANGALORE MERIDIONAL SERIES, D
MADRAS MERIDIONAL & COAST SERIES, E
CIRCUIT
BIDER BASE-LINE
BANGALORE BASE-LINE
VIZAGAPATAM BASE-LINE
BOMBAY
POONA
SHOLAPUR
GULBARGA
HYDERABAD
BIJĀPUR
KOLHĀPUR
BELGAUM
DHARWAR
BELLARY
KURNOOL
CUDDAPAH
NELLORE
MADRAS
BANGALORE
MANGALORE
HASSAN
ARCOT
VIZAGAPATAM
COCANADA
RAJAHMUNDRY
MASULIPATAM
GUNTUR
A R A B I A
B E N G A L



Photozincographed at the Trigonometrical Branch, Survey of India Office, Dehra Dún.

he dir


83°
19°
R I E S
Bálí XXXIII
Kaurálbiding XXXV
Kumaráí LXIV
Maripillí LXI
Bor LXIII
Kandíwálsé LXII
B
13°
ribétta



List of Published Works of the Great Trigonometrical Survey of India.

An Account of the Measurement of an Arc of the meridian between the parallels of 18° 3′ and 24° 7′, being a continuation of the Grand Meridional Arc of India as detailed by the late Lieutenant-Colonel Lambton in the Volumes of the Asiatic Society of Calcutta. By Captain George Everest, of the Bengal Artillery, F.R.S., &c. London, 1830. (*Out of print*).

An Account of the Measurement of two Sections of the Meridional Arc of India, bounded by the parallels 18° 3′ 5″; 24° 7′ 11″; and 29° 30′ 18″. By Lieutenant-Colonel Everest, F.R.S., &c., late Surveyor General of India, and his Assistants. London, 1847. (*Out of print*).

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Do. VII. General Description of the Principal Triangulation of the North-East Quadrilateral, including the Simultaneous Reduction and the Details of five of the component Series, the North-East Longitudinal, the Budhon Meridional, the Rangír Meridional, the Amua Meridional, and the Karára Meridional. Prepared under the directions of Lieutenant-General J. T. Walker, C.B., R.E., F.R.S., &c., &c., Surveyor General of India and Superintendent of the Trigonometrical Survey. Dehra Dún, 1882.

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Do. XIIIA. The South Párasnáth Meridional Series and the South Malúncha Meridional Series of the South-East Quadrilateral. Prepared in the Office of the Trigonometrical Branch, Survey of India, Colonel C. T. Haig, R.E., Offg. Deputy Surveyor General, in charge, and published under the orders of Colonel G. C. DePrée, S.C., Surveyor General of India. Dehra Dún, 1885.

Synopses of the Results of the G. T. Survey of India, &c.—(*Continued*).

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