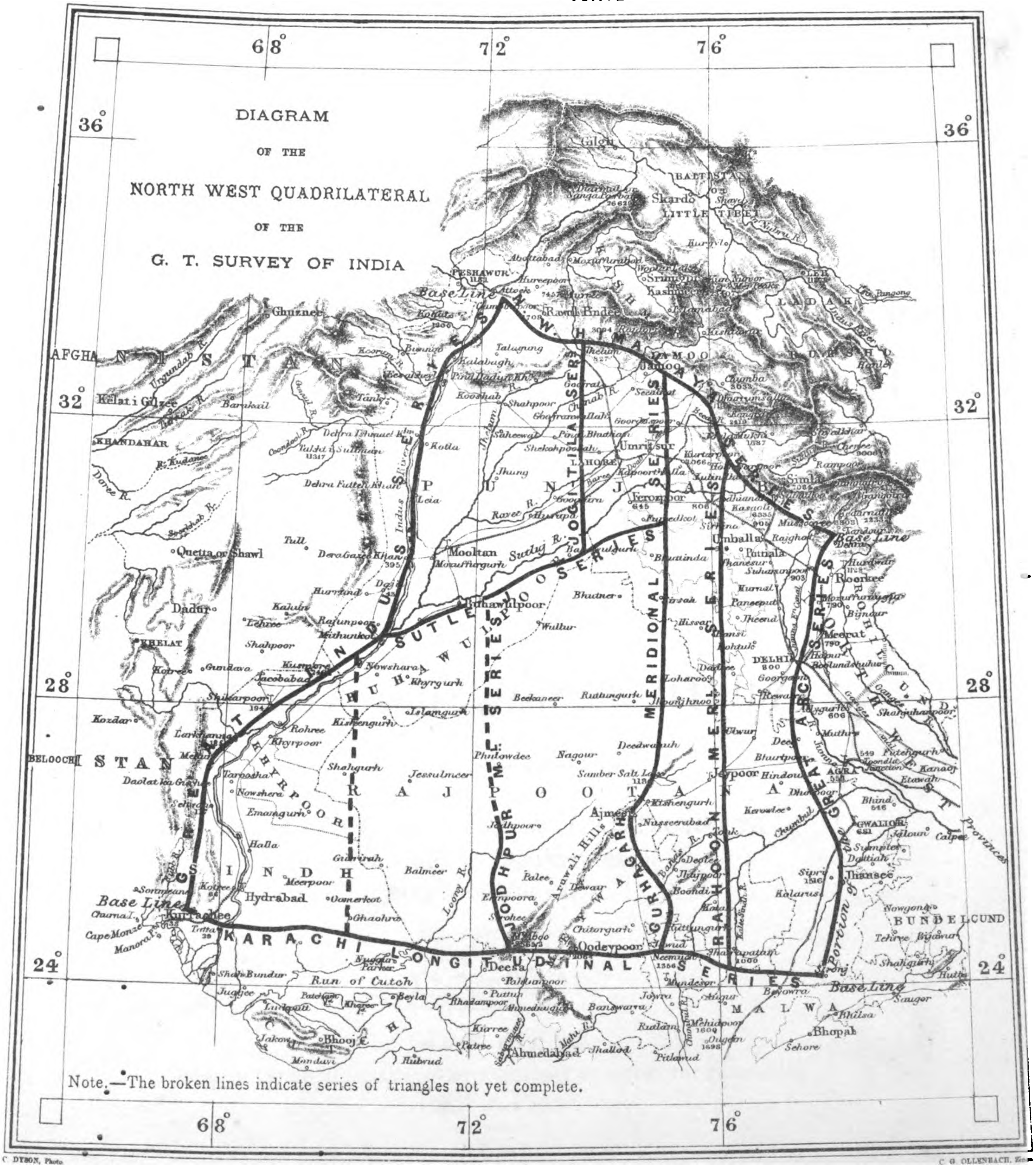
GREAT TRIGONOMETRICAL SURVEY OF INDIA.



C. DYSON, Photo. C. G. OLLENBACH, Eng.

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SYNOPSIS OF THE RESULTS OF THE OPERATIONS OF

THE GREAT TRIGONOMETRICAL SURVEY OF INDIA

VOLUME VI.

DESCRIPTIONS AND CO-ORDINATES

OF THE

PRINCIPAL AND SECONDARY STATIONS AND OTHER FIXED POINTS OF

THE JOGI-TILA MERIDIONAL SERIES

OR SERIES G

AND THE SUTLEJ SERIES

OR SERIES H

OF THE

NORTH-WEST QUADRILATERAL.

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

Dehra Dun:
PRINTED AT THE OFFICE OF THE GREAT TRIGONOMETRICAL SURVEY OF INDIA.
M. J. O'CONNOR.

1875.

CONTENTS.

JOGÍ-TÍLÁ MERIDIONAL SERIES.

SUTLEJ SERIES.

SUTLEJ SERIES—(Continued).

Page							
1—*G.*	*in some copies*, line	8 from top,	*for*	Moní-dhaí	*read*	Moní-Dhai	
„	„	„ 14 „	„	Kajkot	„	Kájkot	
„	„	„ 22 „	„	Búralá	„	Búrála	
3—*G.*	„	„ 1 „	„	Mámú-deh	„	Mámúdeh	
4—*G.*	„	„ 12 „	*after*	30·19	*add*	feet	
9—*G.*	„	„ 22 „	*for*	Shivála	*read*	Shivala	
„	„	„ 26 „	„	Rawul Pind	„	Ráwul Pindi	
34—*G.*	col. 3,		*after*	line 16 from top,	*insert*	Checháwatní Chimney, (*Gogairá*) Of Staging Bungalow. λ 30° 34′ 10″·2 L 72 43 41·4	
36—*G.*	„ 1,		„	„ 16 „	„	Harappá Tahsíl. (*Gogairá*) λ 30 37 40 L 72 54 44	
37—*G.*	„ 1,		*at bottom*		„	Kálká-ká-Bher. (*Multán*) λ 30 30 15 L 72 4 33	
„	„ 3,		*after*	line 17 from top,	„	H 1747	
38—*G.*	„ 1,		„	„ 20 „	„	Mádhowálí Chimney. (*Gogairá*) Of Railway Station house. λ 30 35 59·9 L 72 56 48·9	
„	„ 2,		„	„ 5 „	„	Makhdúmpúr Sarái. (*Multán*) λ 30 27 32·3 L 72 5 2·5	
„	„ 2,		„	„ 37 „	„	Mámúsher Dome. (*Multán*) λ 30 30 6 L 72 16 41	
42—*G.*	„ 3,		„	„ 21 „	„	Tulalambá Flag. (*Multán*) λ 30 31 39 L 72 16 52	
1—*H.*	*in some copies*, col. 2, line	17 from top,					
2—*H.*	„	„ „ 11 „	*for*	Moní-dhai	*read*	Moní-Dhai	
7—*H.*	„	„ 12 „					

REFERENCES.

The Principal Stations of this Survey, when on hills or high mounds, consist of circular masonry pillars from 3 to 4 feet in diameter for the large theodolites to rest on, surrounded by a platform from 12 to 16 feet square on which the observatory tent was pitched. Being invariably placed on the highest accessible points, they rarely required to be raised more than 3 or 4 feet. When in the plains, and mounds were not available, towers had to be built, consisting of a central masonry pillar, surrounded by a mass of sun-dried bricks to the level of its surface, for the observatory tent to rest on. The pillars were perforated and mark-stones were permanently placed in the basement, and access was obtained to the ground level mark by a passage constructed for the purpose.

The abbreviations employed in the text and on the chart at the end of each series are as follows :—

H.S.	denotes	Hill Station (Principal)
T.S.	,,	Tower ,, ,,
h.s.	,,	hill station (secondary)
t.s.	,,	tower ,, ,,
s.	,,	station (secondary)

The last three abbreviations are only placed after stations where a theodolite has been set up and observations taken to surrounding stations.

The name in italics in the Alphabetical Lists commencing on pages 33—$_G$ and 47—$_H$, is that of the district in which the point is situated.

The latitudes and longitudes of all points shown on the chart at the end of each series will be found in the text. Where continuous lines are drawn connecting them the distances and reciprocal azimuths will also be found; where no such lines exist these elements are not given. In cases where half the line is dotted, it is to be understood that the point at the extremity of the dotted half was observed to, but that reciprocal observations were not taken. When no observations at all have been taken from a point, the azimuths of the surrounding points are not given.

W. H. COLE.

November 1875.

PREFACE.

THE Jogí-Tílá Meridional Series and the Sutlej Series constitute two of the internal chains of that considerable portion of the Principal Triangulation of the Survey of India which is known as the North-West Quadrilateral, and embraces the area lying to the north of a line running westwards from Sironj (in Central India) to Karáchi (Kurrachee), and included between the British Frontier-lines on the west and north and a line running from Sironj up to the Himalayas on the east. With the exception of two comparatively short chains of triangles across the deserts of Sind and Rájputána, the whole of the principal triangulation of this Quadrilateral was completed by the year 1866; the base-lines at its four corners, namely Sironj, Dehra Dún, Chach and Karáchi, on which the linear elements are dependent, had been completed several years previously. As it was then known that many years would elapse before the two remaining chains of triangles could be undertaken, and as the base-lines and the four external and all the more immediately important internal chains had been finished, the final reduction of the Quadrilateral was commenced without waiting for the completion of the entire figure. The general principles and procedure of the reduction will be explained in Volume II of the "*Account of the Operations of the Great Trigonometrical Survey*" which is now in preparation, and full details of the whole of the principal triangulation at present included in the Quadrilateral will be found in Volumes III and IV, which have been printed but await publication until the completion of Volume II.

As however the whole of the contents of those volumes will not be needed by geographers and surveyors, and moreover as the volumes gave no details of the secondary triangulation—which is of considerable value for local requirements—it was obviously desirable that Synopses of the final results of the whole of the operations, including the secondary as well as the principal triangulations, should be prepared for general use in such a manner as to be most suitable for convenience of reference. This has already been done for several of the series, the following Synoptical Volumes having been published,

I. The Great Indus Series.
II. The Great Arc, Section 24° to 30°.
III. Karáchi Longitudinal Series.
IV. The Gurhágarh Meridional Series.
V. The Rahún Meridional Series.

The present is the 6th of the Synoptical Volumes; and it has been made to include both the Jogí-Tílá and the Sutlej Series, partly because portions of the same Districts enter both series and it is therefore convenient to have all the results in one volume, and partly because the available matter is insufficient for two volumes.

It gives the results of the whole of the triangulation executed in connection with these series, both the principal—or that executed with the great theodolites, having azimuthal circles of 24 to 36 inches in diameter which are read by micrometer-microscopes—and the secondary, executed by smaller theodolites with circles of 6 to 14 inches in diameter which are read by verniers.

By the process of reduction which has been already mentioned the principal triangulation has been

rendered perfectly consistent, both internally and externally; internally, so that if in any one of the several polygonal figures of which the chain is composed, calculations are carried from one station to another in every possible direction, the same results will be inevitably deduced; and externally, so that the values of the co-ordinates of any station when computed from the given co-ordinates of any other station, with the final linear and angular data, will be the same, whether the calculation is carried directly through the series or circuitously through any of the other chains of triangles comprising the North-West Quadrilateral. All secondary triangulations which emanate from one side of the principal series and close on another side thereof, or on a contiguous series, have also been made consistent throughout.

As regards the general arrangement of this volume it is necessary to point out that the several sections have been prepared and printed at different times, and that the work has extended over several years. The Introductions to each series and the Names and Descriptions of the Principal Stations, were originally prepared for Volume IV of the "*Account of the Operations &c.,*" and when a sufficient number of copies had been printed for that work additional copies were struck off for the present synopsis. The Names and Descriptions of the Principal Stations, pages 1_{G} to 10_{G} and 1_{H} to 9_{H}, were printed first of all; this was done in the year 1865 after a general programme had been drawn up for the reduction of the North-West Quadrilateral; there was then a long pause in the printing, while the reduction of the principal triangulation was being completed; finally the secondary triangulation had to be adjusted into accordance with the principal, and then the printing was resumed.

The paging of each series starts from unity and is therefore not continuous throughout this volume. This was necessitated by the order of routine which had to be adopted in printing the successive subjects embraced in each and which is the same for all. The paging of each series is however distinguished by using a capital letter as a subscript to the numerals; thus all the paging which has reference to the Jogí-Tílá Series has the subscript *G*, and that to the Sutlej Series the subscript *H*.

The data given in this volume are the following:—

First (pages 1_{G}, 1_{H}), alphabetical lists of the names of the principal stations, showing the numbers assigned to each which were employed in the reductions as being more convenient to use than names.

Second (pages 2_{G}, 2_{H}), numerical lists giving the names corresponding to the numbers.

Third (pages 3_{G}, 3_{H}), descriptions of the principal stations—of their structure and positions—as taken from the original records of the observations, and supplemented by addenda giving the most recent information of their condition which has been received up to date.

Fourth (pages 11_{G}, 9_{H}), the angles and sides of the principal triangles, numbered and arranged in order from south to north for the Jogí-Tílá and from east to west for the Sutlej Series.

Fifth (pages 15_{G}, 12_{H}), the latitudes, longitudes and heights of the principal stations, arranged numerically, and the azimuths at each station of the surrounding ones; also descriptions of the points on which the leveling staves were set up at stations whose heights were determined by spirit-leveling operations.

Sixth (pages 19_{G}, 17_{H}), the angles and sides of certain secondary triangles; the numbering is here made consecutive to that of the principal triangles, in order to facilitate references which are made in other sections to the place where the length of a side is to be found.

Seventh (pages 28_{G}, 37_{H}), the azimuths of surrounding points at the principal, the principal-auxiliary* and the secondary stations, arranged in alphabetical order.

Eighth (pages 33_{G}, 47_{H}), the co-ordinates and descriptions of all stations and points, arranged in alphabetical order.

* Note, by a principal-auxiliary station is meant a station auxiliary to a principal station at which observations were taken to fix unvisited points.

The heights depend on the line of levels which was carried from the tidal station of Manora, at Karáchi (Kurrachee) through the valley of the Indus to Mithankot, and then along the left bank of the Sutlej to Ferozepore, &c., and is described in the introduction to the "*Tables of Heights in Sind, the Punjab &c., Calcutta,* 1863." All other heights were determined differentially, by the method of vertical angles, with reference to the nearest stations whose heights had been fixed by the spirit-leveling operations. Reciprocal vertical angles were measured at the whole of the principal stations. All heights determined by spirit-leveling are given to two places of decimals of a foot; the other heights, being in great measure dependent on the triangulation, are given to the nearest foot only.

It has not been considered necessary to publish the whole of the details of the secondary triangulation; the sides and angles of 620 triangles, which were selected as most likely to be of general use, and the azimuths of all these sides, have been given; but for a considerable number of other points the co-ordinates only have been given. With the aid of Nos. X, XI, and XII of the "*Auxiliary Tables to facilitate calculations of the Survey Department of India, Dehra Doon,* 1868," local surveyors, working on a system of rectangular co-ordinates, can readily transform the spheroidal co-ordinates here given to suit their own requirements.

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

All the values of longitude in this volume require a constant correction, probably of −3′.

As regards the Orthography of Indian names, I am sorry to have to state that it has not been possible to adopt a uniform system throughout the present volume. Many years ago Colonel Everest endeavoured to bring into general use in the Survey Department Sir William Jones's method, which is at once elegant and phonical, and is highly approved of by scientific men. But that method gives to all vowels their Italian sounds; and as the differences between the English and the Italian sounds are, in almost every instance, very considerable, and it is easier to lay down rules than to find followers for them, the surveyors gradually got into the way of using *ee* for the Italian *i* and *oo* for the Italian *u*, and of spelling generally in the manner that is natural to most Englishmen. In 1865, when the preparation of the final results was commenced, the spellings were corrected in accordance with Sir William Jones's system, excepting in the case of well-known names—such as Meerut, Calcutta, Cawnpore—which had become settled and familiar by long use and which it would have been pedantic to alter. But in 1871 the Government of India made arrangements for the introduction of a uniform system of spelling throughout India, and circulated a "*Guide to the Orthography of Indian Proper Names, with a list showing the true spelling of Post-towns in India,*" which was prepared by Dr. W. W. Hunter, *L.L.D.*, Director General of Statistics to the Government of India; the guide was sent to this Department with instructions that the directions it contained should be immediately complied with. Dr. Hunter's rules for spelling unfamiliar names, not given in his list of post-towns, are very similar to the rules which had been adopted in this Department, the chief difference being that the long *a*, *i* and *u* are required to be frequently un-accented, whereas by our rules they are invariably accented. In his list of post-towns however Dr. Hunter has not followed a uniform system of spelling, but has effected a compromise which—in his own words—"by sacrificing something in scientific precision, obtains a spelling more accurate than at present and yet recognizable as the same name." Thus the hill station at which the Head Quarters of this Survey are located, during the summer months, is spelt ordinarily Mussoorie and scientifically Masúri, but according to Dr. Hunter it should be spelt Masauri. In September 1873 the Government of India is-

sued amended rules for the spelling of all names not well known, which are practically identical with those originally followed in this Department. At the same time it was ordered that the orthography of the well-known names should be retained, and that a list of all note-worthy names should be prepared, in each Province, showing the orthography to be uniformly followed in future official correspondence and publications. When these lists are published, uniformity of spelling will become possible; to what extent uniformity of system will be secured will depend on the latitude taken by the compilers of the lists in defining the number of names which are to be considered as well-known; and this is a point on which considerable differences of opinion are known to exist; some of the lists already published are eminently conservative of the old fashioned anglicized spellings, while in others the names which remain unchanged bear but a very small proportion to those which have been altered.

Certain portions of the present volume having been printed before, and others after, the issue of the several orders above quoted, the attempts to introduce a uniform system of orthography have occasionally led to considerable diversities of spelling, and in not a few instances to the adoption of one spelling, then of another, and finally the return to the first; as in Dún, Doon, and finally, Dún,—or Cutch, Katch, Kach'h, and finally Cutch; or to successive divergencies from the first spelling, as Masúrí, Masauri, Mussoorie, and finally Mussooree. It is however hoped that, notwithstanding such departures from a standard spelling, of which there are several instances, all the names will be recognizable. As a general rule the pronunciations of the vowels are as follow; *a* has a variable sound as in wom*a*n, rur*a*l, p*a*ltry; *á* as in t*a*rtan; *i* as in b*i*t; *í* as in rav*i*ne; *u* as in b*u*ll; *ú* as in r*u*ral; *o* as in n*o*te; *e* as *a* in s*a*y; *au* as *ou* in cl*ou*d; *ai* as *i* in r*i*de.

The Charts accompanying this volume show the whole of the principal stations and triangulation, the positions of all the secondary points and the portions of the secondary triangulation of which full details of the angles, sides and azimuths are given. With the aid of these Charts it is hoped that little difficulty will be met with in finding out any of the data contained in the volume which may be required. I must acknowledge with regret that the descriptions of the secondary stations are in some cases not as full and clear as is to be desired; this arises from the inadequacy of the information entered on the spot by the surveyors, in their field books; every effort has been made to supplement the information given by the surveyors, whenever it was practicable to do so, in order to facilitate the future identification of the stations, and all the information which is at present forthcoming in this office has been given.

The general arrangement of this volume and the preparation of the data which it contains are due in great measure to J. B. N. Hennessey, Esq., F.R.S., Deputy Superintendent 1st Grade, in charge of the Computing Office, who has taken great pains to secure the utmost possible accuracy in preparing the data and passing them through the press.

MUSSOOREE,
November 1875.

J. T. WALKER, COLONEL, R.E.,
Supdt. Great Trigonometrical Survey of India.

JOGI-TILA MERIDIONAL SERIES.

THE JOGI-TILA MERIDIONAL SERIES.

INTRODUCTION

This Series is a meridional chain of triangles appertaining to the great trigonometrical figure known as the North-West Quadrilateral, of which a diagram is given in the frontispiece to this volume. It covers the portion of the meridian of 73°½ which is included between the North-West Himalaya and the Sutlej Series. It was carried out during the years 1853 to 1857.

The designation of the Series is derived from that of one of the peaks of the Salt Range, which lies between the Indus and the Jhelum Rivers, and forms the boundary between the elevated plateau of the Ráwal Pindi District and the plains of the Sindh Ságar Doáb. The highest peak at the eastern end of this range is known far and wide as the Jogí-Tílá; on its summit there are two Hindu temples which are considered of peculiar sanctity, and there are also various buildings which are inhabited by the Jogís who conduct the religious services. This peak was first utilized in the operations of the Survey as a station of the North-West Himalayan triangulation, and afterwards its meridian and name were adopted by Colonel Waugh for the present Series of triangles, in conformity with a custom which had originated with Colonel Everest in selecting and naming the meridional chains that emanate from the Calcutta Longitudinal Series; see Section 3, Chapter I, Vol. II of the *Account of the Operations of the Great Trigonometrical Survey of India.*

The northern portion of the present triangulation lies in the Salt Range and in the hill tracts between that range and the Himalayas. Under ordinary circumstances it would have emanated from a side on the southern flank of the North-West Himalaya Series; but the configuration of the ground rendered this impossible, and necessitated the adoption of one of the central sides of the Jáolí polygon as the side of origin, and thus the first polygonal figure covers a good deal of the ground which had already been occupied by the North-West Himalaya Series.

The whole of the triangulation to the south lies in the plains of the Punjab. The Series alights on these plains immediately after passing over the River Jhelum; it then crosses obliquely over the Jech and the Rachna Doábs—whose names are formed by combining the first letters of the rivers Jhelum, Chenab and Ravi, between which they are respectively situated—and utilizes as stations the three isolated hills of Chiniout, Sángla and Shá-Kot which are situated in the latter Doáb, and are, with a single exception, the only hills met with in the plains of the Punjab; and finally it crosses the Bári Doáb and the Sutlej River, and then closes on the Sutlej Series, though originally it had been intended to be carried down through Rajputána, and to close on the Kurrachee (Karáchi) Longitudinal Series.

The usual preliminaries of selecting and building stations—see Chapter II, Vol. II—were commenced, under instructions from Colonel Waugh, during the field season of 1853-54, by Mr. J. W. Armstrong and one Assistant, aided by half the ordinary native establishment of a trigonometrical party, the other half being employed with Lieutenant J. T. Walker of the Bombay Engineers in the measurement of the Chach base-line. Mr. Armstrong selected the several hill stations and the three first stations in the plains, and built pillars at the former and towers at the latter. After the completion of the Chach base-line, Lieutenant Walker arrived and made a reconnoissance of the country in advance, drew up a design for the triangulation down to the hills of Chiniout and Shá-Kot, and then returned to the Head Quarters at Dehra Dún.

Season 1853-54.

PERSONNEL.

J. W. Armstrong, Esq.
Mr. J. P. Dunlop, Sub-Assistant.

In the following field season Lieutenant Walker was placed in charge of the operations. He received a letter of instructions from Colonel Waugh from which the following extracts are given, with a view to indicate the general scope of the operations, and the attention to minute details which characterizes all the letters of instruction issued by Colonel Waugh to his Officers.

Season 1854-55.

PERSONNEL.

Lieut. J. T. Walker, R.E.
Mr. G. Shelverton, Sub-Assistant.
Mr. E. T. Donnelly, „
Mr. W. Dyer, „

"Your party has been successively employed on the Gora and Hurilaong Meridional Series for which "special instructions were issued. These you will find among the records which accompany your party. "The first contains the authority under which your party was originally constituted, and both furnish "general heads of instructions for the conduct of a Meridional Series of Great Triangles. On the 27th "October 1853 a Memo. of instructions was likewise issued to Mr. Armstrong for laying out an approximate "series on the Jogí-Tílá meridian.

"In addition to the foregoing documents you are also duly supplied with a copy of my manuscript paper "on Trigonometrical Operations in which are contained minute instructions for the adjustment and use of the "Great Theodolite. You have also the rules, which have been issued from time to time, for selecting stations "in a level country, building towers, inspecting equipments and the whole series of the Department Orders "besides examples and formulæ for computing, &c.

"It is therefore only necessary for me in this letter to add, to the full and complete body of rules you "have received, a few remarks which specially appertain to the undertaking you are about to enter on.

"The general design of the Jogí-Tílá Series, is a series of successive polygons or quadrilateral figures "emanating from the side Jogí-Tílá to Jáolí, conforming to the meridian of the former station and finally ter- "minating by a symmetrical junction with a flank of the side of the Great Longitudinal Series in the vicinity "of Mount Aboo.

"With reference to the figures of the principal series, I am of opinion, as a general rule, that hexagons "or pentagons are preferable to quadrilaterals which seldom can be selected sufficiently symmetrical; ample "rules on the subject of symmetry have been laid down in my Department Order of 22nd February 1854, to "which I need only add that the limits of symmetry, therein laid down, are to be considered as entirely ex- "ceptional, being admissible only in cases of insuperable difficulty or where worse evils are to be avoided. "In all cases the selection must be the best the country admits of.

"The geodetical data of your series are shown in the annexed Memo; but as the values therein set-forth "are not rigorously final, I have to make the following remarks upon the treatment which this circumstance "will entail.

"The linear value of the side Jogí-Tílá to Jáolí is that which was brought up from the Dehra Dún Base, "taken at its value given in Colonel Everest's Arc book. More recent operations, however, have somewhat "modified the height of that base since Colonel Everest's time. When the Great Indus Series is brought "from Karáchi we shall have another verification of height. In the mean time no correction has been applied; "in fact it will be of a very minute order. On the other hand the North-West Himalayan Series, having "emanated from the Dehra Dún Base, closes on the Chach Base, where a small linear discrepancy appeared; "this will have to be dispersed through the Series, and the linear value of the side Jogí-Tílá to Jáolí will be "slightly modified thereby, but of course in a smaller proportion than the ratio at the Chach Base, by reason "of its being less removed from the Dehra line. These corrections are all very minute and can easily be "applied hereafter.

"You are aware that in consequence of the Himalayan attraction no confidence can be placed in the "direction of the plumb line in the vicinity of these stupendous mountains. This attraction is chiefly north "easterly and vitiates, to a certain extent, all results of astronomical observations depending on a true level or "its equivalent the true zenith point. For this reason it has been impracticable to obtain trustworthy azimuths "or latitudes of the North-West Himalaya Series. To enable you to judge of the extent of this disturbance, "I may here cite that the greatest apparent deflection which has been detected amounts to $37''{\cdot}7$ in latitude "and in azimuth to $20''{\cdot}156$.

"Owing to the unfavorable character of the locality above described, the data for latitude, longitude "and azimuth used in the N.W. Himalaya Series have been brought up from the Kaliánpúr Observatory by "trigonometrical computation depending on our assumed figure and dimensions of the earth. The combined "length of the intermediate triangulations is no less than 730 miles, and as no trustworthy verificatory obser- "vations can be obtained along nearly the whole extent there is considerable risk of accumulation of error.

"This circumstance, combined with the slight uncertainty in linear distance before alluded to, may no "doubt affect the computed latitude and longitude, but I do not apprehend that the error in position can be "more than an arithmetical quantity of no urgent importance; but the true direction of the meridian is a "matter of greater anxiety, as the probable accumulation of error may be considerable. If an erroneous "azimuth be adopted at the origin of your series, it would vitiate more or less your results.

"Although the apparent error in azimuth, produced by Himalayan attraction at the origin of the N. W. "Himalaya Series, amounts to no less than $20''{\cdot}156$, the probable deflection at Jogí-Tílá may be estimated to be "very much less, because a glance at the map will show that there are large attracting masses to the left. The "northerly attraction must be still considerable, and although the westerly attraction is not likely to be "equiponderant with the eastern, it must balance a considerable portion of the latter. This conjecture is "confirmed by the test observations for azimuth by the late Mr. Logan at Jáolí. I am of opinion therefore "that as the eastern attraction is so much diminished at Jáolí, it will continue to decrease as you go south, and "we may perhaps reckon on its becoming almost insensible at 100 miles south of Jogí-Tílá, and disappearing "altogether at 150 miles, although meridional effect may continue to be very apparent for 100 miles "further on.

"Under these circumstances the arrangement I propose is that your initial azimuth at Jogí-Tílá, taken "from the N. W. Himalaya Series computations, should be reckoned a first approximation, to be used for a "first series of computations for comparison with observed azimuths to be taken at convenient intervals, say "about 50 miles apart at your meridian stations. On contrasting the computed and observed values we shall "have a series of discrepancies gradually altering, in some proportion to the distance from the attracting mass; "for although in the case of so extensive a range of mountains it would be erroneous to assume a single centre of "attraction common to all the stations, still we may, as a guide to the present, make this supposition for "approximate purposes. Thus if A be a northern station for azimuth observation situated at the distance x "miles from the attracting mass, and B a station m miles further south, then the force of attraction at A will "be to the force at B nearly as $(x + m)^2$ to x^2.

"By this mode of reasoning we may expect that as you recede from the mountains the discrepancy in "azimuth will become, after a certain distance, nearly constant, and when the constancy of the error between "observation and computation is confirmed by a series of three comparisons, we may consider the effect of non- "meridional attraction to have disappeared, and the constant difference may then be treated as the accumulated "angular error in azimuth and applied accordingly as a correction to the assumed value at the origin. With "this corrected azimuth the latitudes, longitudes and reversed azimuths will have to be re-computed, or cor- "rections applied to the difference of angular direction.

"This is my general idea of the best mode of procedure under the peculiar circumstances, but before "you procede to apply the correction, we shall have sufficient data before us to discuss before coming to a "final decision. It would tend very much to throw light on the subject of the mountain attraction if satis- "factory observations were made for latitude at the same stations as for azimuth. These observations how- "ever if multiplied to any extent would impose such an amount of labour on you as to interrupt your pro- "gress materially, which I am unwilling to do for a purpose more of curiosity than practical utility: I would "therefore recommend your confining the latitude observations to the smallest number of stations sufficient "to verify your latitude.

"For this purpose, I think it will be sufficient if you determine the latitude at Murree during next recess; "also at the last station of verification azimuth at which the non-meridional attraction disappears, and at an- "other azimuth station say 50 miles further south. You are supplied with rules and forms for determining "the absolute latitude. I may here add that when the Great Indus Series shall be finished, the latitude "brought up from Karáchi will afford further verification.

"The last geodetical return for the origin of your series, which I have to advert to, is the value of the "height above the sea level or half tide. The height given in the accompanying Memo. is derived from the "N.W. Himalaya Series, taking the height of Banog as given in Colonel Everest's Arc book; but by more recent "and satisfactory observations from the sea level near Calcutta, verified by observations extending to Bombay, "it appears that the old height of Banog is too high by 70·23 feet. The correct height should be used as the "origin for your operations, the process by which it is derived being clearly specified at the head of your "computations for height. This value itself will be subject to future correction, when the sea level is brought "up from Karáchi by the Great Indus Series. The height furnished by that series will be considered more "trust-worthy than any other for Sind and the Punjab, because it gives the nearest practical connection with "the sea, and the best instrumental means and most rigorous modern process will be employed.

"You have been furnished with one of Mr. Simms' new 24-inch Theodolites which is beautifully gra- "duated, has an excellent telescope with high power, and every resource of modern art and ingenuity has been "expended on it. There is however a defect in the axis which prevents accurate levelling and is so far em- "barrassing; the defect cannot be remedied without the assistance of the Mathematical Instrument Maker. I "have no other suitable theodolite to give you in lieu, and in fact this instrument is particularly designed for "your work on account of its vertical circle, which makes it for latitude observations superior to any other in "the Department except the Astronomical Circles. The defect alluded to will not vitiate your azimuthal "observations either terrestrial or astronomical, provided you rigorously adhere to the method of observing "in sweeps alternately from left to right and right to left, using an equal number of both motions, and you "must carefully avoid over-shooting a station. For vertical observations either terrestrial or astronomical, no "error will be caused by the shake in the axis provided the level corrections are applied. The defect is therefore "not a radical one; but as it will render your observations liable to the imputation of careless levelling, I "have alluded to it in these instructions, in order to clear you of that responsibility, and I recommend you "to prefix a remark accordingly to your angle books explanatory of the fact.

"During the recess of 1852-53 Messrs. Armstrong and Dunlop were employed in triangulating the "Jhelum and Chenab rivers, for the purpose of connecting Revenue Survey points and fixing important places.

"This work has not yet been completed, but it will combine well with your operations for which purpose the "angle books have been made over to you.

"Major Shortrede has experienced difficulty in identifying the trigonometrical stations in his district. "It will be one of your special objects to form a proper union with the Revenue Survey, and to fix all points "required by the Revenue Surveyor; besides you will put yourself in communication with Major Shortrede, "in order that the object in view may be accomplished in the most effectual manner beyond all question or "mistake.

"With regard to secondary operations, it is needless for me to enter into any detailed advice to an "Officer of your * * * experience. In a word a Trigonometrical Chart should be a skeleton "map shewing—besides the necessary trigonometrical stations for continuing the series—a few important places "duly dispersed over the sheet, both internally and externally, to about the limit of half a degree on either flank. "These points should be sufficient to form a first connection with all old surveys for the purpose of rectifying "those materials. On the other hand sufficient data should be given for the future Topographical Surveyor. The "lithographed map of the Punjab will serve as a guide for what is necessary to rectify the old geography. It "is always desirable to fix villages or other topographical points near your stations as a guide to their iden- "tification, and therefore in such cases even minor places may be of use, but otherwise only important places "and well marked points of a permanent and unmistakable character, easily identifiable and useful for survey "purposes, need be attended to. Unless the secondary work is thus restricted, the labour of computation will "be a great burden and prevent your producing your results annually without arrears, in the manner described "in Department Orders. In all cases doubtful work should be rejected, for what we want is rather a few "well established points than a great number of an inferior order.

"If you will freely communicate to me your wants and wishes from time to time, as they may arise, "you will find me always disposed to facilitate work and simplify business and render you every support and "assistance in my power; also as you progress in the work, whatever improvements may occur to you as cal- "culated to expedite work, and to produce increased efficiency or greater accuracy, I shall be happy to discuss "with you and give you every credit for originating the same. Uniformity is a standing rule of the Department, "and no improvements should be introduced without previous general discussion and trial."

On the 1st November Lieutenant Walker arrived with his party at the southernmost tower station, in the Jech Doáb, which had been constructed by Mr. Armstrong during the preceding field season, and operations were immediately commenced with a view to erecting additional towers in advance and clearing the lines between them.

The configuration of the country operated in is of a peculiar nature which is characteristic of all the Doábs in the Punjab. The belt of ground lying in the immediate vicinity of each of the rivers—which is known as the khádir land and usually has a breadth of 5 to 15 miles—is on a level which is a little above that of the river during the greater portion of the year, but below it during the summer months, when the melting of the Himalayan snows and the heavy rainfall of the monsoons combine to increase the volume of water enormously, in consequence of which the river then overflows the whole of the lowlands and sometimes overtops the artificially-raised sites of the villages on them. But between the khádir lands of two rivers enclosing a Doáb, there is always an elevated plateau—called the bár—which rises from 30 to 40 feet above the level of the khádir lands, and the edges of which are usually abrupt and perpendicular scarps, forming a well defined barrier to the lateral excursions of the river, but in some parts they descend into the lowlands by slopes so gentle and gradual that the transition is only rendered apparent by the altered aspects of the soil and vegetation. The bár is covered with a growth of stunted trees, scrub jungle and low grass, and is usually destitute of villages, and inhabited only by migratory herdsmen, who wander about with their cattle

around the localities where water is to be obtained, from the wells which have been sunk for their requirements.

Thus very great caution was necessary in the selection of the sites of the stations, more particularly in the instances in which a station in a khádir land and one in the interior of the bár were required to be mutually visible; great labour was entailed by having to clear the lines on the bár of the vegetation by which they were overgrown; and much difficulty was met with in securing the services of a sufficient number of workmen to clear the lines, to sink wells, and to construct the towers; the latter were made of the form described at page 45, and illustrated in Plate 2, of Vol. II of the *Account of the Operations* &c. In his report of monthly progress for November Lieutenant Walker states that—

"For several days we handled hatchet and spade in common with the native workmen, and did our "best to infuse into them that vigour and energy without a large share of which the Jogí-Tílá Series must "stand still. We were fortunate in being opposed by obstacles such as were worthy our efforts to overcome; "our first tower was in a desert, our first trial line in a forest, thus combining the difficulties which have "already been vanquished separately, with such singular success, in other operations of this Survey. To "narrate difficulties is however to repeat a tale often told in our Department; I need say no more therefore "than that the first glimmerings of success have already begun to dawn on our efforts, and to inspire us with "confidence in the issue of the future.

By the end of December sites had been selected for the whole of the stations down to and including the Sángla polygon, and the operations of building and line clearing were progressing so satisfactorily that Lieutenant Walker left them under the charge of Mr. Shelverton, and proceeded to the northern extremity of the Series, in order to commence the measurement of the principal angles. This was to be done with Troughton and Simms' 24-inch theodolite No. 2, an elaborate description of which instrument, by Mr. J. B. N. Hennessey, will be found at page 41 of the Appendices to Volume II.

The observation of the principal angles was commenced early in January at the hill station of Roatála, and under very favourable circumstances; the weather was bright and clear and the theodolite in good adjustment. Unfortunately when the prescribed programme of operations was all but completed and not an hour's work remained to be performed, a violent storm set in which lasted for nearly two days and necessitated the dismantling and packing up of the instrument as a measure of precaution. Every tent was blown down and almost torn to pieces, with the exception of the observatory tent which weathered the storm satisfactorily. The atmosphere became so murky and obscured that it was not until after a delay of four days that the few remaining observations could be taken.

From Roatála Lieutenant Walker proceeded in succession to Jáolí, Chail, Jogí-Tílá and Koár, all hill stations. Nothing worthy of notice occurred at them, save that the weather which had up to this time been bright and sunny, became the reverse of favourable for observations to far distant stations. Strong winds and dust storms were of perpetual occurrence; the heliotropes were constantly obscured, either by passing clouds or by columns of sand whirled up from the beds of the numerous rivers and ravines with which the country is intersected; nor throughout the remainder of the season was the atmosphere ever so favourable as it had been in November and December. This showed that it would be desirable in future to carry out the observations during the earlier instead of the later portion of the field season.

On arrival at Kothiála, the first station in the plains, Lieutenant Walker became aware of the distressing circumstance that mutual visibility between it and the corresponding station of Hela, on the eastern flank of the series, which had been constructed during the per-

vious year, was an impossibility. For Kothiála was situated in the khádir lands of the Jhelum River, Hela in those of the Chenab River, and between them lay a breadth of about 13 miles of the elevated bár, which could neither be built over nor cut through excepting at an enormous expense. It happened that a Hindú temple—the Ker Shiválá—was standing in the vicinity of the line, on the scarp of the bár towards Hela; this temple, being a square building with a flat roof, and not very dissimilar in form from one of the survey towers when viewed from a distance, Mr. Armstrong had mistaken for the Hela tower, when looking at it through a telescope from Kothiála. There was no alternative but to establish a station on the top of the temple, in lieu of the one at Hela, though this necessitated the introduction of an angle at Koár which very closely approached the minimum limit (30°) allowed for a simple polygonal figure of the triangulation. It became necessary therefore for Lieutenant Walker to build a survey pillar on the top of the temple, to construct a balance crane—similar to those used by Colonel Everest on the Great Arc—for the purpose of hoisting the theodolite up to the roof of the temple, and to clear the line to the station of Kadar, before resuming the measurement of the principal angles. Thus the final operations were much retarded, and it became impossible to do more before the termination of the field season than to complete the double polygon around Jogí-Tílá and Kothiála; the extent of the final triangulation was consequently restricted to an area of 1526 square miles, which covers a direct distance of about 54 miles on the meridian of the series.

Mr. George Shelverton carried on the operations of selecting and building stations in advance, and clearing the lines between them, with great vigour and considerable success, so that from this time forward, until the completion of the triangulation, it was never necessary for the measurement of the principal angles to be suspended, nor for the Executive Officer, the signallers and other persons employed in this portion of the operations, to be diverted from their regular duties in order to take a share in the preliminary operations. Mr. Shelverton took charge of the approximate series at the station of Shá-Kot, in the Rachna Doáb—down to which it had been brought by Lieutenant Walker—on the 15th December, and, aided by Mr. W. Dyer, in three months he succeeded in carrying it down to the banks of the Sutlej, over a direct distance of nearly 100 miles. In his report of the operations of the field season, Lieutenant Walker states that—

"Mr. Shelverton had to surmount numerous and great difficulties. Almost the whole of his rays "traverse the well known forests with which the bárs of the Punjab are overgrown. Whenever he em- "erged from them it was merely to find himself on the low level lands adjoining the Ravi and Sutlej Rivers. "These lands interpose a breadth of flat monotonous surface which is always inconvenient and difficult to "span, being too wide for a single side of a triangle, too narrow to admit of two sides, and often requiring "a hazardous extension over the high perpendicular ridge which usually separates the lowlands from the "bár. It is one of the main difficulties of this Series that it crosses the whole of the Doábs of the Punjab in "a diagonal direction; the choice of stations is thus rendered much more perplexing than if the Series were "either parallel or perpendicular to these the chief features of the country. Much embarrassment is also "occasioned by the want of water in the bár; Mr. Shelverton was often compelled to sink wells, varying in "depth from 40 to 110 feet, as a preliminary to the construction of a tower station on these desolate plains.

"On Mr. E. T. Donnelly devolved the duty of clearing rays and building towers in the upper portion "of the approximate series. In so doing he had to cut 23 lines (of an average length of about 11 miles) "and to build 12 towers, all which he did with care and judgment and due regard to economy. After the "experience gained in his early performances he succeeded in cutting rays with considerable accuracy, his "lines sometimes falling on and invariably near the centers of the towers to which they were directed.

"On discovering that the misfortune regarding the station of Hela would make it impossible for me

"to do more than complete the Jogí-Tílá double polygon during the season, I despatched Mr. Donnelly "to observe the angles of the Jeto and Múgo polygons with a 12-inch theodolite. This duty he performed "very creditably, and with sufficient accuracy to afford respectable data for the compilation of any maps "which may be required to be issued before the observations with the large theodolite can be taken and "reduced."

During the latter portion of this field season, Lieutenant Walker had been much struck by the variations which he met with, at different hours of the day and on different days, in the amount of the vertical refraction of the signals on the lines between his tower stations. These lines grazed the surface of the ground very closely, and thus the rays of light from the signals to the observer traversed a medium which was subject to many changes, being sometimes thick and murky with dust or moisture, and at other times rarified by the heat which was radiated at mid-day from the surface of the ground. Thus the apparent relative height of one station to another, as seen from the other, would vary greatly at different times of the day, the maximum value being sometimes 100 to 150 feet in excess of the minimum.

It had for many years been the practice in this Survey to endeavour to eliminate the effects of variations of refraction by taking the back and forward vertical angles at the same time of the day, and always between the hours of 1 and 3 after apparent noon, at which time the refraction is a minimum; for by so doing there is greatest probability that both the observed angles will be equally refracted, and consequently that their difference—from which the angle subtended by the excess of the higher station over the lower is deduced—will be free from error of refraction. But the anomalies and irregularities of the trajectories of light in the lower strata of the atmosphere, as already instanced, rendered it highly improbable that the refraction could be equal in the back and forward angles, even when the observations had been made with all the prescribed precautions. In general there is only one large theodolite with each survey party, so that the back verticals are not measured until several days and sometimes weeks after the forward verticals; and in the interval the weather may have changed, and with it the refraction, which therefore can be no longer wholly eliminated. Moreover at the time of minimum refraction the signals are usually greatly magnified and agitated, and cannot be observed with much exactitude. See Section 5 of Chapter IV of Volume II, on "The influence of atmospheric conditions on the procedure of the observations."

Lieutenant Walker therefore submitted a proposal to Colonel Waugh to employ one of his assistants, in the following field season, in running lines of levels with a spirit leveling instrument between the stations in the plains. And this proposition having been assented to, arrangements were made during the intervening recess to secure the requisite instruments. It was ascertained that some very fine Standard Spirit Levels, by Messrs. Troughton and Simms, had been recently procured from England by Colonel Napier (now General Lord Napier of Magdála, and Commander in Chief in India) for the Punjab Canal Department; two of these and six sets of leveling staves were obligingly lent for the proposed operations.

On the termination of the field season the party proceeded to its recess quarters, which had been established at the contiguous sanatarium on the Murree Hills. The 24-inch theodolite was despatched to the Head Quarters at Mussoorie, to have certain additions and alterations effected there, under the personal superintendence of Colonel Waugh, aided by Major Strange, whose mechanical skill had frequently been turned to account for the improvement of the instruments of this Department, and eventually led to his being appointed Examiner of Scientific Instruments to the Secretary of State for India, shortly after his retirement from active service in this country, in the year 1860.

It appears desirable to give in this place, before resuming the narrative of the operations, Colonel Waugh's account of the alterations which were made to the 24-inch theodolite at Mussoorie, and also some extracts from his instructions to Lieutenant Walker on the manipulation of the instrument; as these may not only be useful to other persons engaged in similar operations, but are valuable as a record of the great pains which Colonel Waugh took to impart to his newly joined officers a full knowledge of every thing they might be called on to perform in observing with one of the great theodolites, from the taking of the instrument out of its box, setting it up and adjusting it at any station, to dismantling and repacking it for transport elsewhere. The following extracts give only a small part of the instructions, and omit all the portions which require to be illustrated by drawings in order to be rendered intelligible; but they serve to indicate the precise and minute nature of the rules which were laid down for general guidance. They were due in great measure to the circumstance that all large instruments of this nature are liable to get speedily out of order, and to give unsatisfactory results, unless they are very tenderly handled; that they have to be most carefully guarded from shocks in transit, and that, should they happen to get out of order, it may be necessary to send them a distance of many hundred miles to be repaired, the result of which would be that the few months in the year of clear and favorable atmosphere, during which alone observations can be satisfactorily conducted, would be lost.

Report on alterations made during 1853 *in Troughton and Simms' 24-inch Theodolite No.* 2.

"This instrument has had two additional horizontal microscopes applied to it; having now five, instead of three as formerly. In order to apply these it was found necessary to alter the position of all the three original microscopes. They were accordingly all taken off and refixed, the whole five being now equidistant *viz.* 72° apart.

Two additional microscopes applied.

"This addition to the instrument involved the alteration of the three horizontal clamps to the following extent. The clamp now near B microscope was shifted 11½° to the left of its original position, and its tangent screw was reversed, that is, the head of the tangent screw, which was to the right is now to the left. The clamp now near E microscope was shifted a small quantity to the right. The clamp now between C and D microscopes, has had its tangent screw reversed, the head being now to the left.

Position of clamps altered.

"There were formerly two spiral springs in each of the clamps, whose office it was to force the lower jaw of the clamp to descend free from the circle on releasing the clamp screw. They were found to oppose a force to the clamp screw, in clamping, such as to make it difficult for the observer to know when the first contact of the clamp with the circle took place, and this uncertainty diminished his power of clamping with the delicacy necessary in the case of this instrument. These two spiral springs were therefore removed, and a contrivance was substituted for them, which has equally the effect of forcing the lower clamp jaw to descend in unclamping. This contrivance consists in a groove having been turned in the shoulder of the clamp screw, into which enters a fixed forked plate of brass which renders it impossible for the screw to rise if the lower clamp jaw should refuse to fall, as sometimes, when dirty, it might happen to do. The screw thus having no power to rise, the lower clamp jaw is compelled to descend.

Spiral springs removed from horizontal clamps and substitute applied.

"The reflectors of the horizontal microscopes have had notches filed in them at the back to admit of their being placed more nearly vertical than before, by which means a greater range of illumination has been obtained.

Horizontal reflectors notched.

"The main plate or table upon which the pillars stand was formerly attached to the head of the axis by four large capstan-headed screws only. It was considered that there might be a liability to azimuthal motion between

Two steady pins applied to table.

"these two parts, the tendency of which would be to alter the existing relation between the telescope and "the horizontal circle, or in other words to change the horizontal zero of the instrument. To guard against "this evil two strong steel steady pins have been fixed into the table, the ends of which enter appropriate holes "in the head of the axis, which addition must diminish the chance of azimuthal motion between these parts "taking place.

Adjustible Y strengthened.

"The slide in which the adjustable Y moves vertically, not being considered substantial enough to be in "itself a sufficient guarantee for the perfect invariability with respect to *lateral* play of the Y, two strong steel screws have been "added to this part of the instrument; they penetrate the Y and screw into the solid block beyond, binding "the two parts together with great force.

Horizontal clamps made rigid.

"The clamps have, besides being altered in position, undergone a change in structure. It was surmised "that the discordance between horizontal readings of the same object, taken alternately with right and left hand motions, might be "owing to the yielding of the clamp plates; it was determined that these plates should be made as rigid as "possible, which has been done by attaching to their under surface and to the cocks that carry them a very "substantial brass frame, that renders them quite devoid of flexure in any place.

Adjustment applied to horizontal clamp.

"It has always been found a difficult matter to adjust the clamps of this instrument (as they were "formerly constructed) so that the act of clamping should not "disturb the level, and at the same time that there should be as "little friction as possible between the upper clamp jaw and the circle. There were no special means of "effecting this adjustment, and it had always to be executed by bending the elastic clamp plate, an uncertain and unsatisfactory species of manipulation.

"The clamp plate being now no longer elastic some systematic adjustment became necessary, and "its rigidity rendered such adjustment the more feasible and efficient. The separate instructions for "performing the adjustment of the clamps will render the structure of this new apparatus clear.

Graduated head and index applied to socket and vertical axes.

"A graduated ring has been added to the socket of the vertical axis, and an index to the steel "relieving screw, by means of which the adjustment of the "vertical axis to the required degree of glibness will be facilitated. The method of using this application will be given in "the additional instructions for this instrument.

Key for unscrewing high power eye-piece made.

"The cell of the highest power eye-piece (marked 112) became occasionally so tightly screwed into "the telescope as to be incapable of removal by the hand. "Two brass pins have therefore been inserted into the rim of "the cell in question and a brass key made to fit them, by which means the cell is easily removed.

Apparatus for lifting vertical axis out of socket for cleaning.

"When the vertical axis of this instrument has required cleaning and lubricating it has been usual "to lift it out of its socket by hand. This operation is awkward "owing to the length of the axis and to the height to which it has "consequently to be raised; nor is it unattended with danger to "the horizontal circle. An apparatus has been devised for performing this operation both more safely and "more conveniently. A separate paper, describing this apparatus and the method of using it, has been drawn "up.

Triangles for centering stand.

"The operation of changing zero is much facilitated if the iron annular ring of the stand be centered "truly over the station dot. This has hitherto been effected in the "case of this instrument by means of temporary expedients. An "iron triangle has now been prepared for this special purpose, and instructions for its use drawn up.

"On examining the stand of this instrument it was found that the three thick brass plates, forming "the medium of attachment between the iron annular table and "the wood work, were fastened to the latter by means of "wood-"screws" of brass. This was not considered a sufficiently secure "fastening, taking into account the great weight of the annular table and the jars it is liable to encounter in "travelling; nor was it thought to afford an adequate resistance to possible lateral yielding in observing "horizontal angles. The insufficiency of the fastening was also attested by the fact of the fibres of the "wood having, in the case of two of these screws, yielded, so as to leave the screw loose and inoperative. "Iron bolts and nuts have been therefore substituted for these brass screws. The bolts have square heads "countersunk into the lower surface of the lower plank of which the top of the stand is composed; the "bolt passes through both planks and through the thick brass plate to which the iron table is attached, "and those three parts are bound firmly together by the action of the nuts countersunk into the thick brass "plate, and are accessible from above after removing the iron annular table. The smaller end of the key "provided for turning the adjusting or leveling screws of the annular table fits these nuts also. As an "additional security against lateral movement the thick brass plates have been bedded into the wood to a "depth of about ¼ of an inch, and to ensure a firm bearing a plate of sheet lead has been interposed between "the brass plate and the wood.

Bolts and nuts substituted for brass wood-screws for fastening upper thick brass plates to wooden top of stand.

"The addition of the horizontal micrometers in this instrument has involved alterations in the box "in which it is packed. There were formerly three wooden bars "fastened by brass milled nuts across the arm of the tribrach, to "keep the instrument in its place in the event of the box being "upset—an accident very liable to take place on board ship. The room taken up by the additional micro-"meter arms prevented the application of these wooden bars. There have been therefore substituted three "iron bars somewhat differently arranged. The two screws and nuts that secure each of the new bars are "both on the same side of the tribrach arm. The screws pass through elongated holes, so that the bars "admit of being moved backwards and forwards a small quantity in the direction of their length. In the "one case the tribrach arm is left free to be raised for unpacking, in the other it is prevented from leaving "its place by the end of the bars crossing it; and in the latter position, when the nuts have been tightened, "the instrument is in a state proper for travelling. Special instructions for unpacking the instrument in its "altered state, have been drawn up.

Alterations in the provisions for securing the instrument in travelling.

"New wires have been inserted in the telescope. The central vertical wire and the horizontal wires "are of spider's web; the four side vertical wires are of silk and "have been designedly selected for their comparative coarseness "in order to diminish the risk of their being inadvertantly mistaken for the central wire in observing "horizontal angles. The equatorial values of the intervals between the five vertical wires have not been "determined.

New wires inserted in telescope.

"The rim of the horizontal circle, when acted upon by the clamps, was found to be not in a plane "truly perpendicular to the vertical axis. It was much improved by turning but is not yet quite perfect, the "circle being not rigid enough to oppose the turning tool without bending. In performing this operation, one "person turned the instrument round, whilst the operator held a turning tool firmly against one of the "clamps.

To adjust the relieving apparatus of the vertical axis.

"A graduated brass circle has been attached to the socket, and an index to the head, of the steel reliev-"ing screw. The graduations are intended to be used differentially; the absolute reading of the circle will "vary from time to time. This adjunct has been added to the instrument, in order to facilitate the adjust-"ment of the instrument by the means which it affords to the observer of estimating with some exactitude

"the effect of the screw in increasing or lessening the glibness of the axis, and of judging better than he "could do without its assistance how much more adjustment is required to obtain the degree of glibness "desired.

"Before attempting the adjustment the relieving screw should be retracted, (its clamping nut having "been previously released) so as to allow the axis to descend completely as far as its form admits, into the "socket. It is to be remarked that it will not descend immediately on the withdrawal of the support afford- "ed by the screw. The oil at first sustains it and its descent is gradual. After a few minutes, particularly "if the instrument be moved a little backward and forward in azimuth, the axis will descend so as to be very "stiff. It is then in a proper state for the adjustment to be proceeded with.

"The clamp nut being quite loose, now turn the relieving screw with the finger and thumb, using "no capstan pin until it is felt to be just sensibly in contact with the end of the axis; then note the readings "of the index on the graduated brass circle. Repeat this several times until assured that the reading of "contact has been ascertained within one or two tenths of a division and make a memorandum of that read- "ing. Now with the help of a capstan pin turn the screw to the extent of about 2 divisions beyond the "reading of contact. Tighten the clamping nut.

"Now try the glibness with deliberation; it will not be exactly the same at first as after a lapse of a "few minutes, owing possibly to the oil requiring time to adopt itself to a change of circumstances. If the "glibness seems satisfactory, examine the clamps; if they rub strongly against the circle, the circle and axis "have been raised more than was found sufficient in the recent experiments at Masúri (provided the clamps "have not been altered). If on the other hand the circle has not been raised sufficiently this will be known "to be the case by observing that the act of clamping disturbs the level, which it should not do. Another "test of the adjustment is the permanence of the level readings when the instrument is turned round a "whole revolution in azimuth. This permanence has been found to depend wholly on the adjustment of the "axis; if the axis be too much relieved, the instrument will certainly not level well. The three conditions "therefore to be fulfilled are—

"1st. That there be only the slightest possible friction between the clamps and the circle.

"2nd. That the act of clamping does not disturb the level.

"3rd. That the level readings be steady when the instrument is turned about in azimuth.

"It has been found that if these conditions were complied with the axis will also be sufficiently glib for "horizontal angles. If however a doubt on this vital point should arise, it will be found necessary to "alter the adjustment of the clamps before the axis can be raised sensibly higher.

"When the adjustment of the axis has been quite satisfactorily accomplished, the readings of the "index should be noted. The difference between this reading and the reading of contact (previously record- "ed) will be the amount in terms of the graduated circle, if the relief is found to be sufficient, and this will "afford valuable information for future guidance. In the late experiment at Masúri this was found to be "2 divisions of the graduated circle.

"It may be here noted that the relieving screw was found by careful measurement to have 18·69 "threads in one inch. Hence an entire revolution of the screw is equal to 0·0535 of an inch, and this "quantity divided by 120 (the number of divisions in the circle) gives 0·000446 of an inch for the value of "one division. But the axis being conical, the separation between it and the socket due to one division of "the circle will be less than this quantity. In the present case if the angle of the cone be assumed at 10° "the amount of separation due to one division of the circle will be =0·000039 of one inch. The relief "amounting however to two divisions, double this quantity, or 0·000078 inch, will be the amount of sepa- "ration. But it is probably less than even this minute quantity, for the angle of the cone is not so much "as 10° nor can the part be assumed to be so perfectly rigid as that the whole computed effect of the reliev- "ing screw shall take effect. Hence it would appear that in order to make this instrument level well it is "necessary that the axis and its socket should be separated by an extremely minute space.

"The graduated micrometer circle above described screws on to the male screw cut at the bottom of "the socket cup for the reception of a collimating telescope supplied with the instrument. When it is "desired to use that adjustment the micrometer circle must be unscrewed and removed, but before doing "this, the index, which is fastened to the relieving screw by two brass screws, must be taken off.

To observe horizontal angles with this instrument.

"The experiments made lately at Masúri tend to the conclusion that if used in the manner hitherto "used, a force is generated to which the tangent screw, in completing an intersection, opposes itself. This "force resides in the vertical axis and is apparently of the nature of torsion. That it does exist, and that it "does not yield entirely to the action of the tangent screw, may be proved by taking an intersection in the "usual way and then unclamping. The wire will be seen immediately to leave the object observed, as if "acted upon by a spring. If the object be again intersected and the clamp released, and this be repeated "several times, it will be found that each time the amount of apparent elasticity will diminish until, after "numerous trials, it disappears.

"A shorter method of bringing about the same result is to adopt the plan now recommended. Bring "up the instrument in the usual way, until the wire be near the object to be observed. Clamp. Now move "the wire by means of the tangent screw from one side to the other of the object by equal quantities, begin- "ning with a space about equal to the intervals between the centre and the nearest side wires, gradually "diminishing the excursions of the wire, keeping them equal on either side until they approximate the wire "to the centre of the object. Now unclamp. The wire will probably remain on the object, if the clamp has "not been very tight and if the unclamping has been performed with a light hand. If the wire however still "springs aside, re-clamp and repeat the approximate intersection. If the clamps are well adjusted, that is "quite parallel to the circle, this will not require to be done more than once. All torsion being thus elimi- "nated, the minute touch of the tangent screw necessary to convert an approximate into a perfect intersec- "tion will be too minute to have any prejudicial effect.

To take off a vertical micrometer.

"1st. Draw off the illuminator.

"2nd. Loosen the lower of the three screws that adjust the microscope laterally.

"3rd. Loosen and remove the clamping nut nearest to the telescope. The microscope can now be "drawn out of the ring at the end of the arm that sustains it.

"NOTE.—Before loosening any of the screws, measure with a pair of compasses the distance between "any fixed point on the microscope and any fixed point on the arm. This measure will assist in restoring "the microscope approximately to its proper position for run.

To take the micrometer to pieces for the purpose of cleaning it.

"1st. Unscrew the tube that holds the eye-piece.

"2nd. Take out the eight small screws that fasten the outer plate to the micrometer box.

"3rd. Slightly loosen the two small screws, that fasten the outer plate to the box, without doing "which it may not be easy to remove the outer plate which is usually pinched by these two end plates.

"4th. Remove the comb adjusting screw.

"5th. Remove the end plate opposite to the micrometer screws. In doing this it is necessary to "guard against the effect of two spiral springs, which pressing against the end plate, urge the comb plate into "bearing with its small adjusting screw. The end plate must be held lightly with the fingers against the box "whilst the small screws that fasten it to the box are being removed, the pressure of the finger being then "gradually relaxed. The end plate and the two spiral springs will come away without fear of accident.

"6th. Bring the micrometer screw into action so as to contract to a certain extent the spiral springs "that keep it and the slider in bearing. Now pass a pin through the coils of the spring into a small hole in "the brass cylinder round which the spring is wound. Relax the micrometer screw, and it will be found that "the spring no longer presses against the slider, but against the pin just inserted through the hole in the "brass cylinder.

"7th. Remove the micrometer screw.

"8th. Remove the end plate through which the micrometer screw passes.

"9th. The slider is now perfectly free, and can be lifted out of its box.

To clean the micrometer screw.

"Make a little wooden clamp, something like a pair of nutcrackers, in the notches of which grasp the "screw, applying oil and work the screw from end to end several times. Wipe the oil and dirt off the not-"ches and work the screw through them again; repeat the process until the thread of the screw, when "examined with a magnifier, looks perfectly clean.

"The wood of which the cleaning clamp is made should be very soft. Two ceder pencils answer "very well.

To clean the female micrometer screws.

"Prepare a piece of soft wood (a ceder pencil) with a triangular section, slightly tapering towards its "extremity and of such dimensions that its tapered extremity will just enter the female screw.

"This triangular wood plug being worked in the female screw, first with oil, and afterwards dry, will "thoroughly clear out the threads; which a cylindrical plug would not do so well, as there would be no space "for the dirt to escape.

"NOTE.—A little oil should be applied to the micrometer screw and to its shoulder which bears "against the box, but no oil should be applied to the slider or to any part of the interior of the box.

To unpack the body of the instrument.

"1st. Remove and lay aside the front half of the shelf that crosses the middle of the box.

"2nd. Draw out the board on which the instrument stands, the roller being placed underneath it to "relieve friction, and to support the front end when out of the box, the rear end remaining to a small extent "still in the box.

"3rd. Let two strong men seize the board by its side edges. Direct them to draw it completely "out of the box, and whilst doing so to support the whole weight, so that on clearing the box it may not fall "to the ground. Whilst they are doing this, remove the roller from underneath, and direct the men to de-"posit the board and instrument gently on the ground clear of the box.

"4th. Loosen and remove the brass milled nuts and washers that secure the bent iron bar over No. 3 "foot screw. Remove the bent iron bar and place it aside. To do this the lower or left hand end of the bar "must be first cleared of its screw; then turn it round the upper or right hand screw, so that the bar should "point towards the centre of the instrument. It can be easily lifted off the upper or right hand screw.

"5th. Loosen the brass nuts that screw the other two straight iron bars over foot screws 1 and 2. "Push these bars back, so as to be clear of the tribrach arms. They need not be removed.

"6th. Let three strong men lift the instrument by its three feet from the board, and place it on the "stand, being careful that they do not strike the long vertical axis against the stand in doing so.

"NOTE.—The bent iron bar has to be removed in order to prevent it injuring the hand of the person "who lifts foot screw No. 1. The other two bars are out of the way and do not therefore require removal.

To pack the body of the instrument.

"1st. Draw back the reflectors of the vertical micrometers so that they shall be almost in contact "with the object glass cell of the microscope, then will there be less chance of their falling off in travelling.

"2nd. Lift off and pack the telescope in the usual way. No alteration has been made affecting this "part.

"3rd. Tighten the vertical clamp screw.

"4th. Set the index of the horizontal circle to 173° and tighten all the three horizontal clamps.

"5th. Arrange the board on which the instrument stands when packed, so as to be just clear of the "box and resting on the ground, and remove the bent iron bar from foot 3.

"6th. Let three strong men lift the instrument from its stand to the board, cautioning them against "striking the vertical axis.

"7th. Place the instrument on the board with its foot marked 1 in front.

"8th. Put on the bent iron bar over foot 3. This is done by first passing its right hand or upper "end over the proper screw, keeping the bar, whilst doing so, at right angles to its permanent position. It "will now be easy to pass the lower or left hand end over the other screw. Apply the washers and nuts.

"9th. Push forward the three iron bars and tighten their nuts.

"10th. Let two strong men lift the board and instrument from the ground, insert its near edge into "the slides and push it into the box.

NOTE.—Hitherto it has been customary to release the steel relieving screw of the axis for travelling. "It is now however proposed that the instrument shall travel with its vertical axis in the same state of ad- "justment as when used in observing."

Season 1855-56.

PERSONNEL.

Lieutenant J. T. Walker, R.E.
Mr. G. Shelverton, Sub-Assistant.
„ C. J. Carty, „
„ E. T. Donnelly, „
„ A. W. Donnelly, „

On the arrival of the 24-inch theodolite from Head Quarters, at the commencement of the field season of 1855-56, the measurement of the principal angles was resumed. The instrument was first set up at the station of Nár (XLIV), on the terminal side of the Jogí-Tílá double polygon, and operations were commenced in the confident expectation that, with its additional microscopes and other improvements which had been recently effected, the instrument would give even better results than it had done in the previous field season. But this expectation was disappointed; the measures of the horizontal angles on a few of the zeros* were accordant and satisfactory, while on other zeros they were grossly discordant.

The whole of the lines under observation being rays which were cut through forests, and grazed the surface of the ground and the sides of the cuttings very closely, the signals were much affected by mirage and refraction; the rays of light from the heliotropes and lamps, though exhibited through diaphragms of small aperture, frequently appeared as huge, irregular masses of fire by day and of luminous vapour by night; they were occasionally seen to have unmistakeable lateral refraction, oscillating from side to side to a considerable amount, so that it was impossible to fix the central point of their gyrations with much precision. This being Lieutenant Walker's first essay at the measurement of the principal angles under such difficulties, he attributed his discordant results partly to the conditions under which the observations were taken and partly to his own want of skill, and he endeavored to eliminate the errors by greatly multiplying the prescribed number of measures of each angle.

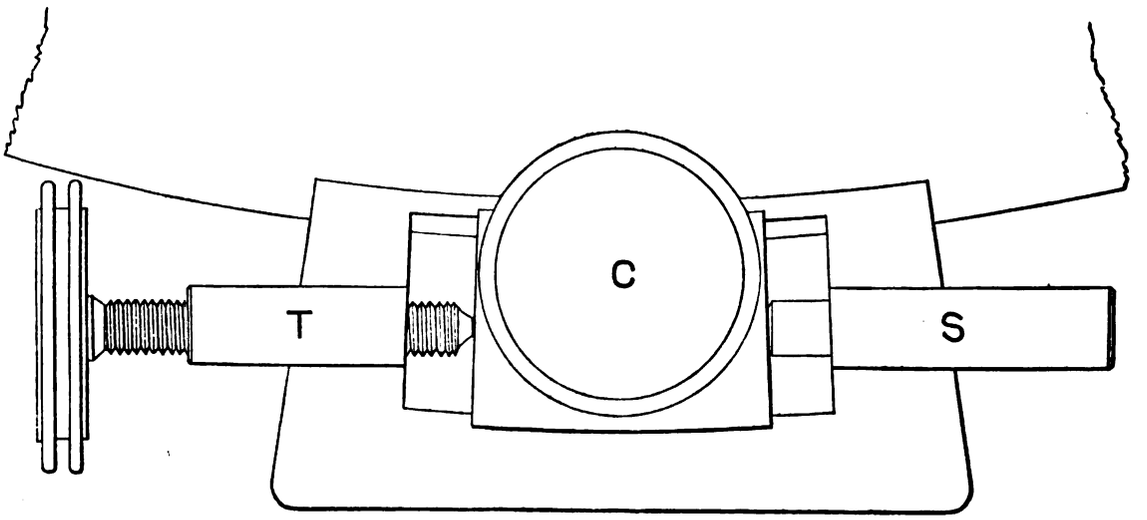
* See the Description of the Signals used in the Principal Triangulation, Section 3 Chapter III, Vol. II.

On proceeding to his next station, Kadar (XLV), he found that his measures of the horizontal angles were very fairly consistent and satisfactory, though there had been no improvement in the conditions under which the observations were taken. But at his third station—Ratowál, a secondary point temporarily established with a view to determining the length of a small base line in terms of the unit of this Survey—some of the signals under observation were only a short distance off and were unmistakeably clear and well defined; yet the angular measures were again as inconsistent and discordant as they had been at Nár. Thus it seemed probable that some radical defect had been introduced into the instrument by the alterations to which it had recently been subjected at Mussoorie, for such gross discordances had never been met with in any of the measures which had been taken with it previously.

In this instrument the horizontal circle revolved with the telescope, the microscopes were fixed at equal distances apart to the exterior of the socket within which the vertical axis revolved, and there were three tangent screws which were respectively mounted over the arms of the tribrach at the base of the instrument, and, being thus placed at 120° apart, one or other of them was always within convenient reach of the observer, whatever the direction the telescope might be pointing to.

After much careful examination and many experimental observations Lieutenant Walker at last discovered that the defect lay in the reversal of two of the tangent screws, which had been done in order to permit of the introduction of the two additional microscopes, while the third tangent screw had been left in its original position.

The tangent screws were of a novel form—due it is believed, to the ingenuity of the makers—which is shown in the following woodcut, in outline, without any of the screws for adjusting it to the plane of the horizontal circle, or the attachments to the arm of the tribrach.



T represents the socket in which the screw acts, C the head of the clamp on the circle, and S a cylindrical box containing an antagonizing spiral spring. It will be at once seen that the screw merely acts on the clamp by abutting against its left face, and that the spring abuts against the right face; thus the screw can only move the clamp in the direction from left to right, and consequently when motion is required in the opposite direction, it can only

be obtained by relaxing the screw, and thus bringing the spring into action. The contrivance appears to have been designed with the object of getting rid of the lost motion, on reversal of direction, which is generally met with in tangent screws of the usual construction, working in a socket within the clamp, and is often very troublesome to the observer, more particularly in an old instrument the threads of the screws of which have become much worn by constant use; it secures this object, but introduces other evils which are quite as objectionable.

With a tangent screw of this construction it is always necessary to make the final intersection of any object—viewed in the telescope—by working the screw against the clamp, not by releasing the screw and allowing the spring to act, for the action of the screw is definite and regular while that of the spring is uncertain. Thus with a screw in the position indicated in the wood-cut, with its head to the left of the clamp, the direction of motion for the final intersection would be from left to right; and with all the three tangent screws in the same position, this would always be the final direction of motion, whichever screw might be used for the intersection. In the original construction of the instrument all three tangent screws were fixed with their heads to the right of the clamp; but during the alterations at Mussoorie two of them were reversed, while the third was not altered. Thus with the two whose positions were reversed the final direction of motion on intersection became from left to right, while with the third it remained from right to left, and thus the originally invariable continuity of direction was lost.

Selecting a good signal for observation, and intersecting it with the three tangent screws in turn, Lieutenant Walker found that, while the circle readings with the two reversed screws were always accordant, they differed by about 6″ from those by the third screw, evidently because of the change in the direction of motion in the final intersection of the signal. This was further substantiated by each of them singly; when made to intersect in one direction by the screw and afterwards in the opposite direction by the spring, similar differences were met with in the circle readings. Clearly therefore it was essential that the direction of motion, prior to the final intersection, should be invariable in all rounds of angles measured with this instrument, in order to obtain strictly differential results and eliminate the influence of these constant errors.

The discordances at Nár and at Ratowál were now found to be due to the circumstance that the three tangent screws had been used indiscriminately at those stations; and the accordances at Kadar to the circumstance that the third tangent screw, whose direction was opposite to that of the two others, had required sundry alterations and been removed in order to have them effected, so that during the whole of the measures at that station the two tangent screws which worked in the same direction had been employed.

The actual cause of this peculiarity in the behaviour of the instrument was not discovered for some time. It was at first attributed to torsion in the long 'turned down' vertical axis on which the telescope and circle revolved, and Major Strange designed a new form of axis, much shorter than the first and 'turned up', to replace it; and in 1861 an axis of this form was constructed in the Mathematical Instrument Department at Calcutta, by Saiyad Mir Mohsin, and substituted for the original axis. But the result was that the differences between the circle readings with opposite directions of motion were found to be largely increased, which clearly showed that the original axis was not to blame. Then the Saiyad discovered that the defect lay in the construction of the horizontal circle, which was in the form of a wheel, with thin spokes radiating independently from the centre and not braced together; it appeared that, though the circle and the radii had all been cast together in one piece, there was considerable elasticity in the radii, so that when the axis was stiff the circle might, if unclamped, be moved tangentially by the finger through an arc of 10″ to 15″, under the microscopes, without disturbing the intersection of the telescope on a distant object. The clamps

and tangent screws acted directly on the azimuthal circle, and not on a separate clamping circle; the differences met with in opposite motions were clearly due to the elasticity of the radii of the azimuthal circle, and their magnitude was greater or less according as the axis was working stiffly or glibly. The new axis, though theoretically an improvement on its predecessor, was constructed less skilfully, and thus it worked with much greater friction and the errors arising from the faulty construction of the circle were greatly magnified.

Eventually the old axis was restored and a second circle was added on which the clamps and tangent screws were made to act; thus the graduated circle was permitted to revolve freely, and was no longer operated upon, as it never should have been originally.

On discovering the anomalies in the performances of the instrument, and their connection with the direction of the tangent screws, Lieutenant Walker took immediate steps to reverse the third tangent screw, so that it might point in the same direction as the others. This involved the necessity of making sundry castings in brass for the new attachments, which fortunately were not beyond the capacity of the nearest blacksmith available; but the work took some time, during which the observations had to be suspended.

When the alterations were completed Lieutenant Walker returned to the station of Nár, to ascertain which of the original measures of angles had been made with a continuous direction of motion and which with the direction reversed between contiguous rays; the former were retained; the latter were rejected and repeated with the instrument in its amended condition. From that time forward the instrument gave no further trouble, and the measures of the angles were invariably found to be fairly accordant and satisfactory.

Notwithstanding the long delay thus caused at the commencement of the field season, the measurement of the principal angles of four polygonal figures—the Jeto, Múgo Sángla and Mohárawála hexagons—was finished by the end of the field season, whereby the Series was extended a direct meridional distance of about 83 miles to the south. The two last angles of the season were measured at the station of Rurálla (XXIV) towards the end of the month of March. No rain had fallen for some time, the heat was great, the atmosphere thick and murky with sand and dust, and there was every indication of the advent of a period of hot winds—like the simoons of Arabia and Syria—during which the state of the atmosphere would be such as to shut out all view of distant points. Lieutenant Walker was most anxious to complete the measurement of the angles before this should happen. For the whole of an afternoon, from about 3 P.M. until nearly midnight, he was constantly watching the signals with the mortification of finding them too wild and irregular to be satisfactorily observed. At last, just as he was about to abandon work for the night, he noticed an improvement in their appearance; by degrees the turmoil and agitation was succeeded by a calm, and the signals began to shine out like stars, and became clear, bright and definite, and were no longer hazy and nebulous. Seizing the auspicious opportunity, he returned to the theodolite and commenced observing, and just managed to complete the prescribed tale of measures by daybreak on the following morning. This was all the more fortunate because the calm turned out to be of very short duration, and was merely the prelude to a simoon storm, which set in with great violence on the following day, and lasted for upwards of a fortnight, during which all objects at a distance of more than a few hundred yards were shut out from view.

Mr. Shelverton was employed throughout the field season in carrying on the usual preliminary operations in advance of the principal triangulation. Mistrusting some of the sites which he had selected as stations during the previous field season—the lines between which were of excessive length for the country, which is generally flat and almost perfectly level, but occasionally presents treacherous undulations which cannot be disregarded without a risk of their

intercepting the view between the stations—he examined the ground very thoroughly and made some judicious alterations. By the end of the field season he had extended the 'approximate series' to the south bank of the river Sutlej, clearing 47 lines of an average length of 11 miles, building 11 towers ranging in height from 22 to 32 feet, and sinking 5 wells to a depth of 50 to 60 feet, at stations where water was not otherwise procurable. In these operations he was assisted by Mr. E. T. Donnelly.

It is now necessary to describe the measures which were carried out with a view to determine the relative heights of the stations on the plains by spirit leveling operations, as a check on the trigonometrical determinations, in conformity with the suggestions made by Lieutenant Walker to Colonel Waugh which have been already adverted to (page x—G.).

First the instruments supplied by the Punjab Canal Department had to be examined and tested. The standard spirit levels had good telescopes with a focal length of 21 inches and eye-pieces with powers of 20 to 30; thus their optical capacities were as good as need be desired. But their axes of rotation were very small in proportion to their magnitude and general massiveness, which rendered them so top-heavy that it was hopeless to level them perfectly, and the bubble of the level rarely returned to the same point after, as it stood at before, a rotation. The values of the 'runs' of the levels were therefore determined, in order that corrections might be applied for dislevelment, as is done for all astronomical instruments; and a table was prepared for each instrument showing the corrections for dislevelment to the readings of the staves at the different distances likely to be met with in practice.

The staves were of the description termed 'reading staves'. They were of sall wood, 10 feet long, by 2·5 inches broad and 1 inch thick, and were made in pairs, a brass socket being attached to one staff, into which the other was fitted with its face towards that of the first, so that the graduations of both were protected from injury in travelling. They were furnished with plummets to enable them to be set up truly vertical. As their lengths were not known in terms of the unit of length of this Survey, and at that time no light and easily portable copies of the Standard of Length—see Section 2, Chapter I, Volume I—were available, Colonel Waugh directed that a small base-line should be measured with the staves and connected with the triangulation, with a view to determining the true length of the staves. This was done at the commencement of the field season, the base being measured on a flat piece of ground between the principal station of Kadar, and the subsidiary station of Ratowál, where the experiments for ascertaining the cause of the unsatisfactory performances of the 24-inch theodolite were conducted. That the precaution was by no means unnecessary is shown by the circumstance that the error of the unit of the staves was found to be as much as half an inch in 10 feet.

The system of operating with a pair of staves instead of with a single staff was adopted; and, in order to eliminate the influence of constant instrumental error, it was made the rule at each station to set up the instrument at equal distances from the back and the forward staves, either midway on the line between them, or at the apex of an isosceles triangle of which that line was the base. The forward staff at one station was kept in position so as to become the back at the next. The staves were invariably rested on hemispherical brass brads, in the heads of wooden pins, which had been firmly driven into the ground at the points where the staves were to be set up.

The leveling operations were commenced on the line Nár to Kadar, which was leveled twice, once by Lieutenant Walker and the second time—but in the opposite direction—by Mr. Carty, by whom all the subsequent lines of levels were executed. These were carried over the sides of several triangles, and formed ten circuits for mutual verification. One circuit lay to the north of the initial side and connected the station of Kothiála; for the absolute

height of that station had been well fixed by the measurements of the vertical angles to and from the contiguous hill stations, and it therefore served as the best available datum for the differential heights of the leveling operations. The remaining circuits all lay to the south, in the Jeto and Múgo polygons.

The following table represents the differential results which were obtained, and the errors at the close of the circuits, the smallness of which are very creditable to Mr. Carty, who did his work with scrupulous care and fidelity.

Lengths of sides of triangles in miles.	Origin to Terminus.	Difference of level in feet at ground level mark-stone.	Lengths of sides of triangles in miles.	Origin to Terminus.	Difference of level in feet at ground level mark-stone.
12·85	Kadar to Nár, ..	− 26·021	11·71	Hazára to Múgo, ..	− 2·063
12·85	Nár to Kadar, ..	+ 26·005	9·93	Múgo to Bála, ..	+ 18·518
			11·53	Bála to Hazára, ..	− 16·587
25·70		− 0·006	33·17		− 0·132
12·85	Kadar to Nár, ..	− 26·021			
14·53	Nár to Kothiála, ..	+ 28·173	9·93	Múgo to Bála, ..	+ 18·518
11·61	Kothiála to Kadar, ..	− 2·249	10·21	Bála to Sháhjamál, ..	+ 7·243
			9·12	Sháhjamál to Múgo, ..	− 25·756
38·99		− 0·097	29·26		+ 0·005
12·85	Kadar to Nár, ..	− 26·021			
13·28	Nár to Jeto, ..	− 27·274	9·12	Sháhjamál to Múgo, ..	− 25·756
12·04	Jeto to Kadar, ..	+ 53·093	10·74	Múgo to Fatti, ..	+ 16·910
			11·78	Fatti to Sháhjamál, ..	+ 8·813
38·17		− 0·202	31·64		− 0·033
11·98	Jeto to Hazára, ..	− 18·630			
13·92	Hazára to Gúnia, ..	+ 38·673	10·74	Múgo to Fatti, ..	+ 16·910
10·98	Gúnia to Jeto, ..	− 19·984	10·89	Fatti to Húján, ..	− 20·991
			11·46	Húján to Múgo, ..	+ 4·146
36·88		+ 0·059	33·09		+ 0·065
10·53	Nár to Gúnia, ..	− 7·094			
10·98	Gúnia to Jeto, ..	− 19·984	9·33	Múgo to Lodri, ..	− 19·375
12·04	Jeto to Kadar, ..	+ 53·093	9·27	Lodri to Húján, ..	+ 15·185
12·85	Kadar to Nár ..	− 26·021	11·46	Húján to Múgo, ..	+ 4·146
46·40		− 0·006	30·06		− 0·044
10·72	Jeto to Bála, ..	− 2·183			
11·50	Bála to Hazára, ..	− 16·587			
13·92	Hazára to Gúnia, ..	+ 38·673			
10·98	Gúnia to Jeto, ..	− 19·984			
47·12		− 0·081			

While measuring the angles of the Jeto and the Múgo polygons, Lieutenant Walker took vertical observations, not only at the time of minimum refraction, but at various hours of the day and night, with a view to determining the actual amount of the refraction at those times; for the true vertical angles would be obtained by calculation from the leveling operations, and the difference between these and the apparent angles would give the exact amount of the refraction in each instance. The results of the several determinations of the terrestrial refraction, and the practical conclusions to be derived from them, are given in detail in Appendix No. 3 to Volume II.

During the field season Mirza Sujah, some time called Sajjad, who had been employed by Lieutenant Walker on the Survey of the Northern Trans-Indus Frontier—of which an account is given at page xx—*D*. of the Introduction to the Great Indus Series, Vol. III—tendered his services for re-employment. This man was a native of Persia, and as a lad had been brought under the notice of Major Eldred Pottinger during the well known defence of Herat by that Officer. He was taken by Pottinger to Caubul, and there fell in with Colin Mackenzie by whom he was educated in English. His knowledge of both the Persian and the Pushtú languages, and the training he had already received in surveying, rendered him a very fit person for employment as an explorer in the regions beyond the limits of the British rule and influence into which Europeans could not penetrate with safety. The operations of the Kashmir Survey party, under Lieutenant T. G. Montgomerie, R.E., were then approaching those limits, and on Lieutenant Walker's recommendation, the Government of India was pleased to "sanction the entertainment" of the Mirza, "for employment in the "geographical operations in progress on the Kashmir Frontier." Pending the completion of the Kashmir Survey up to the point where his services could best be utilized, he was allowed to remain with Lieutenant Walker, and was employed in tower building and line cutting.

Had the Mirza joined the Kashmir Survey as originally contemplated, he would doubtless have been the first of the little band of Trans-Himalayan explorers who, mainly under the directions of Major—now Lieut.-Colonel—Montgomerie, have done such good service in adding to our knowledge of the geography of the extensive—and formerly but little known—belt of country, which extends from the western passes of Afghanistan, through the valleys of the Upper Oxus, through the regions covered by the Hindú Kúsh, the Mústágh, the Kara Koram and the Kuen Lun ranges and their great spurs, through the Pamir lands situated on the long fabled Roof of the World, and through portions of Eastern Turkestan and Great Thibet, up to a point considerably to the east of Lhása. But though he eventually made a most successful exploration in those regions, and finally lost his life in them while employed in similar duties, he was not the first explorer. After remaining for some time with Lieutenant Walker, he went on leave of absence to Caubul, where he obtained a situation as teacher of English to the sons of Sher Ali, who was then the reigning Amir of Afghanistan; nor was it until some years afterwards, when his friend and patron was temporarily dethroned, that he returned to India, and sought re-employment in the Survey Department. He was then sent on an exploration through Northern Afghanistan and the Pámir to Kashghar, the account of which was written by Major Montgomerie, and first published in an appendix to the General Report on the Operations of this Survey for the year 1869-70, but has since been republished in Volume XLI (1870) of the Journal of the Royal Geographical Society. In 1872-73 he was sent on a second exploration, and was at work somewhere between Maimána and Bokhara, when he, and his son-in-law who was accompanying him, were both treacherously murdered by their guides, during the night while they were asleep. Thus the name of this faithful and intelligent emissary of this Survey has been added to the roll of the many victims who have sacrificed their lives in the cause of geographical science.

At the end of the recess following the field season of 1855-56 the entire personnel of the party employed on the Jogí-Tílá Series was altered, under instructions from Colonel Waugh. Lieutenant Walker, a majority of the European assistants, and the whole of the native establishment, were transferred to the Great Indus Series; Mr. Shelverton was transferred to the Kashmir Survey; and Lieutenant Tennant, who had latterly been employed on the Great Indus Series, was transferred with his party to the Jogí-Tílá.

Season 1856-57.

PERSONNEL.

Lieutenant J. Tennant, R.E.
„ E. M. H. Brownlow, R.E.
Mr. J. W. Armstrong.
„ E. T. Donnelly, Sub-Assistant.
„ J. Smith, „
„ M. C. Hickie, „

The existing records of the operations of the field season of 1856-57 are very meagre and deficient in detail. It appears that the annual report was not prepared as usual in the following recess, for the great Military Rebellion of the Sepoys of the Bengal Army had then broken out, and the Executive Officer—Lieutenant Tennant—had been sent to join the Army which was engaged in the Seige of Dehli.

Work was commenced with the measurement of the principal angles at Roshishání, one of the southernmost stations down to which the triangulation had been completed in the previous season. At first the observations were taken by Lieutenant Tennant, but, as the work progressed, they were entrusted to Lieutenant Brownlow, who had hitherto been employed in the Kashmir Topographical Survey, but was now sent to this Series, with a view to his acquiring a practical knowledge of observing with the large theodolites and of geodetical operations in the plains.

The instrument employed was the Barrow's 36-inch theodolite which is described briefly at page 50 of Volume II and more fully in Appendix No. 2 of the same volume. The principal angles of three polygons—the Firoz, Phosi and Dogra hexagons—were completed during the season, whereby the final operations were carried southwards a direct meridional distance of about 60 miles.

Lieutenant Tennant proceeded meanwhile to reconnoitre the great desert of Rájputána through which the triangulation, if extended to the south of the Sutlej River, would have to pass. He met with some opposition from the Sirdars of the Native State of Baháwalpur, who seemed to imagine that the survey operations were merely a prelude to the annexation of the country by the British Government. When the desert was reached, further progress was arrested by the absence of the requisite means for carrying supplies of food and water, for the use of the surveyors, while employed in this desolate and dismal region, which is uninhabited and devoid of water excepting for a short time after the cessation of the annual rains. A polygon was selected by Mr. Armstrong, but as the season advanced it was found that the supply of water had dried up at all but one of the stations; nothing more could be done in this quarter during the season, and Mr. Armstrong was therefore deputed to execute a secondary triangulation along the Ravi River.

Very shortly after the return of the party to the Head Quarters at Dehra Dún the great mutiny of the Bengal native Army broke out. Lieutenant Tennant volunteered his services for military employment and served throughout the seige of Delhi and was also present at the Relief of Lucknow. Lieutenant Brownlow had meanwhile been re-transferred to the Kashmir Survey, and was far away in Thibet when he first heard of the rebellion; he hurried down in an almost incredibly short time to Dehli, but arrived after the capture of the city; joining the force which was immediately afterwards sent down country, he was present in the actions before Agra and Fatehgarh, and eventually proceeded to Lucknow, where he was unfortunately killed by the blowing up of a tumbril; by his death the public service and the corps to which he had the honor of belonging sustained the loss of a very able and gallant officer.

In consequence of the generally disturbed state of the country through which the operations of the following field season would have to be carried, in November 1857 the party was transferred—under the charge of Mr. Armstrong—to Upper Sind, and employed under Lieutenant Walker in the operations of the Great Indus Series.

No attempt was subsequently made to carry the Jogí-Tílá Series across the desert of Rájputána down to the Karáchi Longitudinal Series, as had been prescribed in the original programme of the operations. Colonel Waugh appears to have been induced, by Lieutenant Tennant's representations of the difficulties which were likely to be met with in crossing the great desert, to conclude that the triangulation should stop at the Sutlej River, at least for the present; he therefore caused a series of triangles—the Sutlej Series—to be carried along that river from the Great Indus to the Gurhágarh Meridional Series, in order to tie up the Jogí-Tílá Series, and to form a basis for future triangulations into the deserts of Sind and Rájputána.

The southernmost polygonal figure of the Jogí-Tílá Series is the hexagon of which the central station is Akbar-da-Búnga and the remaining stations are situated three on the north and three on the south bank of the Sutlej River. The measurement of the angles of this figure was performed by Mr. George Shelverton with Troughton and Simms' 36-inch theodolite, in the field season of 1862-63, in the course of the operations on the Sutlej Series.

Before concluding the account of the principal operations it is necessary to advert to the measures which were carried out with a view to correcting the value of the initial azimuth of the Series (at the station of Jogí-Tílá), for the errors which had been generated in the triangulation from Kaliánpúr—the initial azimuth station of the North-West Quadrilateral—and to investigating the influence of the Himalayan attraction, in accordance with Colonel Waugh's instructions given at page v—*G*.

These instructions prescribed that azimuth observations should be taken at a few stations, situated near the meridian of the Series, at distances of about 50 miles apart; that the results should be compared with the values computed through the triangulation from Kaliánpúr, and that if—after getting beyond the influence of the attraction of the Himalayan Mountains—a constant difference between the observed and the computed values was met with, it should be treated as the accumulated error in azimuth generated between Kaliánpúr and Jogí-Tílá, and be applied as a correction to the initial azimuth at Jogí-Tílá. With a view also to throw light on the subject of the mountain attraction, latitude observations were to be taken at Murree—the recess quarters of the party—to the north, and at the two southernmost stations at which the attraction on the prime vertical might be found to disappear.

The stoppage of the Series, as it was about to enter the desert plains of Rájputána, of course prevented Colonel Waugh's instructions from being carried out in their entirety. Astronomical observations were taken, for the determination of the latitude at Murree by Lieutenants Walker and Basevi, and for the determination of the azimuth at Akbar (Station XIX) by Lieutenant Tennant; and eventually azimuths were also observed at two stations of the Sutlej Series which are situated on opposite sides of the Jogí-Tílá Meridian, and within half a degree in longitude; at the first—Mandresa (XXX)—by Lieutenant Herschel, and at the second—Jhambherá (XXXIII)—by Mr. Shelverton. But the results of these observations have not been made use of in the manner which was originally contemplated. When the final reduction of the North-West Quadrilateral was taken in hand, some years afterwards, it was found that, owing to the errors to which all astronomical determinations of latitude and of azimuth are liable—from the deflection of the plumb line under the influence of local attraction, and that not only in the vicinity of great mountain ranges but on level plains far from any hills—the triangulation of this Survey could not be fitted into accordance

with the astronomical facts of observation, without a liability to introduce errors of far greater magnitude than those which are probably generated in the course of the measurements of the angles and the base-lines. Thus the reduction has been conducted solely on the data furnished by the linear and the angular measurements comprehended within the Quadrilateral. The astronomically obtained data, of all stations but the origin, have been reserved for future investigations of the figure of the earth and of local attraction.

The differences between the observed azimuths at the stations above specified, and the values obtained by computation from Kaliánpúr, after the general reduction of the whole of the angles of the Quadrilateral (as explained in detail in Vol. II), are as follow

At Akbar,	station	XIX	of Jogí-Tílá Series;	Observed—Computed	=	− 0″·84
„ Mandresa,	„	XXX	of Sutlej Series;	„ „	=	− 0 ·03
„ Jhambherá,	„	XXXIII	„	„ „	=	− 3 ·51

Secondary triangulation in connection with the operations of the Jogí-Tílá Series.

Some secondary points were laid down as usual by operations with the great theodolite at the principal stations, but of these the number was not very considerable, as the stations lay for the most part on the bárs of the Doábs, whereas the most important secondary points were situated in the vicinity of the rivers.

Secondary chains of triangles were therefore carried along the Ravi and the Chenab Rivers. Of these the most important is one which was executed by Mr. J. W. Armstrong, with a 14-inch theodolite, in 1861-62; it was carried from the principal side Kájkot-Khángarwála westwards, over a distance of about 80 miles, following approximately the south-east bank of the river Ravi and the line of the Lahore and Mooltan Railway; this series was extended northwards for a distance of about 130 miles, in 1862-63, by Mr. F. Bell, with a 12-inch theodolite, along both banks of the river Chenab, and was made to close on the principal side Chiniout-Húján. Mr. Armstrong unfortunately did not construct permanent marks at his stations, and consequently these have all been lost; in the course of his operations however he fixed the positions of certain permanently marked points in the towns of Harappá, Checháwatní, Tulamba, and Makdúmpur &c; the positions of these points have been given in the synoptical volume for this Series, but as the stations of the triangulation can no longer be found their data have been omitted. Mr. Bell's stations were substantially marked; full details of their positions as well as the permanent points fixed in the country through which the triangulation was carried, have therefore been given in the Synoptical Volume. The errors generated in this triangulation, between the initial and terminal principal sides, have been duly dispersed.

In 1856-57 a triangulation was carried up the Ravi River by Mr. Armstrong, with a 12-inch theodolite. It was commenced at the principal side Mega-Roshisháni and eventually closed on the Gurhágarh Meridional Series. The errors generated between the initial and terminal sides have been duly dispersed. Full details of the portion of this triangulation which lies to the west of the meridian of 74° 17′ are given in the Synoptical Volume for this Series, and of the portion to the east in the Synoptical Volume for the Gurhágarh Series.

J. T. WALKER.

October 1875.

NUMERICAL LIST OF STATIONS.

I	Mámúdeh.	XXVIII	Nára.
II	Johárki.	XXIX	Khúrnawála.
III	Chúrawála.	XXX	Shá-Kot.
IV	Jhúlán.	XXXI	Sángla.
V	Dhabbar.	XXXII	Chiniout.
VI	Kot-Baksha.	XXXIII	Asrúr.
VII	Akbar-da-Búnga.	XXXIV	Húján.
VIII	Moní-Dhai.	XXXV	Fatti.
IX	Pák-Patan.	XXXVI	Múgo.
X	Pír-Ghani.	XXXVII	Lodri.
XI	Dogra.	XXXVIII	Sháhjamál.
XII	Malka.	XXXIX	Hazára.
XIII	Farídpúr.	XL	Bála.
XIV	Kájkot.	XLI	Jeto.
XV	Kadiánwála.	XLII	Gúnia.
XVI	Phosi.	XLIII	Sadúlapúr.
XVII	Khángarwála.	XLIV	Nár.
XVIII	Pindi.	XLV	Kadar.
XIX	Akbar.	XLVI	Kothiála.
XX	Sátgarra.	XLVII	Chail.
XXI	Firoz.	XLVIII	Ker.
XXII	Búrála.	XLIX	Koár.
XXIII	Mega.	L	Roatála.
XXIV	Rurálla.	XXXVI	Jogí-Tílá. (of N.W. Himalaya Series.)
XXV	Roshisháni.	XXXVIII	Jáolí. (of N.W. Himalaya Series.)
XXVI	Mohárawála.		
XXVII	Rirána.		

ALPHABETICAL LIST OF STATIONS.

JOGI-TILA MERIDIONAL SERIES.

DESCRIPTION OF STATIONS.

I. Mámúdeh Tower Station, lat. 29° 55′, long. 73° 21′, is situated in the naibkardari of Chaveka, kardari of Bháwalgarh, state of Bháwalpúr, on a ridge of sand, about two miles south-west of certain cattle-sheds, after which the station is called. There is no village to be seen within a radius of ten miles of the trigonometrical point.

The pillar is perforated; its height above the mark-stone is 14·29 feet.

II. Johárki Tower Station, lat. 29° 57′, long. 73° 31′, is situated in the thana of Mirizawála, kardari of Bhatír, state of Bikanír, on a sand ridge, about two and a-half miles west by south of the little village of Dhanúr.

The pillar is perforated; its height above the mark-stone is 10·73 feet.

III. Chúrawála Tower Station, lat. 30° 4′, long. 73° 26′, is situated in the naibkardari of Chaveka, kardari of Bháwalgarh, state of Bháwalpúr, about three miles south by east of the little village of Máchiwála-búnga.

The pillar is perforated; its height above the mark-stone is 30·69 feet.

IV. Jhúlán Tower Station, lat. 30° 3′, long. 73° 17′, is situated in the thana of Chaveka, kardari of Bháwalgarh, state of Bháwalpúr, about a quarter of a mile to the south of the little village of Jhúlán.

The pillar is perforated; its height above the mark-stone is 20·10 feet.

V. Dhabbar Tower Station, lat. 30° 3′, long. 73° 39′, is situated in the kardari of Bháwalgarh, state of Bháwalpúr, on a sand hill, about a quarter of a mile south by west of the little village of Dhabbar.

The pillar is perforated; its height above the mark-stone is 23·93 feet.

VI. Kot-Baksha Tower Station, lat. 30° 11′, long. 73° 19′, is situated in the village so called, in the thana of Tibbi, pargana and tahsil of Pák-Patan, zilla Gúgaira.

The pillar is perforated; its height above the mark-stone is 30·10 feet.

VII. Akbar-da-Búnga Tower Station, lat. 30° 13′, long. 73° 31′, is situated in the thana and kardari of Bháwalgarh, state of Bháwalpúr, about half a mile to the south-west of the village of Akbar-da-Búnga.

The pillar is perforated; its height above the mark-stone is 29·12 feet.

VIII. Moní-Dhai Tower Station, lat. 30° 13′, long. 73° 43′, is situated in the naibkardari of Ramúka, kardari of Bháwalgarh, state of Bháwalpúr, on somewhat elevated ground, about three and a-half miles south by east of the village of Hassanwála, and about five miles south by east of the village of Rateka.

The pillar is perforated; its height above the mark-stone is 30 19 feet.

IX. Pák-Patan Tower Station, lat. 30° 21′, long. 73° 26′, is situated in zilla Gúgaira, at the northern extremity of the important town of that name, which stands on a mound of great height, in all probability produced by the accumulation of *débris*, since the size of the mound is identical with that of the town, which is of great antiquity.

The pillar is perforated; in 1857 its height above the mark-stone was 27·86 feet, which was increased to 34·67 in 1862-63, when the triangulation was extended southwards.

X. Pír-Ghani Tower Station, lat. 30° 23′, long. 73° 38′, is situated in pargana Pák-Patan, zilla Gúgaira, close to the old bank of the Sutlej, about a mile and a-half from the present bed of that river, and one hundred yards south of the Mooltan and Ferozpoor road.

The pillar is perforated; its height above the mark-stone is 32·17 feet.

XI. Dogra Tower Station, lat. 30° 31′, long. 73° 28′, is in the centre of a small village of the same name, situated in zilla Gúgaira, pargana Pák-Patan.

The pillar is perforated; its height above the mark-stone is 31·58 feet.

XII. Malka Tower Station, lat. 30° 26′, long. 73° 19′, is situated about a mile to the N.N.E. of the village of that name in zilla Gúgaira, pargana Pák-Patan.

The pillar is perforated; its height above the mark-stone is 30·67 feet.

XIII. Farídpúr Tower Station, lat. 30° 31′, long. 73° 39′, is situated about two hundred yards to the westward of the village of that name in zilla Gúgaira, pargana Pák-Patan.

The pillar is perforated; its height above the mark-stone is 31·48 feet.

XIV. Kájkot Tower Station, lat. 30° 38′, long. 73° 19′, is situated on the extreme edge of the old high bank of the river Beas, about one hundred yards north of the district road

between Chíchawatni and Daspúr, in the pargana Fattipúr, zilla Gúgaira. There is a well about a mile to the south-west.

The pillar is perforated; its height above the mark-stone is 24·92 feet.

XV. Kadiánwála Tower Station, lat. 30° 38′, long. 73° 31′, is situated in the kadir land, on the left or southern side of the old bed of the river Beas, in the pargana of Pák-Patan, zilla Gúgaira. The nearest village, called Kacha Paha. lies about two miles to the eastward.

The pillar is perforated; its height above the mark-stone is 26·13 feet.

XVI. Phosi Tower Station, lat. 30° 45′, long. 73° 28′, is on the summit of a mound twenty-three feet above the surrounding country, on the edge of the old bank of the river Beas, and overlooks the tract of kadir land extending to the present bed of the Sutlej. Zilla Gúgaira, pargana Fattipúr.

The pillar is perforated; its height above the mark-stone is 22·38 feet.

XVII. Khángarwála Tower Station, lat. 30° 45′, long. 73° 17′, is situated on an open spot in the jungle, near the northern edge of the high ground forming the watershed of the Baree Doab, and about two miles from the village bearing the same name, which is the nearest place where water is procurable. Zilla Gúgaira, pargana Fattipúr.

The tower is perforated; its height above the mark-stone is 30·80 feet.

XVIII. Pindi Tower Station, lat. 30° 47′, long. 73° 39′, stands on the edge of the old high bank of the river Beas, and overhangs the well-cultivated kadir land extending to the Sutlej. Zilla Gúgaira, pargana Pák-Patan.

The pillar is perforated; its height above the mark-stone is 31·67 feet.

XIX. Akbar Platform Station, lat. 30° 54′, long. 73° 20′, is on a mound nearly seventy feet high, about a quarter of a mile to the south of the village of Akbar, and the same distance to the north of the dâk bungalow and encamping ground. It is situated in the zilla of Gúgaira, pargana Fattipúr, in the kadir land of the river Ravi.

The pillar is solid, and raised about 3 feet above the surface of mound.

XX. Sátgarra Tower Station, lat. 30° 55′, long. 73° 33′, is situated on a high mound about 0·3 mile south-west of the large town of the same name, and immediately south of the ruins of the old town. It is in pargana Fattipúr, zilla Gúgaira.

The pillar is perforated; its height above the mark-stone is 20·60 feet, and 51 feet above the general level of the surrounding country.

XXI. Firoz Platform Station, lat. 31° 3′, long. 73° 28′, is situated on a high mound immediately to the north of the village of the same name, and about 0·2 of a mile distant from the road from Gúgaira to Saiadwála. It is in the thana of Chúchak, pargana Fattipúr, zilla

Gúgaira. The village of Pír-Alli, on the river bank, is fourteen miles to the west, and Jandrápi 2·47 miles to the north-east.

The pillar is solid; its surface is about 53 feet above the level of the surrounding country.

XXII. Búrála Tower Station, lat. 31° 6′, long. 73° 16′, is situated in an open part of the jungle, north of the river Ravi, close to a well of the same name. It is situated in the pargana and thana of Saiadwála, in the zilla of Gúgaira.

The pillar is perforated; its height above the mark-stone is 32·2 feet.

XXIII. Mega Tower Station, lat. 31° 5′, long. 73° 42′, is situated about half a mile north of the village of the same name in thana Chúchak, pargana Fattipúr, zilla Gúgaira. The road runs close to the village of Mega, and the village of Chúchak is about 1·8 miles distant, nearly in the ray to Sátgarra.

The pillar is perforated; its height above the mark-stone is 32·67 feet.

XXIV. Rurálla Tower Station, lat. 31° 13′, long. 73° 24′, is built on the lands of the Rurálla jhok; thana and tahsil Saiadwála, zilla Gúgaira. There is no village within a radius of five miles.

The pillar is perforated; its height above the mark-stone is 29·75 feet.

XXV. Roshisháni Tower Station, lat. 31° 14′, long. 73° 35′, is on the plain near the village of that name; thana and tahsil Saiadwála, zilla Gúgaira.

The pillar is perforated; its height above the mark-stone is 37·42 feet. The azimuths and distances of circumjacent villages are as follows:—Roshisháni, 56° 27′; mile, 0·228. Dolchi, 190° 27′; mile, 1·984.

XXVI. Mohárawála Tower Station, lat. 31° 23′, long. 73° 27′, is erected on a bastion in the north face of the old fort of Mohárawála; thana Búchú, tahsil Saiadwála, zilla Gúgaira.

The pillar is raised 8·4 feet above the bastion, and about 42 feet above the ground level.

XXVII. Rirána Tower Station, lat. 31° 21′, long. 73° 16′, is in the lands of the Rirána jhok; thana Shá-Kot, tahsil Chiniout, zilla Jhung. There is no village within a radius of ten miles.

The pillar is perforated; its height above the mark-stone is 29·67 feet.

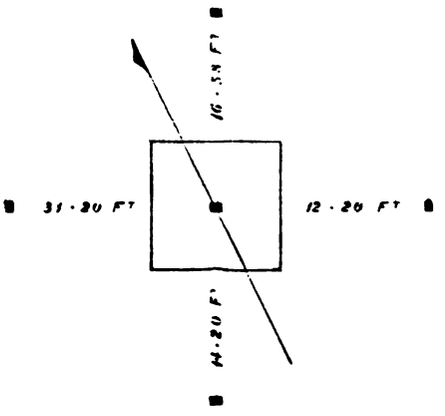
XXVIII. Nára Tower Station, lat. 31° 25′, long. 73° 37′, is on a high mound, the probable site of an ancient town, in the lands of the Nára jhok; thana Búchú, tahsil Saiadwála, zilla Gúgaira. The nearest village is Nankhána, about seven miles to the east.

The pillar is perforated; its height above the mark-stone is 11·48 feet.

XXIX. Khúrnawála Tower Station, lat. 31° 30′, long. 73° 19′, in the lands of the Khúrnawála jhok, is in the thana of Shá-Kot, tahsil Chiniout, zilla Jhung. There is no village within a radius of many miles.

The pillar is perforated; its height above the mark-stone is 30·38 feet.

XXX. Shá-Kot Hill Station, lat. 31° 34′, long. 73° 30′, is on the southernmost ridge of the hills west of the village of Shá-Kot, where there is a thana of the Jhung district.



The pillar is solid, and raised about 4 feet above the summit of the hill. Four marks have been engraved on the rocks around, at the distances indicated in the sketch, and in such positions that the diagonals of the quadrilateral intersect each other over the station mark. The azimuth of the village of Shá-Kot is 252° 29′, and distance ·7 mile.

XXXI. Sángla Hill Station, lat. 31° 43′, long. 73° 26′, is on the summit of the well-known hills of that name in the centre of the Bár of the Rechna Doab; thana Pindi Bhatián, tahsil Háfizábád, zilla Gújranwála.

The pillar is solid, and raised about 2 feet above the hill summit.

XXXII. Chiniout Hill Station, lat. 31° 44′, long. 73° 1′, is on the summit of the hill overhanging the town of Chiniout; tahsil Chiniout, zilla Jhung.

The pillar is solid, and raised about 4 feet above the hill summit.

XXXIII. Asrúr Tower Station, lat. 31° 47′, long. 73° 41′, stands on the north side of a high mound in the village of that name, near the shrine of Míyán-Alli; thana and tahsil Shekhúpúra, zilla Gújranwála.

The pillar is solid, and raised about 8 feet above the surface of the mound.

XXXIV. Húján Tower Station, lat. 31° 52′, long. 73° 21′, is built on the ridge near the village of Húján, two miles S.E. of the town of Pindi Bhatián; tahsil Háfizábád, zilla Gújranwála.

The pillar is perforated; its height is 15·90 feet above the mark-stone. The azimuths and distances of circumjacent villages, &c., are as follows:—Nakka-kot, 298° 4′; mile, 2·135. Húján, 30° 4′; mile, ·780. A Revenue Survey tri-junction pillar 121° 8′; mile ·204

XXXV. Fatti Tower Station, lat. 31° 52′, long. 73° 32′, is on a mound so called, by the side of the road between Pindi Bhatián and Lahore; choki Sakú, thana Pindi Bhatián, tahsil Háfizábád, zilla Gújranwála.

The pillar is perforated; its height is 25·66 feet above the mark-stone. The azimuths and distances of circumjacent villages are as follows:—Súkho, 136° 26′; mile, 1·019. Súkho Sarai, 116° 56′; mile, 1·149. Náwa, 75° 26′; mile, 1·665.

XXXVI. Múgo Tower Station, lat. 32° 1′, long. 73° 27′, is built on an isolated ruined tower, a few yards west of the village Múgo; choki Jalálpúr, thana Pindi Bhatián, tahsil Háfizábád, zilla Gújranwála.

The pillar is solid; its height is 36·20 feet above a masonry bench-mark, built at the foot of the old tower on which the station stands, as a point of reference for the spirit-leveling operations of the Trigonometrical Survey. The azimuths and distances of circumjacent villages are as follows:—Khúshiál Kot, 261° 18′; mile, 1·428. Matora, 322° 18′; mile, 1·408. Ranawál, 120° 38′; mile, ·802.

XXXVII. Lodri Tower Station, lat. 32° 0′, long. 73° 18′, stands in the lowlands on the left bank of the river Chenab; thana Pindi Bhatián, tahsil Háfizábád, zilla Gújranwála.

The pillar is perforated; its height is 17·85 feet above the mark-stone. The azimuths and distances of circumjacent villages are as follows:—Chota Lodri, 242° 10′; mile, ·300. Bara Lodri, 287° 10′; mile, ·780. Murád-Baksh-ka-Killa, 356° 10′; mile, 1·786.

XXXVIII. Sháhjamál Tower Station, lat. 32° 2′, long. 73° 36′, is situated a few yards west of the village so called; thana and tahsil Háfizábád, zilla Gújranwála.

The pillar is perforated; its height is 25·24 feet above the mark-stone. The azimuths and distances of circumjacent villages are as follows:—Láliwál, 297° 45′; mile, 1·115. Sarápwál, 180° 45′; mile, 1·130.

XXXIX. Hazára Tower Station, lat. 32° 8′, long. 73° 18′, is on the bank of a channel of the river Chenab, two miles north of the old town of Takht Hazára; thana Midh, tahsil Kálúwál, zilla Sháhpúr.

The pillar is perforated; its height is 30·61 feet above the mark-stone. The azimuths and distances of circumjacent villages are as follows:—Takht Hazára, 43° 17′; mile, 1·911. Mián Hazára, 77° 17′; mile, 1·617. Udi, 188° 47′; mile, ·706.

XL. Bála Tower Station, lat. 32° 9′, long. 73° 30′, is situated in the north-west corner of the village of Nawa Bála (or Bála Khúrd); thana and tahsil Háfizábád, zilla Gújranwála, about two hundred yards W. of the new military road between Mooltan and Wazírabad.

The pillar is perforated; its height above the mark-stone is 28·77 feet. The azimuths and distances of circumjacent villages are as follows:—Purána Bála, 93° 28′; mile, ·791. Múzaffar, 175° 28′; mile, 1·650. Chíni, 249° 28′; mile, 1·032. Gájaranwál, 0° 28′; mile, 1·338.

XLI. Jeto Tower Station, lat. 32° 17′, long. 73° 25′, is situated in the centre of the village so called; thana Kádirábád, tahsil Phalián, zilla Goojrat.

The pillar is perforated; its height above the mark-stone is 34·30 feet. The azimuths and distances of circumjacent villages are as follows:—Pindi, 152° 34′; mile, 1·769. Barra Dhúni, 200° 19′; mile, 1·425. Jajour, 93° 19′; mile, 2·232.

XLII. Gúnia Tower Station, lat. 32° 19′, long. 73° 14′, is situated on a high ridge near the village so called; thana Músa, tahsil Bhera, zilla Sháhpúr.

The pillar is perforated; its height above the mark-stone is 24·20 feet. The azimuths and distances of circumjacent villages are as follows:—Gúndal Miáni, 149° 59′; mile, 4·259. Pindi, 14° 59′; mile, 2·379. Gúnia, 1° 59′; mile, ·552.

XLIII. Sadúlapúr Tower Station, lat. 32° 15′, long. 73° 38′, is situated in the centre of the village so called; choki Vaníká, thana and tahsil Háfizábád, zilla Gújranwála.

The pillar is perforated; its height above the mark-stone is 26·20 feet. The azimuths and distances of circumjacent villages are as follows:—Kádírpúr, 181° 33′; mile, 1·679. Pír Mahamad-ke-Kot, 221° 45′; mile, 1·359. Vanika (western gateway), 15° 46′; mile, 2·315.

XLIV. Nár Tower Station, lat. 32° 27′, long. 73° 19′, is situated on a mound so called;

0·85 of a mile W. of the hamlet Mal. The nearest large village is Rúkan, lying south, at a distance of two miles. Nár is in thana Bhikí, tahsil Bhera, and zilla Sháhpúr.

The pillar is perforated; its height above the mark-stone is 30·80 feet. As the station had to be revisited, four mark-stones were sunk in the ground to a depth of about two feet, at the base of the tower,—one pair opposite the entrances to the vault, the other pair at right angles to the first, so that lines joining them intersect each other over the station mark. The azimuths and distances of circumjacent villages are as follows :—Bahowál, 139° 16′; mile, 3·317. Mal, 253° 48′; mile, ·853. Chota Rúkan, 356° 8′; mile, 2·025.

XLV. Kadar Tower Station, lat. 32° 25′, long. 73° 32′, is situated on the high bank of the naka, overhanging the kadir lands of the Chenab. It is about two hundred yards N.E. of the village of Kadar, in thana Soháwa, tahsil Phalián, zilla Goojrat.

The pillar is perforated; its height above the mark-stone is 19·65 feet. As the station had to be revisited, four mark-stones were sunk, one at each angle of the tower, forming a quadrilateral whose diagonals intersect over the station mark.

XLVI. Kothiála Tower Station, lat. 32° 35′, long. 73° 30′, is situated to the S. of the village of Kothiála, 2·6 miles north of Soháwa thana. It belongs to thana Bhikí, tahsil Bhera, and zilla Shahpúr.

The pillar is perforated; its height above the mark-stone is 30·36 feet. The azimuths and distances of circumjacent villages are as follows :—Basú, 325° 56′; mile, 2·34. Sohawa, 354° 36′; mile, 2·59. Kálúwál, 172° 26′; mile, 1·82. Allí, 95° 56′; mile, 3·26.

XLVII. Chail Hill Station, lat. 32° 47′, long. 73° 8′.—Chail is a well-known hill north of Pind Dadun Khan, and east of the Choya Pass through the Salt range. It is immediately above the village of Bashárat, which is situated on one of the highest plateaux of the range. From Bashárat to the top of Chail a road has been made for the theodolite. There are two roads through the hills to Bashárat,—one from Choya, the other from Jalálpúr, *viâ* Bághánwála and Arí; the latter is much the best of the two. The station is on the summit of the hill, among sundry buildings, tenanted by fakirs; thana Choya, tahsil Pind Dadun Khan.

The pillar is solid, and raised about 3 feet above the summit of the hill.

XLVIII. Ker Tower Station, lat. 32° 31′, long. 73° 39′.—This station is situated on the summit of Ker Shivala, a flat-roofed Hindoo tomb, near the village Jaisúk, of thana Soháwa, tahsil Phalián, and zilla Goojrat.

The pillar is solid, and raised 7·2 inches above the flat roof of the Shivala.

XLIX. Koár Hill Station, lat. 32° 47′, long. 73° 44′.—This station was originally selected by Lieutenant Robinson for the survey of the Rawul Pindi and Jhelum districts. Lieut. Robinson's pillar having been made for a 12-inch theodolite, was of too small a diameter, and required to be increased, which was done, care being taken to preserve the mark-stone from displacement. The station is situated on the low range east of the river Jhelum, a few miles south of the Khárián Pass. It is named after the nearest large village, Koár, of choki Púran, thana Nowrangabád, tahsil Khárián, zilla Goojrat. The hill road between Koár and Dingi passes within a few yards of the station.

The pillar is solid, and raised about 2 feet above the summit of the hill.

L. Roatála Hill Station, lat. 33° 11′, long. 73° 38′, is situated on the summit of the high sandstone range between the Bakrála range and the river Jhelum, at a distance of about 2 miles N.E. of the village of Lehri, and about the same distance S.E. of Panchore; thana Deena, tahsil Jhelum.

The pillar is solid, and raised about 2 feet above the summit of the hill.

XXXVI.—*(Of North-West Himalaya Series).* Jogí-Tílá Hill Station, lat. 32° 52′, long. 73° 29′, is situated on the well-known hill of that name in thana and tahsil Rhotás, district Jhelum. The station is about 100 yards S.E. of the large temple, and nearly the same distance E. of the smaller one.

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

XXXVIII.—*(Of North-West Himalaya Series).* Jáolí Hill Station, lat. 33° 17′, long. 73° 13′, is situated on a small hill about 1½ mile N. of the large and well-known town of Súkho, in the pargana, thana, and tahsil of Súkho, district Rawul Pindi. The small village after which the station is named is about ¼ of a mile to the south.

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

NOTE.—Consequent on modern alterations of district and other boundaries, the sites occupied by the stations are now included in civil divisions of territory which differ frequently from the district, pargana or village, recorded in the preceding descriptions of stations: a suitably modified statement of the sub-divisions in question is accordingly given in the following table and is derived chiefly from the annual reports, up to 1874, made by the Civil Officials to whose care the stations have been committed.

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

No.	Local name	District	Pargana, &c.	Village	Remarks
I	†	Bháwalpúr ...	Kárdári Bháwalgarh Náibkárdári Chaveka		
II		Bikanír ...	Kárdári Bhatír Thá. Mirzáwála		
III		Bháwalpúr ...	Kárdári Bháwalgarh Náibkárdári Chaveka		
IV		„ ...	Kárdári Bháwalgarh Thá. Chaveka	Jhúlán	
V		„ ...	Kárdári Bháwalgarh	Dhabbar	
VI	...	Montgomery (old Gugaira)	Police station Tibbi Par. Pák-Patan	Kot-Baksha	
VII	†	Bháwalpúr ...	Kárdári and Thá. Bháwalgarh	Akbar-da-Búnga	
VIII		„ ...	Kárdári Bháwalgarh Náibkárdári Ramúka		
IX	...	Montgomery (old Gugaira)	Police station Pák-Patan	Pák-Patan	
X	...	„ ...	„ „	Pír-Ghani	
XI	...	„ ...	„ „	Dogra	
XII	...	„ ...	„ „	Malka Háns	
XIII	...	„ ...	„ Depálpúr	Faridpúr	
XIV	...	„ ...	„ Montgomery	Kachkota	
XV	...	„ ...	„ Depálpúr	Kadiánwála	
XVI	...	„ ...	„ Montgomery	Bhosi	
XVII	...	„ ...	„ „	Khángranwála	
XVIII	...	„ ...	Par. Pák-Patan		
XIX	...	„ ...	Police station Gugaira	Akbar	
XX	...	„ ...	„ Chúchák	Sátgarra	
XXI	...	„ ...	„ „	Firoz	
XXII	...	„ ...	„ Bálak	Búrala	
XXIII	...	„ ...	„ Chúchák	Mega	
XXIV	...	„ ...	„ Saiyidwála	Rorána	
XXV	...	„ ...	„ „	Roshisháni	

NOTE.—Tah. stands for Tahsíl, Thá. for Thánah and Par. for Pargana.
† No reports received from the Civil Officials in whose districts these stations lie.

No.	Local name.	District	Pargana, &c.	Village	Remarks
XXVI	...	Montgomery (old Gugaira)	Police station Saiyidwála	Moháranwála	
XXVII	Rirána ...	Jhang ...	Tah. Chiniout	Rirána	
XXVIII	...	Montgomery (old Gugaira)	Police station Saiyidwála	Nára	
XXIX	Khariánwála...	Jhang ...	Tah. Chiniout	Khariánwála	
XXX	Sháhkote ...	„ ...	Tah. Chiniout Thá. Sháhkot	Sháhkot	
XXXI	Sángla ...	Gújeránwálah ...	Tah. Súkheki Thá. Pindi Bhatián Par. Háfizábád	Sángla	
XXXII	Chiniout ...	Jhang ...	Tah. Chiniout	Chiniout	
XXXIII	Khánga Assúr	Gújeránwálah ...	Tah. Shekhopúra Par. Háfizábád	Khánga Assúr	
XXXIV	Húján ...	„	Tah. Súkheki Par. Háfizábád	Húján	
XXXV	Fattiki ...	„	Tah. Súkheki Par. Háfizábád	Fattiki	
XXXVI	Mughaki ...	„	Tah. Súkheki Par. Háfizábád	Mughaki	
XXXVII	Ludhna ...	„	Tah. Pindi Bhatián Par. Háfizábád.	Ludhna	
XXXVIII	Sháhjamál ...	„	Tah. and Par. Háfizábád	Sháhjamál	
XXXIX	Huzára ...	Sháhpúr ...	Tah. and Par. Bhera Thá. Kotmomin	Tukht Hazára	
XL	Báláki Now ...	Gújeránwálah ...	Tah. Vaníka Par. Háfizábád	Báláki Now	
XLI	Gar Ganj ...	Gujrát ...	Tah. Phálián Thá. Kothiála Shekhán	Cheto	
XLII	Gúnia ...	Sháhpúr ...	Tah. and Par. Bhera Thá. Miánágondal	Gúnia	
XLIII	Sadúlapúr ...	Gújeránwálah ...	Tah. Vaníka Par. Háfizábád	Sadúlapúr	
XLIV	Mal ...	Sháhpúr ...	Tah. and Par. Bhera Thá. Miánágondal	Mal	
XLV	Gar Ganj ...	Gujrát ...	Tah. Phálián Thá. Kothiála Shekhán	Kadar	
XLVI	Gar Ganj ...	„	Tah. Phálián Thá. Kothiála Shekhán	Kothiála Saidán	
XLVII	Bashárat ...	Jhilam ...	Tah. Pind Dadun Khán Thá. Choia	Bashárat	

NOTE.—Tah. stands for Tahsíl, Thá. for Thánah and Par. for Pargana.

No.	Local name	District	Pargana, &c.	Village	Remarks
XLVIII	Gadi Guru Nának or Ker	Gujrát ...	Tah. Phálián Thá. Pahrián-wáli.	Jaika alias Ker	
XLIX	Dheri ...	„	Tah. and Thá. Khárián	Kohár	
L	...	Jhilam ...	Police station Soháwa.	Rotála	
XXXVI	Jogí-Tíla ...	„	Thá. Jalálpúr	Bheth	Of N. W. Himalaya Series.
XXXVIII	Jwálá-ki-Dheri	Ráwal Pindí ...	Thá. Jatli	Jwála	Do.

NOTE.—Tah. stands for Tahsíl, Thá. for Thánah and Par. for Pargana.

February 1874. J. B. N. H.

JOGI-TILA MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION.

TRIANGLES.

No. of triangle	Station	Spherical excess	Corrected plane angle	Distance			No. of triangle	Station	Spherical excess	Corrected plane angle	Distance		
				Log. feet	Feet	Miles					Log. feet	. Feet	Miles
		"	° ′ ″						"	° ′ ″			
	V	·31	53 29 0·84	4·8044839	63750·6	12·074		II	·20	68 37 9·11	4·7697494	58850·4	11·146
1	VIII	·32	65 23 41·12	4·8580559	72120·0	13·659	6	III	·20	58 52 33·72	4·7332163	54102·4	10·247
	VII	·32	61 7 18·04	4·8417266	69458·7	13·155		I	·20	52 30 17·17	4·7002111	50143·1	9·497
	VIII	·31	67 3 14·02	4·8553407	71670·5	13·574		III	·20	57 13 13·49	4·7253162	53127·1	10·062
2	VII	·31	57 57 0·96	4·8193262	65966·9	12·494	7	I	·20	54 8 9·67	4·7093493	51209·4	9·699
	X	·30	54 59 45·02	4·8044839	63750·6	12·074		IV	·20	68 38 36·84	4·7697494	58850·4	11·146
	VII	·27	57 59 30·84	4·8042854	63721·4	12·068		IV	·18	70 57 14·37	4·7501352	56251·6	10·654
3	X	·27	49 30 2·22	4·7569528	57141·7	10·822	8	III	·17	49 40 13·14	4·6567301	45366·0	8·592
	IX	·28	72 30 26·94	4·8553407	71670·5	13·574		VI	·17	59 22 32·49	4·7093493	51209·4	9·699
	VII	·29	59 24 46·56	4·8179346	65755·9	12·454		III	·25	70 1 8·14	4·8180764	65777·4	12·458
4	V	·28	49 49 20·00	4·7661234	58361·1	11·053	9	VI	·24	56 29 44·46	4·7661234	58361·1	11·053
	III	·29	70 45 53·44	4·8580559	72120·0	13·659		VII	·24	53 29 7·40	4·7501352	56251·6	10·654
	V	·21	48 17 47·28	4·7002111	50143·1	9·497		VI	·28	49 15 20·43	4·7569528	57141·7	10·822
5	III	·21	53 26 56·75	4·7320177	53953·3	10·218	10	VII	·28	70 2 14·49	4·8505846	70889·9	13·426
	II	·21	78 15 15·97	4·8179346	65755·9	12·454		IX	·28	60 42 25·08	4·8180764	65777·4	12·458

NOTE.—The stations I, II, III, IV, V, VII and VIII are common to the Jogí-Tílá Meridional and Sutlej Series.

No. of triangle	Station	Spherical excess	Corrected plane angle	Distance			No. of triangle	Station	Spherical excess	Corrected plane angle	Distance		
				Log. feet	Feet	Miles					Log. feet	Feet	Miles
		"	° ′ ″						"	° ′ ″			
	X	·29	56 37 21·20	4·8018622	63366·9	12·001		XX	·29	67 4 35·34	4·8497036	70746·3	13·399
11	IX	·29	66 15 54·36	4·8417614	69464·3	13·156	23	XIX	·28	47 44 56·34	4·7547847	56857·1	10·768
	XI	·29	57 6 44·44	4·8042854	63721·4	12·068		XXI	·29	65 10 28·32	4·8433220	69714·3	13·203
	IX	·21	56 7 15·93	4·7371547	54595·2	10·340		XIX	·34	53 6 40·34	4·8210266	66225·7	12·543
12	XI	·20	49 23 3·16	4·6982572	49918·0	9·454	24	XXI	·35	68 11 44·33	4·8858062	76878·7	14·560
	XII	·21	74 29 40·91	4·8018622	63366·9	12·001		XXII	·34	58 41 35·33	4·8497036	70746·3	13·399
	XII	·25	60 31 37·03	4·7966124	62605·5	11·857		XXII	·29	60 52 7·79	4·8160528	65471·6	12·400
13	XI	·26	70 4 46·43	4·8300049	67609·1	12·805	25	XXI	·28	57 3 18·84	4·7986491	62899·8	11·913
	XIV	·25	49 23 36·54	4·7371547	54595·2	10·340		XXIV	·29	62 4 33·37	4·8210266	66225·7	12·543
	XI	·22	71 9 0·89	4·8118617	64842·8	12·281		XXI	·27	46 4 41·64	4·7444948	55525·8	10·516
14	XIV	·21	42 49 32·63	4·6681636	46576·2	8·821	26	XXIV	·28	75 47 8·03	4·8734845	74728·2	14·153
	XV	·22	66 1 26·48	4·7966124	62605·5	11·857		XXV	·28	58 8 10·33	4·8160528	65471·6	12·400
	X	·23	55 28 45·70	4·7663510	58391·7	11·059		XX	·31	63 5 19·37	4·8634026	73013·4	13·828
15	XI	·23	45 57 11·08	4·7070552	50939·6	9·648	27	XXI	·32	72 55 56 89	4·8936193	78274·3	14·825
	XIII	·23	78 34 3·22	4·8417614	69464·3	13·156		XXIII	·31	43 58 43·74	4·7547847	56857·1	10·768
	XI	·20	66 19 12·60	4·7653788	58261·1	11·034		XXI	·33	50 33 48·14	4·8001318	63114·9	11·954
16	XIII	·19	47 3 54·54	4·6681636	46576·2	8·821	28	XXIII	·34	66 7 33·74	4·8734845	74728·2	14·153
	XV	·20	66 36 52·86	4·7663510	58391·7	11·059		XXV	·33	63 18 38·12	4·8634026	73013·4	13·828
	XV	·23	69 21 37·73	4·8149357	65303·4	12·368		XXIV	·24	70 4 27·61	4·8156906	65417·0	12·390
17	XIV	·22	42 19 35·61	4·6719892	46988·2	8·899	29	XXV	·24	56 59 15·21	4·7660303	58348·6	11·051
	XVI	·22	68 18 46·66	4·8118617	64842·8	12·281		XXVI	·24	52 56 17·18	4·7444948	55525·8	10·516
	XIV	·22	60 18 43·06	4·7708512	58999·9	11·174		XXV	·26	48 8 46·22	4·7372458	54606·7	10·342
18	XVI	·21	45 37 40·90	4·6861575	48546·5	9·194	30	XXVI	·27	68 41 22·17	4·8344182	68299·6	12·936
	XVII	·22	74 3 36·04	4·8149357	65303·4	12·368		XXVIII	·26	63 9 51·61	4·8156906	65417·0	12·390
	XVII	·24	72 59 24·33	4·8255683	66921·9	12·675		XXVIII	·28	72 16 1·07	4·8595057	72361·2	13·705
19	XVI	·23	49 32 44·51	4·7263361	53252·0	10·086	31	XXVI	·27	61 46 43·71	4·8256863	66940·1	12·678
	XIX	·24	57 27 51·16	4·7708512	58999·9	11·174		XXX	·27	45 57 15·22	4·7372458	54606·7	10·342
	XVI	·31	64 22 7·52	4·8433220	69714·3	13·203		XXVI	·29	56 55 29·56	4·8100590	64574·2	12·230
20	XIX	·30	55 41 36·01	4·8053070	63871·5	12·097	32	XXX	·29	53 11 24·17	4·7902683	61697·6	11·685
	XX	·30	59 56 16·47	4·8255683	66921·9	12·675		XXIX	·30	69 53 6·27	4·8595057	72361·2	13·705
	XV	·20	58 16 26·32	4·7539662	56750·0	10·748		XXIV	·25	57 1 3·26	4·7696752	58840·3	11·144
21	XVI	·21	76 57 21·79	4·8129018	64998·3	12·310	33	XXVI	·25	66 41 44·06	4·8090367	64422·4	12·201
	XVIII	·20	44 46 11·89	4·6719892	46988·2	8·899		XXVII	·25	56 17 12·68	4·7660303	58348·6	11·051
	XVI	·23	55 11 17·21	4·7499505	56227·7	10·649		XXVI	·22	52 58 21·78	4·7309347	53818·9	10·193
22	XVIII	·24	68 51 2·90	4·8053070	63871·5	12·097	34	XXVII	·23	66 14 14·08	4·7902683	61697·6	11·685
	XX	·23	55 57 39·89	4·7539662	56750·0	10·748		XXIX	·23	60 47 24·14	4·7696752	58840·3	11·144

No. of triangle	Station	Spherical excess	Corrected plane angle	Distance			No. of triangle	Station	Spherical excess	Corrected plane angle	Distance		
				Log. feet	Feet	Miles					Log. feet	Feet	Miles
		"	° ′ ″						"	° ′ ″			
	XXIX	·28	41 49 53·78	4·7521852	56517·8	10·704		XL	·25	65 8 18·37	4·8010406	63247·1	11·979
35	XXX	·29	88 31 34·77	4·9279524	84713·5	16·044	47	XXXIX	·24	54 15 51·41	4·7526831	56582·6	10·716
	XXXI	·29	49 38 31·45	4·8100590	64574·2	12·230		XLI	·25	60 35 50·22	4·7833903	60728·2	11·502
	XXX	·38	62 3 32·24	4·9370204	86500·9	16·383		XXXIX	·27	49 28 33·24	4·7632009	57969·7	10·979
36	XXXI	·39	82 41 10·30	4·9873002	97118·1	18·394	48	XLI	·28	74 29 37·64	4·8662090	73486·7	13·918
	XXXIII	·38	35 15 17·46	4·7521852	56517·8	10·704		XLII	·28	56 1 49·12	4·8010406	63247·1	11·979
	XXXIII	·31	49 27 20·97	4·8183463	65818·3	12·466		XLII	·25	76 13 52·09	4·8458596	70122·9	13·281
37	XXXI	·31	43 28 13·06	4·7751618	59588·4	11·286	49	XLI	·24	50 21 28·51	4·7450385	55595·4	10·529
	XXXV	·31	87 4 25·97	4·9370204	86500·9	16·383		XLIV	·25	53 24 39·40	4·7632009	57969·7	10·979
	XXXI	·26	52 20 29·26	4·7597699	57513·5	10·893		XLI	·31	60 47 7·94	4·8316421	67864·4	12·853
38	XXXV	·26	62 42 10·95	4·8099546	64558·7	12·227	50	XLIV	·30	54 48 46·18	4·8030955	63547·1	12·035
	XXXIV	·27	64 57 19·79	4·8183463	65818·3	12·466		XLV	·31	64 24 5·88	4·8458596	70122·9	13·281
	XXIX	·79	72 24 40·86	5·1054228	127474·4	24·143		XL	·24	79 16 26·07	4·8524138	71189·1	13·483
39	XXXI	·79	68 16 51·27	5·0942358	124232·7	23·529	51	XLI	·24	49 22 47·69	4·7403352	54996·5	10·416
	XXXII	·79	39 18 27·87	4·9279524	84713·5	16·044		XLIII	·24	51 20 46·24	4·7526831	56582·6	10·716
	XXXI	·58	63 34 42·04	5·0585303	114427·5	21·672		XLI	·32	64 23 6·36	4·8577765	72073·6	13·650
40	XXXII	·58	30 20 53·95	4·8099546	64558·7	12·227	52	XLIII	·32	52 39 33·67	4·8030955	63547·1	12·035
	XXXIV	·58	86 4 24·01	5·1054228	127474·4	24·143		XLV	·32	62 57 19·97	4·8524138	71189·1	13·483
	XXXV	·23	63 58 52·72	4·7818497	60513·2	11·461		XLV	·32	72 39 29·74	4·8847561	76693·1	14·525
41	XXXIV	·23	57 21 27·70	4·7535988	56702·1	10·739	53	XLIV	·31	49 42 22·40	4·7873359	61282·4	11·607
	XXXVI	·23	58 39 39·58	4·7597699	57513·5	10·893		XLVI	·31	57 38 7·86	4·8316421	67864·4	12·853
	XXXIV	·18	52 13 25·79	4·6927041	49283·8	9·334		XLIV	·79	74 59 42·90	5·1349360	136438·2	25·841
42	XXXVI	·18	51 43 34·90	4·6897553	48950·3	9·271	54	XLVI	·78	72 7 13·97	5·1285041	134432·4	25·461
	XXXVII	·19	76 2 59·31	4·7818497	60513·2	11·461		XLVII	·78	32 53 3·13	4·8847561	76693·1	14·525
	XXXVII	·18	79 17 12·74	4·7913014	61844·5	11·713		XLVI	·85	53 37 2·14	5·0459227	111153·4	21·052
43	XXXVI	·18	49 10 34·69	4·6778757	47629·5	9·021	55	XLVII	·84	45 11 25·54	4·9910114	97951·6	18·551
	XXXIX	·18	51 32 12·57	4·6927041	49283·8	9·334		XXXVI*	·85	81 11 32·32	5·1349360	136438·2	25·841
	XXXVI	·23	63 35 16·00	4·7833903	60728·2	11·502		XLVII	1·47	68 27 2·80	5·2391575	173443·3	32·849
44	XXXIX	·23	50 37 3·68	4·7194078	52409·2	9·926	56	XXXVI*	1·47	74 57 37·45	5·2554900	180090·2	34·108
	XL	·23	65 47 40·32	4·7913014	61844·5	11·713		XXXVIII*	1·46	36 35 19·75	5·0459227	111153·4	21·052
	XXXV	·20	47 31 33·16	4·6827300	48164·8	9·122		XLV	·20	54 47 34·36	4·7218579	52705·7	9·982
45	XXXVI	·21	72 12 36·87	4·7936404	62178·5	11·776	57	XLVI	·20	53 23 44·90	4·7141901	51783·4	9·807
	XXXVIII	·20	60 15 49·97	4·7535988	56702·1	10·739		XLVIII	·21	71 48 40·74	4·7873359	61282·4	11·607
	XXXVI	·18	64 38 16·75	4·7315055	53889·7	10·206		XLVI	·41	74 30 27·53	5·0059570	101381·1	19·201
46	XXXVIII	·18	61 29 50·72	4·7194078	52409·2	9·926	58	XLVIII	·41	75 25 37·02	5·0078284	101818·9	19·284
	XL	·18	53 51 52·53	4·6827300	48164·8	9·122		XLIX	·40	30 3 55·45	4·7218579	52705·7	9·982

NOTE.—The Stations marked * appertain to the North-West Himalaya Series.

No. of triangle	Station	Spherical excess	Corrected plane angle	Distance			No. of triangle	Station	Spherical excess	Corrected plane angle	Distance		
				Log. feet	Feet	Miles					Log. feet	Feet	Miles
		"	° ′ ″						"	° ′ ″			
	XLVI	·59	48 43 20·46	4·9163384	82478·1	15·621		XXXVI	1·29	49 18 12·76	5·1204413	131959·7	24·992
59	XLIX	·59	63 11 26·59	4·9910114	97951·6	18·551	61	L	1·29	85 13 3·61	5·2391575	173443·3	32·849
	XXXVI	·59	68 5 12·95	5·0078284	101818·9	19·284		XXXVIII	1·28	45 28 43·63	5·0937560	124095·5	23·503
	XLIX	·80	58 52 10·34	5·0937560	124095·5	23·503							
60	XXXVI	·81	86 27 19·51	5·1604545	144695·3	27·404							
	L	·80	34 40 30·15	4·9163384	82478·1	15·621							

NOTE.—XXXVI and XXXVIII appertain to the North-West Himalaya Series.

J. B. N. HENNESSEY.

JOGI-TILA MERIDIONAL SERIES.

PRINCIPAL TRIANGULATION.

LATITUDES, LONGITUDES, AZIMUTHS AND HEIGHTS.

The following table gives, in the first column, the (numerical) names and the co-ordinates of the successive principal stations taken in order from the stations I II, . . . the initial stations of the series, and thence through the triangulation northwards to the stations XXXVI and XXXVIII of the North-West Himalaya Series; in the second column the azimuths at the stations in the first to the surrounding stations are given, and in the third the distinguishing numbers of the triangles—pages 11—*a*. and following—which contain the distances between the central and the surrounding stations.

NOTE.—λ stands for Latitude North; L for Longitude East of Greenwich; H for Height of station in feet above mean sea level, if determined trigonometrically, and H_s for the Height when found by spirit leveling; *h* stands for Height of station tower or pillar in feet.

A description of the exact point referred to by spirit leveling will be found in a foot note on page 18—*a*.; trigonometrical heights are invariably referred to the upper surface of the pillar. When the pillar is perforated or the tower is hollow, *h* represents the height of the upper surface above the mark-stone on the ground level; in all other cases *h* stands for the height of the station above the general ground level.

Station and its co-ordinates	Azimuths of surrounding stations	Reference to triangle containing distance	Station and its co-ordinates	Azimuths of surrounding stations	Reference to triangle containing distance
	° ′ ″			° ′ ″	
I	IV 155 1 50·93	7	III	I 29 12 43·99	6
λ 29 55 25·19	III 209 10 0·80	6	λ 30 3 53·80	IV 86 25 57·67	7
L 73 20 59·48	II 261 40 18·17	6	L 73 26 25·91	VI 136 6 10·99	8
H 569			H 558	VII 206 7 19·38	4
h 14			*h* 31	V 276 53 13·11	4
				II 330 20 10·07	5
II	I 81 45 21·83	6	IV	VI 195 23 51·77	8
λ 29 56 42·38	III 150 22 31·14	5	λ 30 3 21·90	III 266 21 6·32	7
L 73 31 8·01	V 228 37 47·32	5	L 73 16 44·25	I 334 59 43·36	7
H 577			H 534		
h 11			*h* 20		

NOTE.—The stations I, II, III, IV, V and VII, are common to the Sutlej and Jogí-Tila Meridional Series.

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
V	° ′ ″		° ′ ″	
	λ 30 2 35·16	II	48 41 37·64	5
	L 73 38 48·74	III	96 59 25·13	4
	H 610	VII	146 48 45·41	1
	h 24	VIII	200 17 46·56	1
VI		IV	15 25 0·64	8
	λ 30 10 34·85	IX	210 17 22·56	10
	L 73 19 1·50	VII	259 32 43·28	9
	H 557	III	316 2 27·97	8
	h 30			
VII		III	26 9 46·42	4
	λ 30 12 32·43	VI	79 38 54·06	9
	L 73 31 18·78	IX	149 41 8·83	3
	H_s 538·35	X	207 40 39·94	2
	h 29	VIII	265 37 41·21	1
		V	326 44 59·57	1
VIII		V	20 20 4·44	1
	λ 30 13 19·98	VII	85 43 45·88	1
	L 73 43 23·39	X	152 47 0·20	2
	H 593			
	h 30			
IX		VI	30 20 48·22	10
	λ 30 20 40·63	XII	134 44 44·85	12
	L 73 25 49·59	XI	190 52 0·99	11
	H 651	X	257 7 55·64	3
	h 35	VII	329 38 22·87	3
X		VII	27 43 51·71	2
	λ 30 23 0·57	IX	77 13 54·19	3
	L 73 37 38·90	XI	133 51 15·68	11
	H 589	XIII	189 20 1·61	15
	h 32	VIII	332 44 6·38	2
XI		IX	10 53 10·17	11
	λ 30 30 56·62	XII	60 16 13·53	12
	L 73 28 6·18	XIV	130 21 0·21	13
	H 594	XV	201 30 1·33	14
	h 32	XIII	267 49 14·12	15
		X	313 46 25·44	11
XII		XIV	179 40 1·52	13
	λ 30 26 28·30	XI	240 11 38·80	12
	L 73 19 4·54	IX	314 41 19·92	12
	H 563			
	h 31			

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
XIII	° ′ ″		° ′ ″	
	λ 30 31 18·12	X	9 20 49·49	15
	L 73 39 13·37	XI	87 54 52·93	15
	H 597	XV	134 58 47·66	16
	h 31			
XIV		XVII	164 48 30·50	18
	λ 30 37 37·53	XVI	225 7 13·78	17
	L 73 19 0·05	XV	267 26 49·61	14
	H 595	XI	310 16 22·44	13
	h 25	XII	359 39 59·24	13
XV		XI	21 31 40·73	14
	λ 30 38 5·54	XIV	87 33 7·43	14
	L 73 31 21·60	XVI	156 54 45·39	17
	H 587	XVIII	215 11 11·91	21
	h 26	XIII	314 54 47·66	16
XVI		XIV	45 11 44·48	17
	λ 30 45 13·35	XVII	90 49 25·58	18
	L 73 27 50·41	XIX	140 22 10·33	19
	H 629	XX	204 44 18·15	20
	h 22	XVIII	259 55 35·59	21
		XV	336 52 57·59	17
XVII		XIX	197 44 15·24	19
	λ 30 45 21·25	XVI	270 43 39·81	18
	L 73 16 34·24	XIV	344 47 16·07	18
	H 602			
	h 31			
XVIII		XV	35 14 51·20	21
	λ 30 46 51·16	XVI	80 1 3·28	21
	L 73 38 31·01	XX	148 52 6·43	22
	H 634			
	h 32			
XIX		XVII	17 45 50·67	19
	λ 30 53 43·26	XXII	163 44 45·65	24
	L 73 19 40·46	XXI	216 51 26·33	23
	H 641	XX	264 36 22·95	20
	h 3	XVI	320 17 59·27	19
XX		XVI	24 46 55·43	20
	λ 30 54 47·44	XIX	84 43 12·20	20
	L 73 32 57·27	XXI	151 47 47·83	23
	H 636	XXIII	214 53 7·51	27
	h 21	XVIII	328 49 15·31	22

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XXI	° ′ ″	XIX	36 55 37·41	23
λ	31 3 3·30	XXII	105 7 22·08	24
L	73 27 48·34	XXIV	162 10 41·21	25
H	647	XXV	208 15 23·12	26
h	†	XXIII	258 49 11·59	27
		XX	331 45 8·80	23
XXII		XXIV	224 8 54·43	25
λ	31 5 53·73	XXI	285 1 2·51	24
L	73 15 32·94	XIX	343 42 38·18	24
H	631			
h	32			
XXIII		XX	34 57 32·71	27
λ	31 5 22·69	XXI	78 56 16·77	27
L	73 41 32·18	XXV	145 3 50·85	28
H	652			
h	33			
XXIV		XXII	44 13 15·53	25
λ	31 13 20·17	XXVII	139 16 2·20	33
L	73 23 57·54	XXVI	196 17 5·71	29
H	649	XXV	266 21 33·56	26
h	30	XXI	342 8 41·87	25
XXV		XXI	28 18 53·86	26
λ	31 13 54·62	XXIV	86 27 4·47	26
L	73 34 35·85	XXVI	143 26 19·92	29
H	655	XXVIII	191 35 6·40	30
h	37	XXIII	325 0 15·41	28
XXVI		XXIV	16 18 43·76	29
λ	31 22 34·46	XXVII	83 0 28·08	33
L	73 27 6·30	XXIX	135 58 50·07	32
H	667	XXX	192 54 19·92	31
h	42	XXVIII	254 41 3·90	30
		XXV	323 22 26·34	29
XXVII		XXIX	196 40 23·14	34
λ	31 21 23·08	XXVI	262 54 37·45	33
L	73 15 52·68	XXIV	319 11 50·38	33
H	637			
h	30			
XXVIII		XXV	11 36 28·70	30
λ	31 24 56·82	XXVI	74 46 20·57	30
L	73 37 14·15	XXX	147 2 21·91	31
H	690			
h	11			

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XXIX	° ′ ″	XXVII	16 41 56·14	34
λ	31 29 53·31	XXXII	131 46 49·49	39
L	73 18 51·05	XXXI	204 11 31·14	35
H	653	XXX	246 1 25·20	32
h	30	XXVI	315 54 31·77	32
XXX		XXVI	12 55 57·47	31
λ	31 34 12·51	XXIX	66 7 21·93	32
L	73 30 13·13	XXXI	154 38 56·99	35
H	771	XXXIII	216 42 29·61	36
h	4	XXVIII	326 58 41·98	31
XXXI		XXIX	24 15 1·76	35
λ	31 42 37·92	XXXII	92 31 53·82	39
L	73 25 32·97	XXXIV	156 6 36·44	38
H	839	XXXV	208 27 5·96	37
h	2	XXXIII	251 55 19·33	36
		XXX	334 36 30·02	35
XXXII		XXXIV	241 58 4·02	40
λ	31 43 31·28	XXXI	272 18 58·54	39
L	73 0 58·32	XXIX	311 37 27·20	39
H	835			
h	4			
XXXIII		XXX	36 48 22·83	36
λ	31 47 2·58	XXXI	72 3 40·67	36
L	73 41 25·76	XXXV	121 31 1·95	37
H	740			
h	8			
XXXIV		XXXII	62 8 21·29	40
λ	31 52 22·00	XXXVII	161 31 42·72	42
L	73 20 29·74	XXXVI	213 45 8·70	41
H	671	XXXV	271 6 36·63	38
h	16	XXXI	336 3 56·69	38
XXXV		XXXI	28 30 17·55	37
λ	31 52 10·49	XXXIV	91 12 28·75	38
L	73 31 36·63	XXXVI	155 11 21·70	41
H	702	XXXVIII	202 42 55·06	45
h	26	XXXIII	301 25 51·27	37
XXXVI		XXXIV	33 48 35·30	41
λ	32 0 39·77	XXXVII	85 32 10·38	42
L	73 27 0·26	XXXIX	134 42 45·25	43
H	695	XL	198 18 1·48	44
h	36	XXXVIII	262 56 18·41	45
		XXXV	335 8 55·49	41

† Not forthcoming.

Station and its co-ordinates	Azimuths of surrounding stations		Reference to triangle containing distance
		° ′ ″	
XXXVII	XXXIX	186 9 55·02	43
° ′ ″	XXXVI	265 27 7·94	42
λ 32 0 1·45	XXXIV	341 30 7·44	42
L 73 17 29·62			
H 658			
h 18			
XXXVIII	XXXV	22 45 22·66	45
λ 32 1 38·03	XXXVI	83 1 12·83	45
L 73 36 15·56	XL	144 31 3·72	46
H 710			
h 25			
XXXIX	XXXVII	6 10 26·60	43
λ 32 7 50·08	XLII	160 16 44·78	48
L 73 18 29·11	XLI	209 45 18·49	47
H 692	XL	264 1 9·94	44
h 31	XXXVI	314 38 13·85	43
XL	XXXVI	18 19 43·15	44
λ 32 8 52·15	XXXIX	84 7 23·70	44
L 73 30 11·69	XLI	149 15 42·32	47
H 706	XLIII	228 32 8·63	51
h 29	XXXVIII	324 27 50·43	46
XLI	XXXIX	29 48 33·19	47
λ 32 16 53·31	XLII	104 18 11·10	48
L 73 24 34·78	XLIV	154 39 39·85	49
H 714	XLV	215 26 48·10	50
h 34	XLIII	279 49 54·79	51
	XL	329 12 42·72	47
XLII	XLIV	207 58 28·93	49
λ 32 19 14·56	XLI	284 12 21·27	48
L 73 13 40·11	XXXIX	340 14 10·67	48
H 724			
h 24			
XLIII	XL	48 36 24·36	51
λ 32 14 52·28	XLI	99 57 10·84	51
L 73 38 11·63	XLV	152 36 44·83	52
H 733			
h 26			
XLIV	XLII	28 1 11·97	49
λ 32 27 20·34	XLVII	155 5 39·44	54
L 73 18 44·50	XLVI	230 5 23·13	53
H 737	XLV	279 47 45·84	50
h 31	XLI	334 36 32·32	49

Station and its co-ordinates	Azimuths of surrounding stations		Reference to triangle containing distance
		° ′ ″	
XLV	XLI	35 30 38·21	50
° ′ ″	XLIV	99 54 44·40	50
λ 32 25 25·41	XLVI	172 34 14·46	53
L 73 31 44·79	XLVIII	227 21 49·02	57
H 752	XLIII	332 33 17·93	52
h 20			
XLVI	XLIV	50 11 32·85	53
λ 32 35 26·74	XLVII	122 18 47·60	54
L 73 30 12·16	XXXVI*	175 55 50·59	55
H 765	XLIX	224 39 11·64	58
h 30	XLVIII	299 9 39·58	57
	XLV	352 33 24·68	53
XLVII	XXXVIII*	188 28 7·32	56
λ 32 47 26·42	XXXVI*	256 55 11·58	55
L 73 7 41·25	XLVI	302 6 37·96	54
H 3687	XLIV	334 59 41·87	54
h 3			
XLVIII	XLV	47 25 47·91	57
λ 32 31 12·28	XLVI	119 14 28·86	57
L 73 39 9·75	XLIX	194 40 6·30	58
H 772			
h †			
XLIX	XLVIII	14 42 48·59	58
λ 32 47 22·70	XLVI	44 46 44·43	58
L 73 44 10·51	XXXVI*	107 58 11·61	59
H 1367	L	166 50 22·75	60
h 2			
L	XXXVI*	21 27 22·68	60
λ 33 10 36·68	XXXVIII*	106 40 27·58	61
L 73 37 42·87	XLIX	346 46 51·73	60
H 2147			
h 2			
XXXVI*	XLVII	77 6 39·70	55
λ 32 51 33·55	XXXVIII*	152 4 18·63	56
L 73 28 50·66	L	201 22 32·67	60
H 3200	XLIX	287 49 52·99	59
h 2	XLVI	355 55 6·53	55
XXXVIII*	XLVII	8 30 57·65	56
λ 33 16 48·84	L	286 26 51·53	61
L 73 12 53·69	XXXVI*	331 55 36·44	56
H 1918			
h 2			

* When determining the spirit leveled height of VII or Akbar-da-Búnga Tower Station, given on page 16—*a*., the leveling staff stood on the mark-stone let into the ground floor of the tower.

NOTE.—The stations marked * appertain to the North-West Himalaya Series. † Not forthcoming.

J. B. N. HENNESSEY.

JOGI-TILA MERIDIONAL SERIES.

SECONDARY TRIANGULATION. TRIANGLES.

PRINCIPAL-AUXILIARY STATIONS AND INTERSECTED POINTS.

The following symbols are adopted

(D)—to indicate that the common side of two triangles differed before correction by less than 2 feet per mile.

(E)— ditto ditto ditto ditto by more than 2 feet per mile.

(?)—to indicate that one of the triangles is evidently erroneous, and therefore no adjustment has been made.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	I	42 30 4	4·569976	37151	7·036	36
62	IV	62 27 17	4·688033	48757	9·234	,,
	Mosque No. 1 (D)		4·725316	53127	10·062	
	IV	77 8 35	4·714733	51848	9·820	,,
63	VI	44 18 47	4·569976	37151	7·036	,,
	Mosque No. 1 (D)		4·656730	45366	8·592	
	III	82 15 0	4·832326	67971	12·873	,,
64	VI	42 39 48	4·667342	46488	8·805	,,
	Bháwalgarh Fort (D)		4·750135	56252	10·654	
	VI	63 5 17	4·861465	72688	13·767	,,
65	IX	56 29 42	4·832326	67971	12·873	,,
	Bháwalgarh Fort (D)		4·850585	70890	13·426	
	VII	92 39 21	4·852201	71154	13·476	,,
66	IX	34 0 11	4·600264	39835	7·544	,,
	Pír Khális Khángáh (D)		4·756953	57142	10·822	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	IX	38 30 16	4·653429	45022	8·527	36
67	X	79 42 52	4·852201	71154	13·476	,,
	Pír Khális Khángáh (D)		4·804285	63721	12·068	
	VI	56 1 11	4·771258	59055	11·185	,,
68	IX	28 29 19	4·531086	33969	6·434	,,
	Kalíáná Flag		4·850585	70890	13·426	
	VI	29 39 35	4·558650	36195	6·855	,,
69	IX	46 4 46	4·721693	52686	9·978	,,
	Paká Sidhárá Flag		4·850585	70890	13·426	
	IX	5 52 32	3·793033	6209	1·176	,,
70	XII	49 30 31	4·663970	46129	8·736	,,
	Malká Village Flag		4·698257	49918	9·454	
	IX	53 39 30	4·715079	51889	9·828	,,
71	X	44 46 53	4·656836	45377	8·594	,,
	Shámgarh Flag (D)		4·804285	63721	12·068	

NOTE.—1. Stations denoted by Roman Numerals are Principal Stations, excepting when followed by the letters h.s., s., or t.s.
2. The values of the side are given in the same line with the opposite angle.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
72	X	67 19 14	4·755877	57000	10·796	36
	XIII	57 8 4	4·715079	51889	9·828	,,
	Shámgarh Flag (D)		4·707055	50940	9·648	
73	X	46 34 11	4·577752	37823	7·163	12
	XIII	55 27 15	4·632444	42899	8·125	7
	Havelí s.	77 58 34	4·707055	50940	9·648	,,
74	XIII	59 15 31	4·585516	38505	7·293	,,
	Havelí s.	63 8 57	4·601734	39970	7·570	,,
	Bungá (heliotrope)		4·577752	37823	7·163	
75	XI	12 55 31	4·460211	28854	5·465	36
	XIII	13 59 20	4·493921	31183	5·906	,,
	Bungá Flag		4·766351	58392	11·059	
76	X	43 46 28	4·644788	44135	8·359	,,
	XIII	83 14 27	4·801765	63353	11·999	,,
	Daular Fort (D)		4·707055	50940	9·648	
77	XIII	42 23 31	4·594339	39295	7·442	,,
	XV	49 13 19	4·644788	44135	8·359	,,
	Daular Fort (D)		4·765379	58261	11·034	
78	XI	48 59 29	4·711598	51475	9·749	,,
	XIII	9 52 46	4·068331	11704	2·217	,,
	Dharrí Flag (D)		4·766351	58392	11·059	
79	XIII	37 11 9	4·551143	35575	6·738	,,
	XV	60 59 28	4·711598	51475	9·749	,,
	Dharrí Flag (D)		4·765379	58261	11·034	
80	XI	18 48 0	4·331215	21439	4·061	,,
	XIII	42 34 2	4·653239	45003	8·523	,,
	Sukhpúr Flag		4·766351	58392	11·059	
81	XI	42 48 3	4·608259	40575	7·685	,,
	XIII	35 6 15	4·535817	34341	6·504	,,
	Sháh Ikká s. (D)		4·766351	58392	11·059	
82	XI	23 31 10	4·309258	20383	3·860	,,
	XV	42 14 56	4·535817	34341	6·504	,,
	Sháh Ikká s. (D)		4·668164	46576	8·821	
83	XI	9 52 0	4·453125	28387	5·376	,,
	XIV	12 20 15	4·548969	35397	6·704	,,
	Nautheh Flag		4·796612	62605	11·857	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
84	XI	21 11 10	4·366988	23280	4·409	36
	XIII	93 47 35	4·808049	64276	12·173	,,
	Pír Gadá Red Tomb		4·766351	58392	11·059	
85	XI	40 8 35	4·578173	37859	7·170	,,
	XIII	55 57 21	4·687164	48659	9·216	,,
	Kachá Paká Flag (D)		4·766351	58392	11·059	
86	XI	25 10 38	4·335698	21662	4·103	,,
	XV	82 17 8	4·687164	48659	9·216	,,
	Kachá Paká Flag (D)		4·668164	46576	8·821	
87	XIII	24 40 57	4·443133	27742	5·254	,,
	XV	36 35 57	4·597785	39608	7·502	,,
	Lálúpúr Flag		4·765379	58261	11·034	
88	XV	100 57 33	4·900399	79506	15·058	,,
	XVI	43 34 28	4·746799	55821	10·572	,,
	Dipálpúr s. (D)		4·671989	46988	8·899	
89	XV	42 41 6	4·651224	44794	8·484	,,
	XVIII	57 39 24	4·746799	55821	10·572	,,
	Dipálpúr s. (D)		4·812902	64998	12·310	
90	XVIII	55 35 16	4·767653	58567	11·092	7
	Dipálpúr s.	85 17 21	4·849733	70751	13·400	,,
	Hujrá ,,	39 7 23	4·651224	44794	8·484	,,
91	XVIII	34 37 44	4·620107	41697	7·897	,,
	Hujrá s.	39 59 46	4·673593	47162	8·932	,,
	Shergarh Tomb		4·849733	70751	13·400	
92	XVI	30 14 39	4·503021	31844	6·031	36
	XVIII	85 54 20	4·799752	63060	11·943	,,
	Tomb in Jungle		4·753966	56750	10·748	
93	XVI	13 12 44	4·290108	19503	3·694	,,
	XVIII	125 6 5	4·843935	69813	13·222	,,
	Jíwan Sing Flag		4·753966	56750	10·748	
94	XX	80 20 26	4·752253	56527	10·706	,,
	XXI	2 13 18	3·346902	2223	0·421	,,
	Sátgarra Town Flag		4·754785	56857	10·768	
95	XXI	62 57 58	4·769570	58826	11·141	,,
	XXIV	34 34 12	4·573719	37473	7·097	,,
	Saiyidwálá s. (D)		4·816053	65472	12·400	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XXIV	41 12 56	4·606023	40367	7·645	36
96	XXV	73 46 52	4·769570	58826	11·141	12
	Saiyidwálá s. (D)		4·744495	55526	10·516	
	XX	52 29 10	4·671619	46948	8·892	36
97	XXI	53 38 48	4·678232	47669	9·028	,,
	Májrá Tomb Spire (D)		4·754785	56857	10·768	
	XXI	52 57 42	4·586439	38587	7·308	,,
98	Saiyidwálá s.	76 12 57	4·671619	46948	8·892	12
	Májrá Tomb Spire (D)		4·573719	37473	7·097	
	XXI	18 55 57	4·530119	33894	6·419	36
99	XXII	20 24 37	4·561468	36431	6·900	,,
	Jámbrá Flag		4·821027	66226	12·543	
	XXVIII	106 25 6	4·933349	85773	16·245	24
100	XXX	25 6 41	4·579184	37948	7·187	,,
	Nankháná Samád		4·825686	66940	12·678	
	XXVIII	80 41 8	4·938912	86879	16·454	,,
101	XXX	49 49 12	4·827782	67264	12·739	,,
	Baggá s. (D)		4·825686	66940	12·678	
	XXX	24 42 31	4·567681	36956	6·999	,,
102	Nankháná Samád		4·938912	86879	16·454	
	Baggá s. (D)	75 58 15	4·933349	85773	16·245	12
	XXXI	43 24 18	4·776040	59709	11·309	24
103	XXXV	87 21 16	4·938525	86801	16·440	,,
	Asrúr Mosque (D)		4·818346	65818	12·466	
	XXXIII	112 16 20	4·776040	59709	11·309	,,
104	XXXV	0 16 50	2·499607	316	0·060	,,
	Asrúr Mosque (D)		4·775162	59588	11·286	
	XXXI	29 49 53	4·647785	44441	8·417	,,
105	XXXV [Dome (D)	102 42 53	4·940253	87147	16·505	,,
	Dográ-kí-Kháng áh, W.		4·818346	65818	12·466	
	XXXI	13 38 20	4·314481	20629	3·907	,,
106	XXXIII [Dome (D)	84 57 48	4·940253	87147	16·505	,,
	Dográ-kí-Kháng áh, W.		4·937020	86501	16·383	
	XXXI	29 52 50	4·648983	44564	8·440	,,
107	XXXV [Dome (D)	102 44 40	4·940752	87247	16·524	,,
	Dográ-kí-Kháng áh, E.		4·818346	65818	12·466	
	XXXIII	35 48 51	4·648983	44564	8·440	Inch 24
108	XXXV [Dome (D)	15 40 14	4·313243	20570	3·896	,,
	Dográ-kí-Kháng áh, E.		4·775162	59588	11·286	
	XXXI	2 22 2	4·118216	13129	2·486	,,
109	XXXIV [(D)	165 54 50	4·888508	77358	14·651	,,
	Pindí Phatián Tomb Spire		4·809955	64559	12·227	
	XXXIV	71 46 22	4·761692	57769	10·941	,,
110	XXXVI [(D)	12 27 57	4·118216	13129	2·486	,,
	Pindí Phatián Tomb Spire		4·781850	60513	11·461	
	XXXI	2 31 56	4·124563	13322	2·523	,,
111	XXXIV [(D)	165 6 17	4·889350	77509	14·680	,,
	Pindí Phatián Kachahrí		4·809955	64559	12·227	
	XXXIV	72 34 55	4·762955	57937	10·973	,,
112	XXXVI [(D)	12 40 24	4·124563	13322	2·523	,,
	Pindí Phatián Kachahrí		4·781850	60513	11·461	
	XXXII	105 48 39	5·275240	188469	35·695	,,
113	XXXIV	38 26 41	5·085613	121790	23·066	,,
	Kiráná Tomb Dome (E)		5·058530	114427	21·672	
	XXXIV	67 14 42	5·295573	197503	37·406	,,
114	XLII	61 38 27	5·275240	188469	35·695	,,
	Kiráná Tomb Dome (E)		*5·221966	166711	31·574	
	XXXVI	41 31 37	4·591422	39032	7·392	,,
115	XL	21 22 11	4·331487	21453	4·063	,,
	Jalálpúr House		4·719408	52409	9·926	
	XXXVI	79 23 29	4·324821	21126	4·001	,,
116	Jalálpúr House		3·719967	5248	0·994	
	R. S. Platform s.	86 28 37	4·331487	21453	4·063	
	XXXIII	29 22 54	4·694028	49434	9·363	,,
117	XXXVIII	37 7 58	4·784074	60824	11·520	,,
	Sajádá Tomb		*4·965724	92411	17·502	
	XLI	15 8 36	4·389881	24540	4·648	,,
118	XLII	22 57 39	4·564028	36646	6·941	,,
	Rerká Tower		4·763201	57970	10·979	
	XLII	10 31 22	4·246269	17631	3·339	,,
119	XLIV	24 38 19	4·604730	40247	7·622	,,
	Dabhar Tower		4·745039	55595	10·529	

* Deduced base.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XLIII	5 4 38	4·006274	10146	1·922	24
120	XLV	135 58 9	4·901353	79681	15·091	,,
	Ratowál s.	38 57 13	4·857777	72074	13·650	,,
	XLVIII	105 31 1	5·029561	107044	20·273	,,
121	XLIX	8 37 7	4·221361	16648	3·153	,,
	Helá t.s.		5·005957	101381	19·201	
	XLV	21 38 58	4·326970	21231	4·021	,,
122	XLVIII	94 12 54	4·758854	57392	10·870	,,
	Tomb of Mirzá Sukálí (D)		4·714190	51783	9·807	
	XLVIII	13 1 47	3·796668	6261	1·186	,,
123	Helá t.s.	130 8 22	4·326970	21231	4·021	
	Tomb of Mirzá Sukálí (D)		4·221361	16648	3·153	
	XLVIII	24 10 3	4·131146	13525	2·562	,,
124	Helá t.s.	6 5 34	3·544866	3506	0·664	
	Revenue Survey Pillar		4·221361	16648	3·153	
	XLV	38 11 52	4·517314	32909	6·233	,,
125	XLVIII	38 28 2	4·519897	33105	6·270	,,
	Jandorá Shiválá (D)		4·714190	51783	9·807	
	XLVI	35 39 22	4·517314	32909	6·233	,,
126	XLVIII	33 20 39	4·491805	31032	5·877	,,
	Jandorá Shiválá (D)		4·721858	52706	9·982	
	XXXVI	13 22 46	4·624842	42154	7·984	,,
127	XLIV	45 21 51	5·112708	129631	24·551	,,
	Malakwál Tomb (D)		*5·192372	155730	29·494	
	XXXVI	44 15 3	4·965150	92289	17·479	,,
128	XLVII	78 33 47	5·112708	129631	24·551	,,
	Malakwál Tomb (D)		5·045923	111153	21·052	
	XLVI	14 46 1	4·729363	53624	10·156	,,
129	XLIX	14 10 40	4·712058	51530	9·759	,,
	Chilíánwálá Monument		5·007828	101819	19·284	
	XLV	3 58 47	4·649468	44614	8·450	,,
130	XLVI	170 32 59	5·023438	105545	19·990	,,
	Chambal Hill Cairn (D)		4·787336	61282	11·607	
	XLVI	61 32 48	4·952330	89605	16·971	,,
131	XLIX	25 57 38	4·649468	44614	8·450	,,
	Chambal Hill Cairn (D)		5·007828	101819	19·284	
	XXXIX	22 48 48	5·281613	191255	36·223	24
132	XLII [(D)	148 37 8	5·409694	256859	48·647	,,
	Salt Range No. 1, Dome		4·866209	73487	13·918	
	XLII	79 7 10	5·276061	188826	35·762	,,
133	XLIV [(D)	84 4 28	5·281613	191255	36·223	,,
	Salt Range No. 1, Dome		4·745039	55595	10·529	
	XXXIX	19 48 16	5·293590	196603	37·235	,,
134	XLII [(D)	152 55 12	5·421868	264161	50·030	,,
	Salt Range No. 2, Tomb		4·866209	73487	13·918	
	XLII	74 49 6	5·278264	189786	35·944	,,
135	XLIV [(D)	88 45 34	5·293590	196603	37·235	,,
	Salt Range No. 2, Tomb		4·745039	55595	10·529	
	XLII	69 51 28	5·223843	167434	31·711	,,
136	XLIV [(D)	91 58 42	5·250993	178235	33·757	,,
	Salt Range No. 3, Tomb		4·745039	55595	10·529	
	XLIV	35 5 45	4·983624	96299	18·239	,,
137	XLVII [(D)	91 31 25	5·223843	167434	31·711	,,
	Salt Range No. 3, Tomb		5·128504	134432	25·461	
	XXXIX	63 42 46	5·371336	235145	44·535	,,
138	XLI [(D)	102 19 57	5·408605	256215	48·526	,,
	Salt Range No. 4, Cairn		4·801041	63247	11·979	
	XLI	27 50 19	5·269201	185867	35·202	,,
139	XLII [(D)	143 47 12	5·371336	235145	44·535	,,
	Salt Range No. 4, Cairn		4·763201	57970	10·979	
	XLI	32 35 52	5·182254	152144	28·815	,,
140	XLII [(D)	135 33 25	5·296099	197742	37·451	,,
	Salt Range No. 5, Cairn		4·763201	57970	10·979	
	XXXIX	57 17 42	5·296099	197742	37·451	,,
141	XLI [(D)	107 5 31	5·351446	224619	42·541	,,
	Salt Range No. 5, Cairn		4·801041	63247	11·979	
	XLIV	9 26 19	4·482052	30343	5·747	,,
142	XLVII	37 9 36	5·048302	111764	21·167	,,
	Kusak Tomb (D)		5·128504	134432	25·461	
	XXXVI	12 28 20	4·482052	30343	5·747	,,
143	XLVII	115 14 6	5·104106	127089	24·070	,,
	Kusak Tomb (D)		5·045923	111153	21·052	

*Reduced base.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XLIV	8 44 44	4·312072	20515	3·885	24
144	XLVII	86 9 19	5·129116	134622	25·497	,,
	Karangal Hill Cairn (D)		5·128504	134432	25·461	
	XXXVI	55 11 28	5·129116	134622	25·497	,,
145	LXIV	53 2 27	5·117323	131016	24·814	,,
	Karangal Hill Cairn (D)		*5·192372	155730	29·494	
	XXXVI	6 10 7	4·472097	29655	5·616	,,
146	XLVII	150 4 49	5·138786	137653	26·071	,,
	Dilúr House		5·045923	111153	21·052	
	XXXVI	123 36 52	4·993288	98466	18·649	,,
147	XLVI	0 26 53	2·965962	925	0·175	,,
	Jogí-Tíla Hill Tomb (D)		4·991011	97952	18·551	
	XLVI	53 10 10	5·043256	110473	20·923	,,
148	XLVII	45 30 50	4·993288	98466	18·649	,,
	Jogí-Tíla Hill Tomb (D)		5·134936	136438	25·841	
	RAVI†					
	SECONDARY SERIES.					
	XXIII	39 11 51	4·601420	39941	7·565	36
149	XXV	47 51 28	4·670806	46860	8·875	,,
	Khánpúr s.		4·800132	63115	11·954	
	XXIII	21 15 36	4·436376	27313	5·173	12
150	Khánpúr s.	17 12 34	4·348042	22287	4·221	,,
	Alpá ,,	141 31 50	4·670806	46860	8·875	,,
	Khánpúr s.	81 9 46	4·476160	29934	5·669	,,
151	Alpá ,,	34 27 49	4·234073	17142	3·247	,,
	Sandráni ,,	64 22 25	4·436376	27313	5·173	,,
	Alpá s.	28 55 2	4·164893	14618	2·769	,,
152	Sandráni ,,	69 7 42	4·450980	28247	5·350	,,
	Gurú-ká-Dilo ,,	81 57 16	4·476160	29934	5·669	,,
	Sandráni s.	84 41 57	4·284414	19249	3·646	,,
153	Gurú-ká-Dilo ,,	46 10 24	4·144474	13947	2·641	,,
	Dharmsing-ká-Kilá s.	49 7 39	4·164893	14618	2·769	,,
	Dharmsing-ká-Kilá s.	41 27 58	4·110804	12906	2·444	Inch 12
154	Gurú-ká-Dilo s.	57 33 49	4·216166	16450	3·116	,,
	Dúdhí ,,	80 58 13	4·284414	19249	3·646	,,
	Gurú-ká-Dilo s.	53 19 57	4·210803	16248	3·077	,,
155	Dúdhí ,,	87 5 18	4·306005	20230	3·832	,,
	Mughul-Sarái ,,	39 34 45	4·110804	12906	2·444	,,
	Mughul-Sarái s.	86 8 37	4·247139	17666	3·346	,,
156	Dúdhí ,,	27 16 15	3·909176	8113	1·537	,,
	Máleh-kí-Búngá ,,	66 35 8	4·210803	16248	3·077	,,
	Dúdhí s.	38 5 49	4·038627	10930	2·070	,,
157	Máleh-kí-Búngá ,,	56 10 19	4·167796	14716	2·787	,,
	Kokro-kí-Jogí ,,	85 43 52	4·247139	17666	3·346	,,
	Máleh-kí-Búngá s.	73 29 24	4·302129	20051	3·797	,,
158	Kokro-kí-Jogí ,,	74 59 59	4·305358	20200	3·826	,,
	Aulkhán-kí-Búngá s.	31 30 37	4·038627	10930	2·070	,,
	Kokro-kí-Jogí s.	58 22 3	4·294540	19703	3·732	,,
159	Aulkhán-kí-Búngá s.	61 35 7	4·308641	20354	3·855	,,
	Bhorá s.	60 2 50	4·302129	20051	3·797	,,
	Aulkhán-kí-Búngá s.	74 16 18	4·300080	19956	3·780	,,
160	Bhorá s.	33 51 27	4·062609	11551	2·188	,,
	Lambeh ,,	71 52 15	4·294540	19703	3·732	,,
	Bhorá s.	47 48 4	4·189295	15463	2·929	,,
161	Lambeh ,,	59 14 31	4·253746	17937	3·397	,,
	Mathuá ,,	72 57 25	4·300080	19956	3·780	,,
	Lambeh s.	31 40 45	3·973756	9414	1·783	,,
162	Mathuá ,,	88 42 21	4·253352	17921	3·394	,,
	Gágeh ,,	59 36 54	4·189295	15463	2·929	,,
	Mathuá s.	93 24 20	4·252470	17884	3·387	,,
163	Gágeh ,,	54 53 49	4·166054	14657	2·776	,,
	Khái ,,	31 41 51	3·973756	9414	1·783	,,
	Gágeh s.	86 47 39	4·329631	21361	4·046	,,
164	Khái ,,	36 29 43	4·104650	12725	2·410	,,
	Nauthiá ,,	56 42 38	4·252470	17884	3·387	,,
	Khái s.	46 32 4	4·321717	20976	3·973	,,
165	Nauthiá ,,	85 48 28	4·459744	28823	5·459	,,
	Mangá No. 1 ,,	47 39 28	4·329631	21361	4·046	,,

NOTE.—XXXVI appertains to the N. W. Himalaya Series. * Deduced Base. † The continuation of this series will be found in the Synopsis of Results of the Gurhágarh Meridional Series under the heading of "Bárí Doáb Secondary Series".

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Nauthiá s.	25 36 1	3·968562	9302	1·762	12
166	Mangá No. 1 „	77 23 49	4·322396	21009	3·979	„
	Mangá No. 2 „	77 0 10	4·321717	20976	3·973	„
	Mangá No. 2 s.	100 5 24	4·246306	17632	3·339	„
167	Mangá No. 1 „	48 37 9	4·128329	13438	2·545	„
	Bhát „	31 17 27	3·968562	9302	1·762	„
	Mangá No. 1 s.	69 49 22	4·264581	18390	3·483	„
168	Bhát „	46 1 32	4·149208	14100	2·670	„
	Nánádogá „	64 9 6	4·246306	17632	3·339	„
	Nánádogá s.	61 55 42	4·309606	20399	3·863	„
169	Bhát „	65 22 21	4·322542	21016	3·980	„
	Khúdpúr „	52 41 57	4·264581	18390	3·483	„
	Bhát s.	39 58 30	4·120865	13209	2·502	„
170	Khúdpúr „	42 50 50	4·145561	13982	2·648	„
	Sundar „	97 10 40	4·309606	20399	3·863	„
	Sundar s.	48 38 23	4·156653	14343	2·717	„
171	Khúdpúr „	87 38 7	4·280892	19094	3·616	„
	Molánwál „	43 43 30	4·120865	13209	2·502	„
	Khúdpúr s.	42 30 38	4·189038	15454	2·927	„
172	Molánwál „	98 38 52	4·354302	22610	4·282	„
	Phení „	38 50 30	4·156653	14343	2·717	„
	Molánwál s.	66 26 56	4·233406	17116	3·242	„
173	Phení „	57 41 25	4·198122	15781	2·989	„
	Chúngí „	55 51 39	4·189038	15454	2·927	„
	Phení s.	40 29 30	4·085940	12188	2·308	„
174	Chúngí „	73 44 32	4·255747	18020	3·413	„
	Bholágarhí „	65 45 58	4·233406	17116	3·242	„
	Chúngí s.	46 22 53	3·994365	9871	1·870	„
175	Bholágarhí „	70 15 10	4·108336	12833	2·431	„
	Sháhpúr „	63 21 57	4·085940	12188	2·308	„
	Bholágarhí s.	57 2 7	4·053659	11315	2·143	„
176	Sháhpúr „	75 54 58	4·116639	13081	2·477	„
	Goperá „	47 2 55	3·994365	9871	1·870	„
	Sháhpúr s.	58 11 34	4·053583	11313	2·143	„
177	Goperá „	63 35 54	4·076415	11924	2·258	„
	Bahádar Kálí „	58 12 32	4·053659	11315	2·143	„
	Goperá s.	63 59 24	4·013761	10322	1·955	12
178	Bahádar Kálí „	35 56 21	3·828721	6741	1·277	„
	Shádíwál „	80 4 15	4·053583	11313	2·143	„
	Bahádar Kálí s.	89 16 35	4·254375	17963	3·402	„
179	Shádíwál „	55 39 12	4·171200	14832	2·809	„
	Hanjarwál „	35 4 13	4·013761	10322	1·955	„
	Shádíwál s.	30 12 3	4·013080	10306	1·952	„
180	Hanjarwál „	88 32 34	4·311344	20481	3·879	„
	Dholánwál „	61 15 23	4·254375	17963	3·402	„
	Hanjarwál s.	74 21 50	4·200340	15861	3·004	„
181	Dholánwál „	66 54 10	4·180429	15151	2·869	„
	Ichrá „	38 44 0	4·013080	10306	1·952	„
	Dholánwál s.	62 4 49	4·189990	15488	2·933	„
182	Ichrá „	53 6 29	4·146697	14018	2·655	„
	Majáng „	64 48 42	4·200340	15861	3·004	„
	Ichrá s.	43 41 47	4·076221	11918	2·257	„
183	Majáng „	72 26 33	4·216127	16449	3·115	„
	Miánmir „	63 51 40	4·189990	15488	2·933	„
	XXIII s.	53 44 27	4·279913	19051	3·608	„
184	Alpá „	55 38 41	4·290135	19505	3·694	„
	Salábat „ (D)	70 36 52	4·348042	22287	4·221	„
	Khánpúr s.	36 13 0	4·279913	19051	3·608	„
185	Alpá „	85 53 9	4·507322	32160	6·091	„
	Salábat „ (D)	57 53 51	4·436376	27313	5·173	„
	Mughul-Sarái s.	59 27 31	3·858742	7223	1·368	„
186	Máleh-kí-Búngá „	15 51 11	3·360041	2291	0·434	„
	Mughul-Sarái Dák Bungalow		3·909176	8113	1·537	
	Mughul-Sarái s.	126 35 50	3·950259	8918	1·689	„
187	Máleh-kí-Búngá „	6 29 4	3·098449	1254	0·238	„
	Mughul-Sarái Tomb		3·909176	8113	1·537	
	Aulkhán-kí-Búngá s.	30 10 46	3·911126	8149	1·543	„
188	Lambeh s.	104 22 47	4·195985	15703	2·974	„
	Miá Temple (D)		4·062609	11551	2·188	
	Lambeh s.	92 49 42	4·302098	20049	3·797	„
189	Gágeh „	23 57 8	3·911126	8149	1·543	„
	Miá Temple (D)		4·253352	17921	3·394	

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles	
			° ′ ″				Inch
	Nauthiá	s.	129 39 53	4·331064	21432	4·059	12
190	Mangá No. 2	,,	1 20 48	3·815788	6543	1·239	,,
	Nauthiá Tower	(D)		4·322396	21009	3·979	
	Mangá No. 1	s.	76 40 11	4·331064	21432	4·059	,,
191	Mangá No. 2	,,	78 20 58	4·333885	21572	4·086	,,
	Nauthiá Tower	(D)		3·968562	9302	1·762	
	Mangá No. 2	s.	26 5 26	4·139681	13794	2·612	,,
192	Bhát	,,	128 32 26	4·389734	24532	4·646	,,
	Chanání Temple	(D)		4·128329	13438	2·545	
	Bhát	s.	54 7 24	4·101662	12638	2·393	,,
193	Sundar	,,	62 10 45	4·139681	13794	2·612	,,
	Chanání Temple	(D)		4·145561	13982	2·648	
	Bhát	s.	112 41 59	4·399114	25068	4·748	,,
194	Sundar	,,	36 19 57	4·206795	16099	3·049	,,
	Mangá Dome			4·145561	13982	2·648	
	Sundar	s.	42 12 19	4·113522	12987	2·460	,,
195	Molánwál	,,	38 46 50	4·083099	12109	2·293	,,
	Jogí-ká-Asan Dome			4·280892	19094	3·616	
	Sháhpúr	s.	70 46 36	4·051858	11268	2·134	,,
196	Bahádar Kálí	,,	21 33 11	3·641869	4384	0·830	,,
	Sháhpúr Dome	(D)		4·076415	11924	2·258	
	Goperá	s.	49 58 58	4·051858	11268	2·134	,,
197	Bahádar Kálí	,,	79 45 43	4·160742	14479	2·742	,,
	Sháhpúr Dome	(D)		4·053583	11313	2·143	
	Sháhpúr	s.	24 28 29	3·740199	5498	1·041	,,
198	Bahádar Kálí	,,	91 33 45	4·122731	13266	2·512	,,
	Chaukí Chimney			4·076415	11924	2·258	
	Bahádar Kálí	s.	31 29 13	4·125213	13342	2·527	,,
199	Hanjarwál	,,	4 0 32	4·251837	17858	3·382	,,
	Bahádar Kálí Temple	(E)		4·171200	14832	2·809	
	Hanjarwál	s.	158 0 51	4·446729	27972	5·298	,,
200	Ichrá	,,	10 17 11	4·125213	13342	2·527	,,
	Bahádar Kálí Temple	(E)		4·180429	15151	2·869	

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles	
	CHINAB						
	SECONDARY SERIES.						
			° ′ ″				Inch
	XXXII		43 12 0	4·898316	79125	14·986	12
201	XXXIV		38 40 27	4·858717	72230	13·680	,,
	Kalowál	s.	98 7 33	5·058530	114427	21·672	,,
	XXXII		56 34 40	4·922761	83707	15·854	,,
202	Kalowál	s.	77 21 5	4·990595	97858	18·534	,,
	Surab	h.s.		4·858717	72230	13·680	
	XXXII		99 44 41	5·083756	121271	22·968	,,
203	Surab	h.s.		4·755523	56954	10·787	
	Hamíntappá	s.	52 40 59	4·990595	97858	18·534	,,
	Surab	h.s.		4·758676	57369	10·865	
204	Hamíntappá	s.	70 15 22	5·061881	115314	21·840	,,
	Khiwá	,,	81 49 22	5·083756	121271	22·968	,,
	Hamíntappá	s.	29 47 48	4·527721	33707	6·384	,,
205	Khiwá	,,	92 27 1	4·831034	67769	12·835	,,
	Bhawání	,,	57 45 11	4·758676	57369	10·865	,,
	Khiwá	s.	51 4 16	4·481719	30319	5·742	,,
206	Bhawání	,,	69 3 48	4·561116	36401	6·894	,,
	Baggá No. 2	,,	59 51 56	4·527721	33707	6·384	,,
	Bhawání	s.	78 30 56	4·612072	40933	7·752	,,
207	Baggá No. 2	,,	54 56 33	4·533914	34191	6·491	,,
	Mandowálí	,,	46 32 31	4·481719	30319	5·742	,,
	Baggá No. 2	s.	56 11 2	4·549285	35423	6·709	,,
208	Mandowálí	,,	50 3 51	4·514435	32692	6·192	,,
	Murulwálá	,,	73 45 7	4·612072	40933	7·752	,,
	Mandowálí	s.	52 46 58	4·450436	28212	5·343	,,
209	Murulwálá	,,	38 4 34	4·339413	21848	4·138	,,
	Niká	,,	89 8 28	4·549285	35423	6·709	,,
	Murulwálá	s.	96 42 6	4·744401	55514	10·514	,,
210	Niká	,,	52 59 6	4·649641	44631	8·453	,,
	Sháhjíoná	,,	30 18 48	4·450436	28212	5·343	,,

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Sháhjíoná s.	46 40 48	4·637016	43353	8·211	12
211	Niká ,,	64 37 54	4·731126	53843	10·197	,,
	Ballo ,,	68 41 18	4·744401	55514	10·514	,,
	Niká s.	34 20 59	4·535292	34300	6·496	,,
212	Ballo ,,	100 9 26	4·776966	59836	11·333	,,
	Mochíwálá ,,	45 29 35	4·637016	43353	8·211	,,
	Ballo s.	71 23 56	4·617627	41460	7·852	,,
213	Mochíwálá ,,	56 57 53	4·564345	36673	6·946	,,
	Jhang ,,	51 38 11	4·535292	34300	6·496	,,
	Mochíwálá s.	65 21 42	4·721740	52691	9·979	,,
214	Jhang ,,	68 58 42	4·733285	54111	10·248	,,
	Nánaksar ,,	45 39 36	4·617627	41460	7·852	,,
	Jhang s.	45 15 34	4·573235	37431	7·089	,,
215	Nánaksar ,,	43 50 40	4·562340	36504	6·914	,,
	Vigráná-Siál ,,	90 53 46	4·721740	52691	9·979	,,
	Nánaksar s.	49 38 24	4·481408	30298	5·738	,,
216	Vigráná-Siál ,,	60 4 15	4·537298	34459	6·526	,,
	Madhukáwá ,,	70 17 21	4·573235	37431	7·089	,,
	Vigráná-Siál s.	51 33 6	4·481271	30288	5·736	,,
217	Madhukáwá ,,	76 52 26	4·575917	37663	7·133	,,
	Tázípindí ,,	51 34 28	4·481408	30298	5·738	,,
	Madhukáwá s.	44 23 43	4·430782	26964	5·107	,,
218	Tázípindí ,,	83 48 18	4·583385	38316	7·257	,,
	Havelí No. 2 ,,	51 47 59	4·481271	30288	5·736	,,
	Tázípindí s.	60 7 46	4·495521	31298	5·928	,,
219	Havelí No. 2 ,,	71 32 3	4·534469	34235	6·484	,,
	Jabúáná ,,	48 20 11	4·430782	26964	5·107	,,
	Havelí No. 2 s.	52 22 21	4·485629	30593	5·794	,,
220	Jabúáná ,,	73 30 28	4·568660	37039	7·015	,,
	Kot-Rustam ,,	54 7 11	4·495521	31298	5·928	,,
	Jabúáná s.	103 38 47	4·727947	53450	10·123	,,
221	Kot-Rustam ,,	42 33 32	4·570553	37201	7·046	,,
	Uch ,,	33 47 41	4·485629	30593	5·794	,,
	Kot-Rustam s.	69 34 56	4·732589	54024	10·232	,,
222	Uch ,,	42 24 50	4·589739	38881	7·364	,,
	Sangvewálá ,,	68 0 14	4·727947	53450	10·123	,,
	Uch s.	28 5 1	4·498741	31531	5·972	12
223	Sangvewálá ,,	98 9 12	4·821530	66302	12·557	,,
	Chúniál Tibbá ,,	53 45 47	4·732589	54024	10·232	,,
	Sangvewálá s.	63 0 52	4·592657	39143	7·413	,,
224	Chúniál Tibbá ,,	71 6 36	4·618676	41560	7·871	,,
	Jaibáhan ,,	45 52 32	4·498741	31531	5·972	,,
	Chúniál Tibbá s.	45 33 51	4·554380	35841	6·788	,,
225	Jaibáhan ,,	83 11 29	4·697587	49841	9·440	,,
	Kapúrwálá h.s.	51 14 40	4·592657	39143	7·413	,,
	Jaibáhan s.	47 57 20	4·466608	29282	5·546	,,
226	Kapúrwálá h.s.	66 41 0	4·558838	36211	6·858	,,
	Bhau-Sultán s.	65 21 40	4·554380	35841	6·788	,,
	Kapúrwálá h.s.	41 13 3	4·466257	29259	5·541	,,
227	Bhau-Sultán s.	97 31 28	4·643669	44022	8·337	,,
	Shatánwálá ,,	41 15 29	4·466608	29282	5·546	,,
	Bhau-Sultán s.	50 4 13	4·385212	24278	4·598	,,
228	Shatánwálá ,,	62 23 17	4·447998	28054	5·313	,,
	Jalálá-Dab ,,		4·466257	29259	5·541	
	Shatánwálá s.	95 50 30	4·517973	32959	6·242	,,
229	Jalálá-Dab ,,	37 2 16	4·300077	19956	3·780	,,
	Ahmadpúr ,,	47 7 14	4·385212	24278	4·598	,,
	Ahmadpúr s.	60 47 1	4·482488	30373	5·752	,,
230	Jalálá-Dab ,,	47 56 17	4·412232	25836	4·893	,,
	Fathi-Mirálí ,,	71 16 42	4·517973	32959	6·242	,,
	Jalálá-Dab s.	35 27 30	4·246320	17633	3·340	,,
231	Fathi-Mirálí ,,	56 44 43	4·405141	25418	4·814	,,
	Panjírí-ká-khú ,,	87 47 47	4·482488	30373	5·752	,,
	Fathi-Mirálí s.	74 12 0	4·344332	22097	4·185	,,
232	Panjírí-ká-khú ,,	55 38 28	4·277785	18958	3·590	,,
	Pípal-Mirálí ,,	50 9 32	4·246320	17633	3·340	,,
	Panjírí-ká-khú s.	64 10 44	4·381708	24083	4·561	,,
233	Pípal-Mirálí ,,	60 8 18	4·365524	23202	4·394	,,
	Báwar ,,	55 40 58	4·344332	22097	4·185	,,
	Pípal-Mirálí s.	83 38 20	4·565009	36729	6·956	,,
234	Báwar ,,	55 41 41	4·484696	30528	5·782	,,
	Jalborwálá ,,	40 39 59	4·381708	24083	4·561	,,

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
235	Báwar s.	45 50 13	4·436490	27321	5·174	12
	Jalborwálá ,,	59 29 51	4·516062	32814	6·215	,,
	No. 28 ,,	74 39 56	4·565009	36729	6·956	,,
236	Jalborwálá s.	30 21 28	4·155163	14294	2·707	,,
	No. 28 ,,	74 38 2	4·435720	27272	5·165	,,
	Báreh-ká-khú ,,	75 0 30	4·436490	27321	5·174	,,
237	Ballo s.	69 8 44	4·678238	47669	9·028	,,
	Mochíwálá ,,	68 36 7	4·676646	47495	8·995	,,
	Maghiáná ,, (D)	42 15 9	4·535292	34300	6·496	,,
238	Mochíwálá s.	53 43 28	4·666018	46347	8·778	,,
	Nánaksar ,,	56 0 55	4·678238	47669	9·028	,,
	Maghiáná ,, (D)	70 15 37	4·733285	54111	10·248	,,
239	Mochíwálá s.	48 29 38	4·617303	41429	7·846	,,
	Nánaksar ,,	53 30 38	4·648126	44476	8·423	,,
	Maghiáná Magazine (D)		4·733285	54111	10·248	
240	Nánaksar s.	35 59 38	4·391993	24660	4·670	,,
	Vigráná-Siál ,,	80 52 19	4·617303	41429	7·846	,,
	Maghiáná Magazine (D)		4·573235	37431	7·089	
241	Nánaksar s.	42 11 32	4·440196	27555	5·219	,,
	Madhukáwá ,,	80 40 43	4·607300	40486	7·668	,,
	Isá-Fakír-dá-pindí s. (D)	57 7 45	4·537298	34459	6·526	,,
242	Madhukáwá s.	66 29 4	4·502298	31791	6·021	,,
	Tázípindí ,,	52 38 3	4·440196	27555	5·219	,,
	Isá-Fakír-dá-pindí s. (D)	60 52 53	4·481271	30288	5·736	,,

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
243	Nánaksar s.	36 41 49	4·404985	25409	4·812	12
	Vigráná-Siál ,,	81 37 13	4·623926	42065	7·967	,,
	Maghiáná Church (D)		4·573235	37431	7·089	
244	Nánaksar s.	44 8 41	4·492136	31055	5·882	,,
	Isá-Fakír-dá-pindí s.	70 37 48	4·623926	42065	7·967	,,
	Maghiáná Church (D)		4·607300	40486	7·668	
245	Sangvewálá s.	55 20 44	4·732260	53983	10·224	,,
	Jaibáhan ,,	85 21 40	4·815648	65411	12·388	,,
	Shorkot ,, (D)	39 17 36	4·618676	41560	7·871	,,
246	Jaibáhan s.	97 36 59	4·838054	68874	13·044	,,
	Bhau-Sultán ,,	50 58 35	4·732260	53983	10·224	,,
	Shorkot ,, (D)	31 24 26	4·558838	36211	6·858	,,
247	Kot-Rustam s.	97 55 19	4·681229	47999	9·091	,,
	Sangvewálá ,,	28 43 34	4·367198	23292	4·411	,,
	Kakúwálá ,, (D)	53 21 7	4·589739	38881	7·364	,,
248	Sangvewálá s.	46 45 24	4·679017	47755	9·044	,,
	Shorkot ,,	47 4 7	4·681229	47999	9·091	,,
	Kakúwálá ,, (D)	86 10 29	4·815648	65411	12·388	,,
249	Kapúrwálá h.s.	39 45 9	4·486256	30638	5·803	,,
	Shatánwálá s.	73 29 31	4·662153	45936	8·700	,,
	Masúdáná h.s. (D)	66 45 20	4·643669	44022	8·337	,,
250	Shatánwálá s.	87 1 13	4·552474	35684	6·758	,,
	Ahmadpúr ,,	59 1 42	4·486256	30638	5·803	,,
	Masúdáná h.s. (D)	33 57 5	4·300077	19956	3·780	,,

July 1874.

J. B .N. HENNESSEY.

JOGI-TILA MERIDIONAL SERIES.

SECONDARY TRIANGULATION.

AZIMUTHS OF SURROUNDING POINTS AT PRINCIPAL, PRINCIPAL-AUXILIARY AND SECONDARY STATIONS.

The following table contains, in the first column, the name of each Principal, Principal-Auxiliary or Secondary Station at which azimuths to Secondary Points have been observed immediately followed by those azimuths. The second column contains the number of the triangle giving the distance between the Station and the Point.

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
AHMADPUR S.			
Masúdáná	h.s.	142 53 15	250
Shatánwálá	s.	201 54 57	229
Jalálá-Dab	„	249 2 11	229
Fathi-Mirálí	„	309 49 12	230
AKBAR-DA-BUNGA, VII			
Pír Khális Khángáh		242 20 30	66
ALPA S.			
Mega, XXIII		25 32 15	150
Salábat	s.	81 10 56	184
Khánpúr	„	167 4 5	150
Sandráni	„	201 31 54	151
Gurú-ká-Dilo	„	230 26 56	152
ASRUR, XXXIII			
Dográ-kí-Khángáh, W. Dome		157 1 29	106
Dográ-kí-Khángúh, E. Dome		157 19 53	108
Sajádá Tomb		192 35 14	117
ASRUR, XXXIII			
Asrúr Mosque		233 47 22	104
AULKHAN-KI-BUNGA S.			
Máleh-kí-Búngá	s.	71 33 13	158
Kokro-kí-Jogí	„	103 3 50	158
Bhorá	„	164 38 57	159
Lambeh	„	238 55 15	160
Miá Temple		269 6 1	188
BAGGA S.			
Nankháná Samád		21 19 55	102
Nára, XXVIII		47 48 30	101
Shá-Kot, XXX		97 18 10	101
BAGGA No. 2 S.			
Murulwálá	s.	53 48 18	208
Khiwá	„	242 48 47	206
Bhawání	„	302 40 43	206
Mandowálí	„	357 37 16	207
BAHADAR KALI S.			
Sháhpúr Dome		37 36 58	197
Sháhpúr	s.	59 10 9	177
Goperá	„	117 22 41	177
Shádíwál	„	153 19 2	178
Hanjarwál	„	242 35 37	179
Bahádar Kálí Temple		274 4 50	199
Chaukí Chimney		327 36 24	198
BALA, XL			
Jalálpúr House		39 41 54	115
BALLO S.			
Maghiáná	s.	37 13 58	237
Jhang	„	39 29 10	213
Sháhjíoná	„	159 14 30	211
Niká	„	227 55 48	211
Mochíwálá	„	328 5 14	212

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Bareh-ka-khú s.			
Jalborwálá	s.	116 35 57	236
No. 28	„	191 36 27	236
Bawar s.			
Jalborwálá	s.	26 43 53	234
Pípal-Mirálí	„	82 25 34	233
Panjírí-ká-khú	„	138 6 32	233
No. 28	„	340 53 40	235
Bhat s.			
Mangá No. 2	s.	48 19 45	167
Mangá No. 1	„	79 37 12	167
Nánádogá	„	125 38 44	168
Chanání Temple		176 52 11	192
Khúdpúr	„	191 1 5	169
Sundar	„	230 59 35	170
Mangá Dome		343 41 34	194
Bhau-Sultan s.			
Shatánwálá	s.	43 43 52	227
Kapúrwálá	h.s.	141 15 20	226
Jaibáhan	s.	206 37 0	226
Shorkot	„	257 35 35	246
Jalálá-Dab	„	353 39 39	228
Bhawani s.			
Mandowálí	s.	44 12 21	207
Baggú No. 2	„	122 43 17	206
Khiwá	„	191 47 5	205
Hamíntappá	„	249 32 16	205
Bholagarhi s.			
Phení	s.	61 2 45	174
Goperá	„	227 59 30	176
Sháhpúr	„	285 1 37	175
Chúngí	„	355 16 47	174
Bhora s.			
Kokro-kí-Jogí	s.	44 41 16	159
Mathuá	„	262 58 55	161
Lambeh	„	310 46 59	160
Aulkhán-kí-Búngá	„	344 38 26	159
Burala, XXII			
Jámbrá Flag		305 25 40	99
Chail, XLVII			
Kusak Tomb		12 9 18	142
Dilúr House		47 0 1	146
Karangal Hill Cairn		61 9 1	144
Salt Range No. 3, Tomb		66 31 7	137
Jogí-Tilá Hill Tomb		256 35 48	148
Malakwál Tomb		335 28 59	128
Chiniout, XXXII			
Hamíntappá	s.	42 26 43	203
Kiráná Tomb Dome		136 9 25	113
Surab	h.s.	142 11 24	202
Kalowál	s.	198 46 4	201
Chungi s.			
Molánwál	s.	45 40 42	173
Phení	„	101 32 21	173

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Chungi s.			
Bholágarhí	s.	175 16 53	174
Sháhpúr	„	221 39 46	175
Chunial Tibba s.			
Kapúrwálá	h.s.	23 19 48	225
Uch	s.	212 53 34	223
Sangvewálá	„	266 39 21	223
Jaibáhan	„	337 45 57	224
Churawala, III			
Bháwalgarh Fort		218 21 11	64
Dharmsing-ka-Kila s.			
Sandráni	s.	47 44 22	153
Dúdhí	„	317 8 45	154
Gurú-ká-Dilo	„	358 36 43	153
Dholanwal s.			
Hanjarwál	s.	6 13 50	180
Shádíwál	„	67 29 13	180
Majáng	„	237 14 51	182
Ichrá	„	299 19 40	181
Dipalpur s.			
Kadiánwála, XV		77 57 37	88
Phosi, XVI		113 25 36	88
Pindi, XVIII		157 37 7	89
Hujrá	s.	242 54 28	90
Dogra, XI			
Nautheh Flag		120 29 0	83
Dharrí Flag		218 49 45	78
Sháh Ikká	s.	225 1 11	81
Kachá Paká Flag		227 40 39	85
Pír Gadá Red Tomb		246 38 4	84
Sukhpúr Flag		249 1 14	80
Bungá Flag		280 44 45	75
Dudhi s.			
Gurú-ká-Dilo	s.	56 11 39	154
Dharmsing-ká-Kilá	„	137 9 52	154
Kokro-kí-Jogi	„	263 44 17	157
Máleh-kí-Búngá	„	301 50 6	156
Mughul Sarái	„	329 6 21	155
Faridpur, XIII			
Shámgarh Flag		66 28 53	72
Bungá Flag		73 55 33	75
Daular Fort		92 35 16	76
Dharrí Flag		97 47 39	78
Sháh Ikká	s.	123 1 8	81
Sukhpúr Flag		130 28 55	80
Kachá Paká Flag		143 52 14	85
Lálúpúr Flag		159 39 45	87
Pír Gadá Red Tomb		181 42 28	84
Bungá (heliotrope)		254 38 3	74
Haveli	„	313 53 34	73
Fathi-Mirali s.			
Ahmadpúr	s.	129 51 8	230
Jalálá-Dab	„	201 7 50	230
Panjírí-ká-khú	„	257 52 33	231
Pípal-Mirálí	„	332 4 33	232

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Fatti, XXXV			
Dográ-kí-Khángáh, E. Dome		285 45 38	107
Dográ-kí-Khángáh, W. Dome		285 47 25	105
Asrúr Mosque		301 9 2	103
Firoz, XXI			
Jámbrá Flag		86 11 25	99
Saiyidwálá	s.	225 8 39	95
Májrá Tomb Spire		278 6 21	97
Sátgarra Town Flag		329 31 51	94
Gageh s.			
Miá Temple		17 47 48	189
Lambeh	s.	41 44 56	162
Mathuá	„	101 21 50	162
Khái	„	156 15 39	163
Nauthiá	„	243 3 18	164
Gopera s.			
Sháhpúr	s.	0 57 34	176
Bholágarhí	„	48 0 29	176
Shádíwál	„	233 22 16	178
Bahádar Kálí	„	297 21 40	177
Sháhpúr Dome		347 20 38	197
Gunia, XLII			
Kiráná Tomb Dome		49 24 34	114
Salt Range No. 1, Dome		128 51 19	132
Salt Range No. 2, Tomb		133 9 23	134
Salt Range No. 3, Tomb		138 7 1	136
Salt Range No. 4, Cairn		140 25 9	139
Salt Range No. 5, Cairn		148 38 56	140
Dabhar Tower		197 27 7	119
Rerká Tower		307 10 0	118
Guru-ka-Dilo s.			
Alpá	s.	50 29 6	152
Sandráni	„	132 26 22	152
Dharmsing-ká-Kilá	„	178 36 46	153
Dúdhí	„	236 10 35	154
Mughul Sarái	„	289 30 32	155
Hamintappa s.			
Bhawání	s.	69 38 41	205
Khiwá	„	99 26 29	204
Surab	h.s.	169 41 51	203
Chiniout, XXXII		222 22 50	203
Hanjarwal s.			
Bahádar Kálí Temple		58 36 24	199
Bahádar Kálí	s.	62 36 56	179
Shádíwál	„	97 41 9	179
Dholánwál	„	186 13 43	180
Ichrá	„	260 35 33	181
Haveli s.			
Pír-Ghani, X		55 57 38	73
Farídpúr, XIII		133 56 12	73
Bungá (heliotrope)		197 5 9	74
Haveli No. 2 s.			
Kot-Rustam	s.	59 14 21	220
Jabúáná	„	111 36 42	219
Tázípindí	„	183 8 45	218
Madhukáwá	„	234 56 44	218

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Hazara, XXXIX			
Salt Range No. 1, Dome		137 27 57	132
Salt Range No. 2, Tomb		140 28 29	134
Salt Range No. 4, Cairn		146 2 32	138
Salt Range No. 5, Cairn		152 27 36	141
Hela t.s.			
Revenue Survey Pillar		114 7 3	124
Ker, XLVIII		120 12 37	121
Koár, XLIX		186 4 29	121
Tomb of Mirzá Sukálí		350 4 15	123
Hujan, XXXIV			
Kiráná Tomb Dome		100 35 2	113
Kalowál	s.	100 48 48	201
Pindí Phatián Kachahrí		141 10 14	111
Pindí Phatián Tomb Spire		141 58 47	109
Hujra s.			
Dipálpúr	s.	62 59 33	90
Pindi, XVIII		102 6 56	90
Shergarh Tomb		142 6 42	91
Ichra s.			
Bahádar Kálí Temple		70 19 53	200
Hanjarwál	s.	80 37 4	181
Dholánwál	,,	119 21 4	181
Majáng	,,	172 27 33	182
Miánmir	,,	216 9 20	183
Isa-Fakir-da-pindi s.			
Tázípindí	s.	46 44 50	242
Maghiáná Church		218 6 24	244
Nánaksar	,,	288 44 12	241
Madhukáwá	,,	345 51 57	241
Jabuana s.			
Kot-Rustam	s.	5 4 17	220
Uch	,,	108 43 4	221
Tázípindí	,,	243 13 38	219
Haveli No. 2	,,	291 33 49	219
Jaibahan s.			
Bhau-Sultán	s.	26 38 35	226
Kapúrwálá	h.s.	74 35 55	225
Chúniál Tibbá	s.	157 47 24	224
Sangvewálá	,,	203 39 56	224
Shorkot	,,	289 1 36	245
Jalala-Dab s.			
Fathi-Mirálí	s.	21 8 54	230
Ahmadpúr	,,	69 5 11	229
Shatánwálá	,,	106 7 27	228
Bhau-Sultán	,,	173 39 57	228
Panjírí-ká-khú	,,	345 41 24	231
Jalborwala s.			
Pipal-Mirálí	s.	166 2 18	234
Báwar	,,	206 42 17	234
No. 28	,,	266 12 8	235
Báreh-ká-khú	,,	296 33 36	236
Jeto, XLI			
Rerká Tower		89 9 35	118
Salt Range No. 4, Cairn		132 8 30	138

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Jeto, XLI			
Salt range No. 5, Cairn		136 54 4	140
Jhang s.			
Vigráná-Siál	s.	25 19 18	215
Ballo	,,	219 26 51	213
Mochíwálá	,,	271 5 2	213
Nánaksar	,,	340 3 44	214
Jhulan, IV			
Mosque No. 1		272 32 26	62
Jogi-Tila, XXXVI of N. W. H. Series			
Malakwál Tomb		32 51 37	127
Kusak Tomb		64 38 20	143
Dilúr House		70 56 33	146
Karangal Hill Cairn		74 40 18	145
Jogí-Tilá Hill Tomb		119 31 59	147
Kadar, XLV			
Chambal Hill Cairn		168 35 27	130
Jandorá Shiválá		189 9 57	125
Ratowál	s.	196 35 9	120
Tomb of Mirzá Sukálí		249 0 47	122
Kadianwala, XV			
Daular Fort		4 8 7	77
Dharrí Flag		15 54 16	79
Dipálpúr	s.	257 52 18	88
Lálúpúr Flag		278 18 51	87
Kachá Paká Flag		299 14 33	86
Sháh Ikká	,,	339 16 45	82
Kajkot, XIV			
Nautheh Flag		322 36 37	83
Kakuwala s.			
Shorkot	s.	15 29 36	248
Sangvewálá	,,	101 40 5	247
Kot-Rustam	,,	155 1 12	247
Kalowal s.			
Chiniout, XXXII		18 48 26	201
Surab	h.s.	96 9 31	202
Húján, XXXIV		280 40 53	201
Kapurwala h.s.			
Shatánwálá	s.	2 26 35	227
Masúdáná	h.s.	42 11 44	249
Chúniál Tibbá	s.	203 17 52	225
Jaibáhan	,,	254 32 32	225
Bhau-Sultán	,,	321 13 32	226
Ker, XLVIII			
Jandorá Shiválá		85 53 50	125
Helá	t.s.	300 11 7	121
Tomb of Mirzá Sukálí		313 12 54	122
Revenue Survey Pillar		324 21 10	124
Khai s.			
Mathuá	s.	7 56 47	163
Mangá No. 1	,,	253 13 9	165
Nauthiá	,,	299 45 13	164
Gágeh	,,	336 14 56	163

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Khanpur s.			
Mega, XXIII		4 16 3	149
Salábat	s.	23 16 29	185
Roshisháni, XXV		97 12 44	149
Sandráni	,,	265 53 43	151
Alpá	,,	347 3 29	150
Khiwa s.			
Bhawání	s.	11 47 47	205
Baggá No. 2	,,	62 52 3	206
Surab	h.s.	197 31 24	204
Hamintappá	s.	279 20 46	204
Khudpur s.			
Bhát	s.	11 1 28	169
Nánádogá	,,	63 43 25	169
Phení	,,	198 1 53	172
Molánwál	,,	240 32 31	171
Sundar	,,	328 10 38	170
Koar, XLIX			
Helá	t.s.	6 5 42	121
Chiliánwálá Monument		30 36 4	129
Chambal Hill Cairn		70 44 22	131
Kokro-ki-Jogi s.			
Dúdhí	s.	83 45 45	157
Bhorá	,,	224 39 51	159
Aulkhán-kí-Búngá	,,	283 1 54	158
Máleh-kí-Búngá	,,	358 1 53	157
Kot-Baksha, VI			
Kalíáná Flag		154 16 12	68
Paká Sidhárá Flag		180 37 48	69
Bháwalgarh Fort		273 22 40	64
Mosque No. 1		331 6 14	63
Kothiala, XLVI			
Chambal Hill Cairn		163 6 24	130
Jogí-Tilá Hill Tomb		175 28 58	147
Chiliánwálá Monument		239 25 13	129
Jandorá Shiválá		334 49 2	126
Kot-Rustam s.			
Sangvewálá	s.	72 55 33	222
Uch	,,	142 30 29	221
Jabúáná	,,	185 4 1	220
Haveli No. 2	,,	239 11 12	220
Kakúwálá	,,	335 0 14	247
Lambeh s.			
Aulkhán-kí-Búngá	s.	58 56 14	160
Bhorá	,,	130 48 29	160
Mathuá	,,	190 3 0	161
Gágeh	,,	221 43 45	162
Miá Temple		314 33 27	188
Madhukawa s.			
Haveli No. 2	s.	54 59 50	218
Tázípindí	,,	99 23 33	217
Isá-Fakír-dá-pindí	,,	165 52 37	241
Vigráná-Siál	,,	176 15 59	216
Nánaksar	,,	246 33 20	216

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Maghiana s.			
Ballo	s.	217 11 6	237
Mochíwálá	„	259 26 15	237
Nánaksar	„	329 41 52	238
Majang s.			
Dholánwál	s.	57 16 2	182
Ichrá	„	352 27 20	182
Maleh-ki-Bunga s.			
Mughul-Sarái Dák Bungalow		39 25 17	186
Mughul-Sarái Tomb		48 47 24	187
Mughul-Sarái	s.	55 16 28	156
Dúdhí	„	121 51 36	156
Kokro-kí-Jogí	„	178 1 55	157
Aulkhán-kí-Búngá	„	251 31 19	158
Malka, XII			
Malká Village Flag		4 11 51	70
Mamudeh, I			
Mosque No. 1		197 31 55	62
Mandowali s.			
Niká	s.	74 46 37	209
Murulwálá	„	127 33 35	208
Baggá No. 2	„	177 37 26	207
Bhawání	„	224 9 57	207
Manga No. 1 s.			
Nauthiá Tower		24 52 48	191
Nauthiá	s.	25 36 26	165
Khái	„	73 15 54	165
Nánádogá	„	189 46 6	168
Bhát	„	259 35 28	167
Mangá No. 2	„	308 12 37	166
Manga No. 2 s.			
Nauthiá Tower		49 52 23	190
Nauthiá	s.	51 13 11	166
Mangá No. 1	„	128 13 21	166
Chanání Temple		202 13 19	192
Bhát	„	228 18 45	167
Masudana h.s.			
Kapúrwálá	h.s.	222 8 43	249
Shatánwálá	s.	288 54 3	249
Ahmadpúr	„	322 51 8	250
Mathua s.			
Lambeh	s.	10 3 16	161
Bhorá	„	83 0 41	161
Khái	„	187 56 35	163
Gágeh	„	281 20 55	162
Mega, XXIII			
Salábat	s.	151 46 51	184
Khánpúr	„	184 15 42	149
Alpá	„	205 31 18	150
Mianmir s.			
Ichrá	s.	36 10 18	183

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Mochiwala s.			
Nánaksar	s.	25 47 28	214
Maghiáná Magazine		74 17 6	239
Maghiáná	„	79 30 56	237
Jhang	„	91 9 10	213
Ballo	„	148 7 3	212
Niká	„	193 36 38	212
Molanwal s.			
Sundar	s.	16 50 16	171
Khúdpúr	„	60 33 46	171
Phení	„	159 12 38	172
Chúngí	„	225 39 34	173
Jogí-ká-Asan Dome		338 3 26	195
Mughul-Sarai s.			
Mughul-Sarái Tomb		1 51 38	187
Gurú-ká-Dilo	s.	109 32 26	155
Dúdhí	„	149 7 11	155
Máleh-kí-Búngá	„	235 15 48	156
Mughul-Sarái Dák Bungalow		294 43 19	186
Mugo, XXXVI			
Pindí Phatián Tomb Spire		46 16 32	110
Pindí Phatián Kachahrí		46 28 59	112
Jalálpúr House		156 46 24	115
R. S. Platform	s.	236 9 53	116
Murulwala s.			
Sháhjíoná	s.	82 17 26	210
Bhaggá No. 2	„	233 45 39	208
Mandowálí	„	307 30 46	208
Niká	„	345 35 20	209
Nanadoga s.			
Mangá No. 1	s.	9 46 20	168
Khúdpúr	„	243 41 32	169
Bhát	„	305 37 14	168
Nanaksar s.			
Madhukáwá	s.	66 36 28	216
Isá-Fakír-dá-pindí	„	108 48 0	241
Vigráná-Siál	„	116 14 52	215
Maghiáná	„	149 44 13	238
Maghiáná Magazine		152 14 30	239
Maghiáná Church		152 56 41	243
Jhang	„	160 5 32	214
Mochíwálá	„	205 45 8	214
Nar, XLIV			
Dabhar Tower		52 39 31	119
Salt Range No. 1, Dome		112 5 40	133
Salt Range No. 2, Tomb		116 46 46	135
Salt Range No. 3, Tomb		119 59 54	136
Kusak Tomb		145 39 20	142
Karangal Hill Cairn		146 20 56	144
Malakwál Tomb		154 1 32	127
Nara, XXVIII			
Baggá	s.	227 43 30	101
Nankháná Samád		253 27 28	100
Nauthia s.			
Nauthiá Tower		0 51 26	190

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Nauthia s.			
Gágeh	s.	63 4 26	164
Khái	„	119 47 4	164
Mangá No. 1	„	205 35 32	165
Mangá No. 2	„	231 11 33	166
Nika s.			
Mochíwálá	s.	13 38 3	212
Ballo	„	47 59 2	211
Sháhjíoná	„	112 36 56	210
Murulwálá	„	165 36 2	209
Mandowálí	„	254 44 30	209
No. 28 s.			
Báreh-ká-khú	s.	11 36 44	236
Jalborwálá	„	86 14 46	235
Báwar	„	160 54 42	235
Pak-Patan, IX			
Kalíáná Flag		58 50 7	68
Paká Sidhárá Flag		76 25 34	69
Malká Village Flag		128 52 13	70
Shámgarh Flag		203 28 26	71
Pír Khális Khángáh		295 38 12	66
Bháwalgarh Fort		333 51 6	65
Panjiri-ka-khu s.			
Pípal-Mirálí	s.	22 15 46	232
Fathi-Mirálí	„	77 54 14	231
Jalálá-Dab	„	165 42 1	231
Báwar	„	318 5 2	233
Pheni s.			
Khúdpúr	s.	18 2 35	172
Bholágarhí	„	241 1 10	174
Chúngí	„	281 30 40	173
Molánwál	„	339 12 5	172
Phosi, XVI			
Jíwan Sing Flag		273 8 20	93
Tomb in Jungle		290 10 15	92
Dipálpúr	s.	293 18 30	88
Pindi, XVIII			
Shergarh Tomb		247 22 27	91
Hujrá	s.	282 0 11	90
Jíwan Sing Flag		314 54 58	93
Dipálpúr	„	337 35 27	89
Tomb in Jungle		354 6 43	92
Pipal-Mirálí s.			
Fathi-Mirálí	s.	152 5 25	232
Panjirí-ká-khú	„	202 14 57	232
Báwar	„	262 23 15	233
Jalborwálá	„	346 1 35	234
Pir-Ghani, X			
Shámgarh Flag		122 0 48	71
Daular Fort		145 33 34	76
Havelí	s.	235 54 13	73
Pír Khális Khángáh		357 31 2	67

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Ratowal s.			
Kadar, XLV		16 35 27	120
Sadúlapúr, XLIII		337 38 14	120
Roshishani, XXV			
Saiyidwálá	s.	12 40 12	96
Khánpúr	,,	277 8 47	149
R. S. Platform s.			
Múgo, XXXVI		56 10 20	116
Jalálpúr House		142 38 57	116
Ruralla, XXIV			
Saiyidwálá	s.	307 34 30	95
Sadulapur, XLIII			
Ratowál	s.	157 41 23	120
Saiyidwala s.			
Firoz, XXI		45 11 17	95
Rurálla, XXIV		127 39 7	95
Roshisháni, XXV		192 39 19	96
Májrá Tomb Spire		328 58 20	98
Salabat s.			
Khánpúr	s.	203 15 13	185
Alpá	,,	261 9 4	184
Mega, XXIII		331 45 56	184
Sandrani s.			
Alpá	s.	21 33 0	151
Khánpúr	,,	85 55 25	151
Dharmsing-ká-Kilá	,,	227 43 21	153
Gurú-ká-Dilo	,,	312 25 18	152
Sangla, XXXI			
Pindí Phatián Kachahrí		153 34 40	111
Pindí Phatián Tomb Spire		153 44 34	109
Dográ-kí-Khángáh W. Dome		238 16 59	105
Dográ-kí-Khángáh E. Dome		238 19 56	107
Asrúr Mosque		251 51 24	103
Sangvewala s.			
Jaibáhan	s.	23 41 35	224
Chúniál Tibbá	,,	86 42 27	223

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Sangvewala s.			
Uch	,,	184 51 39	222
Kot-Rustam	,,	252 51 53	222
Kakúwálá	,,	281 35 27	247
Shorkot	,,	328 20 51	245
Satgarra, XX			
Májrá Tomb Spire		204 16 58	97
Sátgarra Town Flag		232 8 14	94
Shadiwal s.			
Goperá	s.	53 22 49	178
Dholánwál	,,	247 27 19	180
Hanjarwál	,,	277 39 22	179
Bahádar Kálí	,,	333 18 34	178
Shah Ikka s.			
Dogra, XI		45 3 33	81
Kadiánwála, XV		159 17 27	82
Farídpúr, XIII		302 57 51	81
Shahjamal, XXXVIII			
Sajádá Tomb		306 1 38	117
Shahjiona s.			
Murulwálá	s.	262 12 59	210
Niká	,,	292 31 47	210
Ballo	,,	339 12 35	211
Shahpur s.			
Chúngí	s.	41 40 37	175
Bholágarhí	,,	105 2 34	175
Goperá	,,	180 57 32	176
Bahádar Kálí	,,	239 9 6	177
Chaukí Chimney		263 37 35	198
Sháhpúr Dome		309 55 42	196
Sha-Kot, XXX			
Baggá	s.	277 9 30	101
Nankháná Samád		301 52 1	100
Shatanwala s.			
Ahmadpúr	s.	21 55 40	229
Masúdáná	h.s.	108 56 53	249
Kapúrwálá	,,	182 26 24	227

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Shatanwala s.			
Bhau-Sultán	s.	223 41 53	227
Jalálá-Dab	,,	286 5 10	228
Shorkot s.			
Bhau-Sultán	s.	77 42 10	246
Jaibáhan	,,	109 6 36	245
Sangvewálá	,,	148 24 12	245
Kakúwálá	,,	195 28 19	248
Sundar s.			
Mangá Dome		14 40 43	194
Bhát	s.	51 0 40	170
Chanání Temple		113 11 25	193
Khúdpúr	,,	148 11 20	170
Molánwál	,,	196 49 43	171
Jogí-ká-Asan Dome		239 2 2	195
Surab h.s.			
Khiwá	s.	17 34 53	204
Kalowál	,,	276 1 2	202
Chiniout, XXXII		322 5 17	202
Hamín Tappá	,,	349 39 37	203
Tazipindi s.			
Haveli No. 2	s.	3 8 54	218
Jabúáná	,,	63 16 40	219
Isa-Fakír-dá-pindí	,,	226 42 33	242
Vigráná-Siál	,,	227 46 8	217
Madhukáwá	,,	279 20 36	217
Uch s.			
Sangvewálá	s.	4 52 6	222
Chúniál Tibbá	,,	32 57 7	223
Jabúáná	,,	288 39 35	221
Kot-Rustam	,,	322 27 16	221
Vigrana-Sial s.			
Tázípindí	s.	47 48 53	217
Jhang	,,	205 17 46	215
Maghiáná Church		214 34 19	243
Maghiáná Magazine		215 19 13	240
Nánaksar	,,	296 11 32	215
Madhukáwá	,,	356 15 47	216

September 1874.

J. B. N. HENNESSEY.

JOGI-TILA MERIDIONAL SERIES.

CO-ORDINATES AND DESCRIPTIONS OF ALL STATIONS AND POINTS.

The following table gives the co-ordinates of all the stations and other fixed points, arranged in alphabetical order, also the descriptions of the secondary stations and intersected (or unvisited) points, and references to the preceding pages where the descriptions of the principal stations are given. In certain instances numbers are added which have reference to the given data of the triangles by which the station or point has been fixed; when these numbers are omitted it is to be understood that no triangles are given.

Note.—λ stands for Latitude North; L for Longitude East of Greenwich; H for Height of station in feet above mean sea level, if determined trigonometrically, H_s for the Height when found by spirit leveling and *h* for Height of station tower or pillar. For visited stations and for other points of superior accuracy the values of λ and L are given to two places of decimals; for well determined objects to one place, and for the remaining points to the nearest second. Principal stations are distinguished by the Roman numerals I, II, &c.; secondary stations by the letters h. s. and s.

Name of station, district, description, co-ordinates &c.	Name of station, district, description, co-ordinates &c.	Name of station, district, description, co-ordinates &c.
Ahmadpúr s. (*Jhang*) On top of Thákur Dás druggist's house about the centre of the town so called. λ 30 41 0·10 L 71 48 34·50 No. 229	**Akíl** s. (*Multán*) On the Bár and close to a well so called. Marked by a kachá platform. λ 30 28 3·19 L 72 8 44·24	**Asrúr Mosque.** (*Gújránwálá*) Spire of central of 3 domes of Mián Alí's Khángáh (Mosque). λ 31 47 4·5 L 73 41 28·8 Nos. 103, 104
Akbar, XIX. (*Vide page 5—G.*) λ 30 53 43·26 L 73 19 40·46 H 641 *h* 3· No. 19	**Alpá** s. (*Lahor*) On top of Dayá Sing Baniá's house; thánah Chochak, tahsíl Chúniá. Marked by a circular platform. λ 31 8 41·74 L 73 43 22·69 No. 150	**Aulkhán-kí-Búngá** s. (*Lahor*) On kachá masonry roof of a round tower in the centre of village, belonging to Salárá Sing, Zamíndár; thánah Miá, tahsíl Chúniá. Marked by a peg driven in. λ 31 12 21·85 L 73 56 10·39 No. 158
Akbar-da-Búnga, VII. (*Vide page 4—G.*) λ 30 12 32·43 L 73 31 18·78 H_s 538·35 *h* 29 Nos. 1, 9	**Asrúr, XXXIII.** (*Vide page 7—G.*) λ 31 47 2·58 L 73 41 25·76 H 740 *h* 8 No. 36	**Baggá** s. (*Lahor*) Mark. λ 31 32 24·30 L 73 46 49·32 Nos. 101, 102

Name of station, district, description, co-ordinates &c.

Baggá No. 2 s.
(*Jhang*) On top of Hastá Lambardár's house about the centre of the village so called.

	° ′ ″
λ	31 35 23·34
L	72 36 24·54

No. 206

Bahádar Kálí s.
(*Lahor*) On S.W. angle of a ruined fortalice, N.W. of temple so called, in the lands of and about 0·25 of a mile E. of Niwázbeg village. Marked by a circular platform with mark-stones.

λ	31 29 1·45
L	74 16 33·08

No. 177

Bahádar Kálí Temple.
(*Lahor*)

λ	31 29 0·2
L	74 16 53·7

Nos. 199, 200

Bála, XL.
(*Vide page* 8—*G.*)

λ	32 8 52·15
L	73 30 11·69
H	706
h	29

Nos. 44, 46

Ballo s.
(*Jhang*) On a small mound about 0·25 of a mile E. of village so called, on the side of the road from Jhang to Lahor and close to the 9th milestone.

λ	31 22 54·39
L	72 26 29·13

No. 211

Báreh-ká-khú s.
(*Multán*) About 0·25 of a mile N.W. of a well so called. Marked by a platform with a central paká pillar 4 ft. high.

λ	30 28 36·42
L	72 0 6·34

No. 236

Báwar s.
(*Multán*) On a mound about 2 miles S.W. of Sari Sádhu. A platform 2 ft. high and 6 ft. square with 2 ft. foundation, marks the station.

λ	30 36 1·96
L	71 58 36·42

No. 233

Bhát s.
(*Lahor*) On Chatar Sing's paká house in centre of village; thánah Káná, tahsíl Lahor. Marked by a circle and dot on roof.

λ	31 20 8·96
L	74 7 36·94

No. 167

Bhau-Sultán s.
(*Jhang*) On a mound in the grounds of and about 1·25 miles S.W. of village of that name.

λ	30 47 32·68
L	71 53 51·63

No. 226

Name of station, district, description, co-ordinates &c.

Bháwalgarh Fort,
(*Bháwalpúr*) Flag on gateway.

	° ′ ″
λ	30 9 54·6
L	73 31 54·6

Nos. 64, 65

Bhawání s.
(*Jhang*) On a small mound about 1 mile N.E. of village so called.

λ	31 32 41·23
L	72 41 19·48

No. 205

Bhind s.
(*Gogairá*) About 0·25 of a mile N. of the Railway and close to the village so called. Marked by a kachá platform.

λ	30 32 44·25
L	72 46 55·24

Bholágarhí s.
(*Lahor*) On a house in centre of village; thánah Káná, tahsíl Lahor. Marked by a pin driven into the wall.

λ	31 28 26·30
L	74 12 44·75

No. 174

Bhorá s.
(*Lahor*) On the S.E. corner of a small fortalice appertaining to the village of Bhorá commonly called Madrá; thánah Miá, tahsíl Chúniá.

λ	31 15 29·91
L	73 55 10·29

No. 159

Bungá Flag,
(*Gogairá*) On Zamíndár's kachá house in village.

λ	30 29 58·9
L	73 33 56·4

No. 75

Bungá (heliotrope)
(*Gogairá*)

λ	30 33 2·75
L	73 46 34·19

No. 74

Búrála, XXII.
(*Vide page* 6—*G.*)

λ	31 5 53·73
L	73 15 32·94
H	631
h	32

No. 24

Chail, XLVII.
(*Vide page* 9—*G.*)

λ	32 47 26·42
L	73 7 41·25
H	3687
h	3

No. 54

Name of station, district, description, co-ordinates &c.

Chambal Hill Cairn.
(*Jhilam*) Also called Mangaldeo Hill Cairn. Centre of cairn on hill.

	° ′ ″
λ	32 42 29·1
L	73 27 40·4

Nos. 130, 131

Chanání Temple.
(*Lahor*)

λ	31 22 25·3
L	74 7 28·3

Nos. 192, 193

Chaukí Chimney,
(*Lahor*) On Multán road.

λ	31 28 15·5
L	74 17 7·1

No. 198

Checháwatní No. 1 s.
(*Gogairá*) On a ridge of high land just above the Kachí, about 0·50 of a mile from the Rávi and 1·50 miles S.E. of the village. Marked by a kachá platform.

λ	30 33 56·24
L	72 44 59·70

Checháwatní No. 2 s.
(*Gogairá*) On a belt of high land above the Kachí; a continuous desert lies all around. Marked by a kachá platform.

λ	30 33 12·06
L	72 43 8·28

Chiliánwálá Monument.
(*Gujrát*) Centre of obelisk.

λ	32 39 45·8
L	73 38 51·2

No. 129

Chiniout, XXXII.
(*Vide page* 7—*G.*)

λ	31 43 31·28
L	73 0 58·32
H	835
h	4

No. 39

Chúngí s.
(*Lahor*) On S.W. angle of a ruined fortalice and 0·50 of a mile N.W. of the chaukí so called, on road to Multán; thánah Káná, tahsíl Lahor. Marked by a paká platform with usual marks.

λ	31 26 26·07
L	74 12 56·34

No. 173

Chúniál Tibbá s.
(*Jhang*) On a sand hill about 1 mile N.E. of village so called. A platform 6 ft. high and 6 ft. square with 2 ft. foundation, marks the station.

λ	30 58 51·77
L	71 54 7·82

No. 223

Name of station, district, description, co-ordinates &c.

Chúrawála, III.
(*Vide page* 3—*G.*)

	° ′ ″
λ	30 3 53·80
L	73 26 25·91
H	558
h	31

No. 4

Dabhar Tower,
(*Sháhpúr*) Centre of highest portion.

λ	32 25 34·4
L	73 16 0·9

No. 119

Daular Fort,
(*Gogairá*) Flag.

λ	30 31 37·6
L	73 30 49·2

Nos. 76, 77

Dhabbar, V.
(*Vide page* 3—*G.*)

λ	30 2 35·16
L	73 38 48·74
H	610
h	24

No. 16 of Sutlej Series. *Vide* Synoptical Vol. of that Series, page 10—*H.*

Dharmsing-ká-Kilá s.
(*Gogairá*) On a high paká house belonging to the family of Sardár Dharmsing; thánah Búchá, tahsíl Saiyidwálá. Marked by a circle and dot engraved on a stone and imbedded in the roof.

λ	31 14 50·17
L	73 47 28·11

No. 153

Dharrí Flag,
(*Gogairá*) On tree on hill.

λ	30 32 26·8
L	73 29 30·1

Nos. 78, 79

Dholánwál s.
(*Lahor*) On Wazír Mal Baniá's high house in centre of village, 0·20 of a mile N. of Multán road; thánah and tahsíl Lahor. Marked by a circle and dot on the roof.

λ	31 31 50·39
L	74 19 18·11

No. 180

Dilúr House.
(*Jhilam*) Chimney in centre of Mr. Pardon's house near Chuá village.

λ	32 44 6·2
L	73 3 27·4

No. 146

Dipálpúr s.
(*Gogairá*) On Dattu Mal Baniá's high deserted paká house in centre of village; tahsíl Hujrá.

λ	30 40 1·21
L	73 41 46·56

Nos. 88, 89

Name of station, district, description, co-ordinates &c.

Dogra, XI.
(*Vide page* 4—*G.*)

	° ′ ″
λ	30 30 56·62
L	73 28 6·18
H	594
h	32

No. 11

Dográ-kí-Kháng áh.
(*Gújránwálá*)

λ	31 50 11
L	73 39 55

Dográ-kí-Kháng áh, E. Dome.
(*Gújránwálá*)

λ	31 50 10·4
L	73 39 53·9

Nos. 107, 108

Dográ-kí-Kháng áh, W. Dome.
(*Gújránwálá*)

λ	31 50 10·6
L	73 39 52·4

Nos. 105, 106

Doráwálá s.
(*Multán*) About 0·50 of a mile S. of the Railroad, close to the village so called. Marked by a kachá platform.

λ	30 27 52·60
L	72 29 56·02

Dúdhí s.
(*Lahor*) On a small knoll about 0·25 of a mile N.E. of the village; thánah Miá, tahsíl Chúniá. Marked by a platform with mark-stones at top and bottom.

λ	31 12 50·79
L	73 49 36·96

No. 154

Dúngrawálá s.
(*Multán*) About a mile W. and in the precincts of the village so called. Marked by a kachá platform.

λ	30 30 9·90
L	72 10 45·13

Farídpúr, XIII.
(*Vide page* 4—*G.*)

λ	30 31 18·12
L	73 39 13·37
H	597
h	31

No. 15

Fathi-Mirálí s.
(*Jhang*) About 0·50 of a mile S.E. of the well so called and about 500 yds. from the eastern bank of the Chináb. A platform 1 ft. high and 6 ft. square with 1 ft. foundation and mark-stones at top and bottom, defines the station.

λ	30 38 16·27
L	71 52 21·67

No. 230

Name of station, district, description, co-ordinates &c.

Fatiáná s.
(*Gogairá*) About a mile S. of the village so called. Marked by a kachá platform.

	° ′ ″
λ	30 37 23·47
L	72 51 18·92

Fatti, XXXV.
(*Vide page* 7—*G.*)

λ	31 52 10·49
L	73 31 36·63
H	702
h	26

No. 37

Firoz, XXI.
(*Vide page* 5—*G.*)

λ	31 3 3·30
L	73 27 48·34
H	647
h	†

No. 23

Gágeh s.
(*Lahor*) On the highest kachá house in the centre of village; thánah Miá, tahsíl Chúniá. Marked by a peg driven into the wall.

λ	31 15 33·20
L	74 0 21·77

No. 162

Goperá s.
(*Lahor*) On Zamíndár's highest kachá house in village; thánah and tahsíl Lahor. Marked by a peg driven into the wall.

λ	31 29 52·93
L	74 14 37·03

No. 176

Gúnia, XLII.
(*Vide page* 8—*G.*)

λ	32 19 14·56
L	73 13 40·11
H	724
h	24

No. 48

Gurú-ká-Dilo s.
(*Lahor*) On a high prominent house belonging to persons of the Nának sect and apparently used for religious purposes; thánah Miá, tahsíl Chúniá. Marked by a circular platform, with circle and dot in its surface, over a pin driven into the roof.

λ	31 11 39·70
L	73 47 33·48

No. 152

Hamíntappá s.
(*Jhang*) On a mound of good height of the same name. There is a well at the foot of this mound belonging to a fakír.

λ	31 36 35·12
L	72 53 33·79

No. 203

† Not forthcoming.

Name of station, district, description, co-ordinates &c.

Hanjarwál s.
(*Lahor*) On a ridge of high kankar land, apparently the burial place of the surrounding villages, about 0·50 of a mile E. of Kakejá village and about 0·25 of a mile E. of the Multán road; thánah Anárkalí. Marked by a paká platform with mark-stones at top and bottom.

	° ′ ″
λ	31 30 9·00
L	74 19 5·19

No. 179

Harappá s.
(*Gogairá*) On the highest part of an extensive mound N. of the tahsíl of Harappá. Marked by a paká pillar.

λ	30 37 51·67
L	72 54 18·12

Havelí Flag,
(*Gogairá*) On Káká Baniá's house.

λ	30 26 58
L	73 44 24

Havelí s.
(*Gogairá*) On Zamíndár's high house in centre of village; tahsíl Pákpatan. A mark-stone imbedded in roof defines the station.

λ	30 26 58·44
L	73 44 24·80

No. 73

Havelí No. 2 s.
(*Jhang*) On a mound N.W. of village of same name.

λ	31 4 10·65
L	72 13 22·31

No. 218

Hazára, XXXIX.
(*Vide page* 8—*a*.)

λ	32 7 50·08
L	73 18 29·11
H	692
h	31

No. 43

Helá t.s.
(*Gujrát*) G.T.S. rejected tower station.

λ	32 29 49·42
L	73 41 57·79

No. 121

Húján, XXXIV.
(*Vide page* 7—*a*.)

λ	31 52 22·00
L	73 20 29·74
H	671
h	16

Nos. 38, 40

Hujrá s.
(*Gogairá*) On the house in centre of the fort used as tahsíl; thánah Hujrá. A mark-stone imbedded in roof defines the station.

λ	30 44 24·85
L	73 51 44·09

No. 90

Name of station, district, description, co-ordinates &c.

Ichrá s.
(*Lahor*) On a low mound W. of road from Ferozpúr to Anárkalí, about a mile S.E. of Ichrá village and about 0·25 of a mile W. of the Police chaukí so called; thánah Lahor. Marked by a circle and dot.

	° ′ ″
λ	31 30 33·47
L	74 21 57·87

No. 181

Isá-Fakír-dá-pindí s.
(*Jhang*) On a mound on the eastern bank of Chináb river. There is no village close to the station.

λ	31 12 12·81
L	72 18 5·80

Nos. 241, 242

Jabúáná s.
(*Jhang*) On top of Saijú Baniá's house in village of that name.

λ	31 6 4·63
L	72 7 47·59

No. 219

Jaibáhan s.
(*Jhang*) About 1 mile S.W. of village so called. A platform marks the station.

λ	30 52 53·08
L	71 56 57·82

No. 224

Jalálá-Dab s.
(*Jhang*) In dry bed of a branch of the Chináb about 0·50 of a mile W. of the well so called. The usual platform marks the station.

λ	30 42 56·69
L	71 54 27·12

No. 228

Jalálpúr House.
(*Gújránwálá*) Centre of staircase to roof of highest house in town.

λ	32 3 54·9
L	73 25 22·0

No. 115

Jalborwálá s.
(*Multán*) On a mound about 1·50 miles N.W. of Ráipúr village. A platform 2 ft. high and 6 ft. square with 2 ft. foundation, marks the station.

λ	30 30 37·21
L	71 55 27·54

No. 234

Jalláwálá s.
(*Multán*) In a large plain about 1 mile S.W. of the village so called. Marked by a kachá platform.

λ	30 30 52·52
L	72 7 47·07

Jámbrá Flag,
(*Gogairá*) On a babúl tree in Zamíndár's compound.

λ	31 2 39·1
L	73 20 50·4

No. 99

Name of station, district, description, co-ordinates &c.

Jandorá Shiválá,
(*Gujrát*) Spire on summit.

	° ′ ″
λ	32 30 48·8
L	73 32 46·4

Nos. 125, 126

Jáolí, XXXVIII.
(*Vide page* 10—*a*.)

λ	33 16 48·84
L	73 12 53·69
H	1918
h	2

Nos. 56, 61

Jeto, XLI.
(*Vide page* 8—*a*.)

λ	32 16 53·31
L	73 24 34·78
H	714
h	34

No. 47

Jhang s.
(*Jhang*) On Ismáíl Khán Lambardár's house on S. side of the city of that name.

λ	31 18 14·18
L	72 22 0·30

No. 213

Jhúlán, IV.
(*Vide page* 3—*a*.)

λ	30 3 21·90
L	73 16 44·25
H	534
h	20

No. 7

Jhundwálá s.
(*Multán*) About 100 yds. S. of the Trunk Road and close to a well so called. Marked by a kachá platform.

λ	30 30 22·54
L	72 13 22·82

Jhungwálá s.
(*Multán*) In the Kachí, amidst a dense jungle of jháú, and called after a collection of wells. Marked by a kachá platform.

λ	30 31 21·32
L	72 24 16·82

Jíwan Sing Flag,
(*Gogairá*) On tower in fort.

λ	30 44 34·9
L	73 41 9·3

No. 93

Jogí-ká-Asan Dome.
(*Lahor*)

λ	31 22 37·7
L	74 11 42·0

No. 195

Name of station, district, description, co-ordinates &c.

Jogí-Tilá, XXXVI.
(*Vide page* 10—*G.*)

	° ′ ″
λ	32 51 33·55
L	73 28 50·66
H	3200
h	2

Nos. 55, 59

Jogí-Tíla Hill Tomb.
(*Jhilam*) Spire of tomb on summit.

λ	32 51 38·1
L	73 28 41·3

Nos. 147, 148

Johárki, II.
(*Vide page* 3—*G.*)

λ	29 56 42·38
L	73 31 8·01
H	577
h	11

No. 5

Kachá Paká Flag,
(*Gogairá*) On a Baniá's house in village.

λ	30 36 20·7
L	73 34 57·9

Nos. 85, 86

Kadar, XLV.
(*Vide page* 9—*G.*)

λ	32 25 25·41
L	73 31 44·79
H	752
h	20

Nos. 50, 52

Kadiánwála, XV.
(*Vide page* 5—*G.*)

λ	30 38 5·54
L	73 31 21·60
H	587
h	26

Nos. 14, 16.

Kájkot, XIV.
(*Vide page* 4—*G.*)

λ	30 37 37·53
L	73 19 0·05
H	595
h	25

No. 13

Kakúwálá s.
(*Jhang*) On the highest paká house belonging to the Lambardár in village of that name.

λ	30 57 34·04
L	72 9 9·56

Nos. 247, 248

Kaliáná Flag,
(*Gogairá*) On Kúrá Lambardár's house.

λ	30 15 37·8
L	73 16 13·3

No. 68

Name of station, district, description, co-ordinates &c.

Kalowál s.
(*Sháhpúr*) On top of Lambardár's house about the centre of village so called.

	° ′ ″
λ	31 54 48·02
L	73 5 27·96

No. 201

Kapúrwálá h.s.
(*Jhang*) On a sand hill about 1 mile N.W. of village so called.

λ	30 51 18·70
L	71 50 21·36

No. 225

Karangal Hill Cairn.
(*Jhilam*) Centre of cairn, E. of pass between Pind Dádan Khán and Chakwálí.

λ	32 45 48·4
L	73 4 10·8

Nos. 144, 145

Ker, XLVIII.
(*Vide page* 9—*G.*)

λ	32 31 12·28
L	73 39 9·75
H	772
h	†

No. 57

Khái s.
(*Lahor*) On roof of a round tower belonging to Nechal Dás in centre of village; thánah Miá, tahsíl Chúniá. Marked by a pin and circle.

λ	31 18 15·23
L	73 58 58·77

No. 163

Khángarwála, XVII.
(*Vide page* 5—*G.*)

λ	30 45 21·25
L	73 16 34·24
H	602
h	31

No. 18

Khánpúr s.
(*Gogairá*) On the S.W. corner of the sarái gateway; thánah Búchá, tahsíl Saiyidwálá. Marked by a circle and dot.

λ	31 13 5·21
L	73 42 12·29

No. 149

Khiwá s.
(*Jhang*) On edge of a ravine about 200 yds. W. of the well so called. Marked by a platform 9 ft. high.

λ	31 38 7·80
L	72 42 39·12

No. 204

Khúdpúr s.
(*Lahor*) On roof of the highest paká house belonging to Hakeká Sing Zamíndár; thánah Káná, tahsíl Lahor. Marked by a pin and circle.

λ	31 23 27·14
L	74 8 21·92

No. 169

Name of station, district, description, co-ordinates &c.

Khúrnawála, XXIX.
(*Vide page* 6—*G.*)

	° ′ ″
λ	31 29 53·31
L	73 18 51·05
H	653
h	30

Nos. 32, 34

Kimiáwálí s.
(*Gogairá*) On the Bár about 0·50 of a mile N. of the Railway. Marked by a kachá platform.

λ	30 34 10·30
L	72 49 22·40

Kiráná Tomb Dome,
(*Sháhpúr*) Pír Sukál's.

λ	31 57 59·6
L	72 44 38·9

Nos. 113, 114

Koár, XLIX.
(*Vide page* 9—*G.*)

λ	32 47 22·70
L	73 44 10·51
H	1367
h	2

No. 58

Kokro-kí-Jogí s.
(*Lahor*) About 50 yds. from the Rávi, near a few deserted hamlets so called, and about 0·50 of a mile N.E. of Kokro village; thánah Miá, tahsíl Chúniá. Marked by a paká platform.

λ	31 13 6·65
L	73 52 25·45

No. 157

Kot-Baksha, VI.
(*Vide page* 4—*G.*)

λ	30 10 34·85
L	73 19 1·50
H	557
h	30

No. 8

Kothiála, XLVI.
(*Vide page* 9—*G.*)

λ	32 35 26·74
L	73 30 12·16
H	765
h	30

No. 53

Kot-Rustam s.
(*Jhang*) On top of a Baniá's house in village of that name.

λ	31 1 3·00
L	72 7 16·51

No. 220

Kusak Tomb,
(*Jhilam*) Minaret.

λ	32 42 32·9
L	73 6 26·5

Nos. 142, 143

† Not forthcoming.

Name of station, district, description, co-ordinates &c.

Lálúpúr Flag,
(*Gogairá*) On a Baniá's kachá house in village.

	° ′ ″
λ	30 37 25·7
L	73 36 35·8

No. 87

Lambeh s.
(*Lahor*) On top of a round turret of a conspicuous house owned by Khudá Sing ját; thánah Miá, tahsíl Chúniá. Marked by a pin driven into the roof.

λ	31 13 20·85
L	73 58 4·33

No. 160

Lodri, XXXVII.
(*Vide page* 8—*a*.)

λ	32 0 1·45
L	73 17 29·62
H	658
h	18

No. 42

Mádhowálí s.
(*Gogairá*) About 0·75 of a mile S. of the Railway Station so called. Marked by a kachá platform with a stout peg in centre.

λ	30 35 24·98
L	72 56 41·15

Madhukáwá s.
(*Jhang*) On a mound so called, about 0·25 of a mile N. of Samandríwálá well.

λ	31 7 48·33
L	72 19 23·22

No. 216

Maghiáná Church.
(*Jhang*)

λ	31 16 14·6
L	72 21 46·6

Nos. 243, 244

Maghiáná Magazine.
(*Jhang*)

λ	31 16 6·7
L	72 21 44·8

Nos. 239, 240

Maghiáná s.
(*Jhang*) On Baherá Sing's house about the N. W. corner of the city of same name.

λ	31 16 40·00
L	72 20 57·95

Nos. 237, 238

Mahmúdpúr s.
(*Multán*) About 0·25 of a mile W. of the small village so called. Marked by a kachá platform.

λ	30 29 2·41
L	72 5 39·95

Majáng s.
(*Lahor*) On mound 0·24 of a mile S. of that village; thánah and tahsíl Lahor. A paká pillar 1 ft. high and 3 ft. in diameter with mark-stones at top and bottom, defines the station.

λ	31 33 5·43
L	74 21 34·37

No. 182

Name of station, district, description, co-ordinates &c.

Májrá Tomb Spire,
(*Gogairá*) On mound.

	° ′ ″
λ	31 1 57·5
L	73 36 42·6

Nos. 97, 98

Malakwál Tomb.
(*Sháhpúr*) Minaret of domed tomb on left bank of Jhilam river.

λ	32 33 35·3
L	73 15 8·8

Nos. 127, 128

Máleh-kí-Búngá s.
(*Lahor*) On Hirá Sing Zamíndár's house; thánah Miá, tahsíl Chúniá. Marked by a pin driven into the roof.

λ	31 11 18·53
L	73 52 29·77

No. 156

Malka, XII.
(*Vide page* 4—*a*.)

λ	30 26 28·30
L	73 19 4·54
H	563
h	31

No. 12

Malká Village Flag,
(*Gogairá*) On a Baniá's paká house.

λ	30 25 27·0
L	73 18 59·4

No. 70

Mámúdeh, I.
(*Vide page* 3—*a*.)

λ	29 55 25·19
L	73 20 59·48
H	569
h	14

No. 6

Mámúsher-ká-Bher s.
(*Multán*) On the highest part of a high mound (the remains of a fort) about 0·75 of a mile S. of Tulambá. Marked by a peg driven into a kachá platform.

λ	30 30 37·57
L	72 17 7·29

Mandowálí s.
(*Jhang*) On a mound about 500 yds. S.W. of the well called Bálárao.

λ	31 28 38·57
L	72 36 44·16

No. 207

Mangá Dome,
(*Lahor*) Puráná.

λ	31 17 36·0
L	74 8 29·0

No. 194

Name of station, district, description, co-ordinates &c.

Mangá No. 1 s.
(*Lahor*) On a mound near a well belonging to Keso, on opposite bank of the river to that occupied by Mangá village; thánah Káná, tahsíl Lahor. Marked by a long and stout peg driven into the ground.

	° ′ ″
λ	31 19 37·48
L	74 4 16·96

No. 165

Mangá No. 2 s.
(*Lahor*) On the highest paká house in village belonging to Nanda Sing Zamíndár; thánah Káná, tahsíl Lahor. Marked by a circle and dot on roof.

λ	31 18 40·52
L	74 5 41·22

No. 166

Masúdáná h.s.
(*Jhang*) On a sand hill, the burial place of a Muhammadan Pír of that name, about 2 miles S. of Khokar village.

λ	30 45 41·71
L	71 44 27·70

Nos. 249, 250

Mathuá s.
(*Lahor*) On the deserted site of the village so called, and about 0·50 of a mile N. of the present site. Marked by a paká pillar, on a raised platform, with mark-stones.

λ	31 15 51·55
L	73 58 35·42

No. 161

Mega, XXIII.
(*Vide page* 6—*a*.)

λ	31 5 22·69
L	73 41 32·18
H	652
h	33

No. 27

Miá Temple,
(*Lahor*) Dome.

λ	31 12 24·3
L	73 59 11·2

Nos. 188, 189

Miánmir s.
(*Lahor*) About 0·15 of a mile S.W. of the well known village of that name; thánah and tahsíl Lahor. A paká pillar 1 ft. high and 3 ft. in diameter with mark-stones at top and bottom, defines the station.

λ	31 32 44·90
L	74 23 50·01

No. 183

Mochíwálá s.
(*Jhang*) On a mound so called about 0·50 of a mile N. W. of Gurwawálá Khú.

λ	31 18 6·17
L	72 29 58·14

No. 212

Name of station, district, description, co-ordinates &c.

Moháraválá, XXVI.
(*Vide page* 6—*G.*)

	° ′ ″
λ	31 22 34·46
L	73 27 6·30
H	667
h	42

No. 29

Molánwál s.
(*Lahor*) On the highest house (Abdul Karím's) in village so called; thánah Káná, tahsíl Lahor. Marked by a pin driven into the roof.

λ	31 24 36·93
L	74 10 46·05

No. 171

Moní-Dhai, VIII.
(*Vide page* 4—*G.*)

λ	30 13 19·98
L	73 43 23·39
H	593
h	30

No. 46 of Sutlej Series. *Vide* Synoptical Vol. of that Series, page 11—*H.*

Mosque No. 1.
(*Bhawalpúr*) In wilderness.

λ	30 3 5·4
L	73 23 46·6

Nos. 62, 63

Mosque No. 2.
(*Bhawalpúr*) In wilderness.

λ	30 3 5
L	73 23 38

Mughul-Sarái Dák Bungalow,
(*Lahor*) Chimney.

λ	31 10 23·3
L	73 51 37·0

No. 186

Mughul-Sarái s.
(*Lahor*) On the vaulted roof of W. gateway of the old Sarái, about 0·25 of a mile N. of the new encamping ground on the road from Lahor to Gogairá; thánah Miá, tahsíl Chúniá. Marked by a circle and dot.

λ	31 10 32·78
L	73 51 13·01

No. 155

Mughul-Sarái Tomb,
(*Lahor*) Dome.

λ	31 10 20·4
L	73 51 12·5

No. 187

Múgo, XXXVI.
(*Vide page* 7—*G.*)

λ	32 0 39·77
L	73 27 0·26
H	695
h	36

No. 41

Name of station, district, description, co-ordinates &c.

Murulwálá s.
(*Jhang*) On Mabhabbur Lambardár's house, on W. side of the village so called.

	° ′ ″
λ	31 32 12·18
L	72 31 19·65

No. 208

Nánádogá s.
(*Lahor*) On a kachá house in centre of village; thánah Káná, tahsíl Lahor. Marked by a pin driven into the roof.

λ	31 21 55·00
L	74 4 44·55

No. 168

Nánaksar s.
(*Jhang*) On a two-storied house belonging to the Mahant of the fakírs, in the centre of a small fort.

λ	31 10 3·88
L	72 25 27·13

No. 214

Nankháná Samád,
(*Lahor*) Spire of Dome.

λ	31 26 43·6
L	73 44 14·2

No. 100

Nár, XLIV.
(*Vide page* 8—*G.*)

λ	32 27 20·34
L	73 18 44·50
H	737
h	31

No. 49

Nára, XXVIII.
(*Vide page* 6—*G.*)

λ	31 24 56·82
L	73 37 14·15
H	690
h	11

No. 30

Nautheh Flag,
(*Gogairá*) On Zamíndár's kachá house.

λ	30 33 54·2
L	73 22 17·2

No. 83

Nauthiá s.
(*Lahor*) On a paká house belonging to the Gurús of the place and within the enclosure marking their residence; thánah Miá, tahsíl Lahor. Marked by a pin driven into the roof.

λ	31 16 30·25
L	74 2 32·49

No. 164

Nauthiá Tower,
(*Lahor*) In village.

λ	31 15 25·5
L	74 2 31·4

Nos. 190, 191

Name of station, district, description, co-ordinates &c.

Niká s.
(*Jhang*) Also called Laká s. On top of Sobhá Rám Lambardár's house in centre of small village so called.

	° ′ ″
λ	31 27 41·73
L	72 32 40·73

No. 209

No. 1 s.
(*Gogairá*) About a mile N. of the Railway. Marked by a kachá platform 5 ft. high.

λ	30 40 56·11
L	73 11 57·88

No. 2 s.
(*Gogairá*) Marked by a kachá platform 5 ft. high.

λ	30 45 5·95
L	73 10 19·48

No. 3 s.
(*Gogairá*)

λ	30 41 43·51
L	73 7 45·92

No. 4 s.
(*Gogairá*)

λ	30 37 57·39
L	73 9 0·49

No. 5 s.
(*Gogairá*) Marked by a peg driven into a kachá platform 4 ft. high.

λ	30 40 18·57
L	73 6 3·72

No. 6 s.
(*Gogairá*) About 1·50 miles S. of the Railway. Marked by a peg driven into a mound 4 ft. high.

λ	30 37 1·87
L	73 5 14·40

No. 7 s.
(*Gogairá*) In the lands of a deserted hamlet called Jhok Sohuná and about 100 yds. N. of the road from Lahor to Multán. Marked by a kachá platform.

λ	30 39 47·48
L	73 2 3·82

No. 8 s.
(*Gogairá*) Marked by a kachá platform in a weird wild tract.

λ	30 36 26·91
L	73 1 14·51

No. 9 s.
(*Gogairá*) About 10 yds. N. of the Trunk Road. Marked by a kachá platform about 5 ft. high.

λ	30 38 40·10
L	72 58 22·96

Name of station, district, description, co-ordinates &c.

No. 10 s.
(*Gogairá*)
° ′ ″
λ 30 35 19·44
L 72 53 23·61

No. 11 s.
(*Gogairá*) In the Kachí. Marked by a kachá platform.
λ 30 36 25·70
L 72 48 24·56

No. 12 s.
(*Gogairá*) About 0·50 of a mile S. of the Trunk Road. Marked by a kachá platform.
λ 30 34 45·44
L 72 46 59·81

No. 13 s.
(*Gogairá*) On the Bár. Marked by a kachá platform.
λ 30 31 51·91
L 72 44 52·92

No. 14 s.
(*Gogairá*) On the Bár.
λ 30 31 42·97
L 72 42 18·09

No. 15 s.
(*Gogairá*) On the Bár. Marked by a kachá platform.
λ 30 30 28·16
L 72 36 21·70

No. 16 s.
(*Gogairá*) On the Bár, S. of the Trunk Road. Marked by a kachá platform.
λ 30 32 10·14
L 72 34 5·23

No. 17 s.
(*Gogairá*) On the Bár, in a dense jungle. Marked by a kachá platform.
λ 30 29 32·26
L 72 33 31·74

No. 18 s.
(*Gogairá*)
λ 30 30 58·63
L 72 31 23·47

No. 19 s.
(*Multán*) About 0·25 of a mile S. of the Trunk Road. Marked by a kachá platform.
λ 30 30 38·24
L 72 27 35·44

No. 20 s.
(*Multán*) On the Bár, in a dense jungle. Marked by a kachá platform.
λ 30 28 40·28
L 72 26 22·71

Name of station, district, description, co-ordinates &c.

No. 21 s.
(*Multán*) On the Bár. Marked by a kachá platform.
° ′ ″
λ 30 28 46·40
L 72 24 13·48

No. 22 s.
(*Multán*) On the Bár. Marked by a kachá platform.
λ 30 28 2·90
L 72 21 39·09

No. 23 s.
(*Multán*) On the Bár. Marked by a kachá platform.
λ 30 27 19·04
L 72 18 38·89

No. 24 s.
(*Multán*) On the Bár, in a wild and deep forest. Marked by a kachá platform.
λ 30 28 0·78
L 72 15 45·43

No. 25 s.
(*Multán*) On the Bár. Marked by a kachá platform.
λ 30 27 9·04
L 72 11 39·47

No. 26 s.
(*Multán*) In a wide plain on the Bár. Marked by a kachá platform.
λ 30 31 16·49
L 72 4 18·87

No. 27 s.
(*Multán*) On the Bár, N. of the Trunk Road. Marked by a kachá platform.
λ 30 28 35·34
L 72 2 18·47

No. 28 s.
(*Multán*) On the Bár, N. of the Trunk Road. Marked by a platform with a central paká pillar 4 feet high.
λ 30 30 55·02
L 72 0 39·22
No. 235

Paká s.
(*Multán*) About 0·75 of a mile N. of a well so called. Marked by a kachá platform.
λ 30 29 51·02
L 72 21 41·45

Paká Sidhárá Flag,
(*Gogairá*) On Daulat Lambardár's house.
λ 30 19 16·4
L 73 19 8·1
No. 69

Pák-Patan, IX.
(*Vide page* 4—G.)
λ 30 20 40·63
L 73 25 49·59
H 651
h 35
Nos. 3, 10

Name of station, district, description, co-ordinates &c.

Panjírí-ká-khú s.
(*Jhang*) About 0·25 of a mile S.E. of the well so called. A platform 6 ft. high and 6 ft. square with 2 ft. foundation, marks the station.
° ′ ″
λ 30 38 52·89
L 71 55 39·05
No. 231

Phení s.
(*Lahor*) On top of a two-storied house in village; thánah Káná, tahsíl Lahor. Marked by an iron peg with a circle and dot.
λ 31 26 59·92
L 74 9 42·72
No. 172

Phosi, XVI.
(*Vide page* 5—G.)
λ 30 45 13·35
L 73 27 50·41
H 629
h 22
No. 17

Pindi, XVIII.
(*Vide page* 5—G.)
λ 30 46 51·16
L 73 38 31·01
H 634
h 32
No. 21

Pindí Phatián Kachahrí.
(*Gújránwálá*) Spire of old Kachahrí.
λ 31 54 4·7
L 73 18 52·8
Nos. 111, 112

Pindí Phatián Tomb Spire,
(*Gújránwálá*) Khair Muhammad's.
λ 31 54 4·4
L 73 18 55·9
Nos. 109, 110

Pípal-Mirálí s.
(*Multán*) On N.E. side of village of that name. Marked by a kachá tower 11 ft. high.
λ 30 35 30·46
L 71 54 3·26
No. 232

Pír Gadá Red Tomb,
(*Gogairá*) Spire, in jungle.
λ 30 35 8·4
L 73 39 21·3
No. 84

Pír-Ghani, X.
(*Vide page* 4—G.)
λ 30 23 0·57
L 73 37 38·90
H 589
h 32
No. 2

Name of station, district, description, co-ordinates &c.

Pír Khális Khángáh,
(*Bháwalpúr*) Spire.

	o ′ ″
λ	30 15 35·3
L	73 38 1·1

Nos. 66, 67

Ratowál s.
(*Gujrát*)

λ	32 27 1·63
L	73 32 18·59

No. 120

Rerká Tower.
(*Sháhpúr*) Centre of highest tower.

λ	32 16 47·8
L	73 17 27·9

No. 118

Revenue Survey Pillar,
(*Gujrát*) At junction of boundaries of Lálá-kí-pindí, Murálá and Jaisukh villages.

λ	32 30 44·1
L	73 39 33·7

No. 124

Rirána, XXVII.
(*Vide page* 6—*G.*)

λ	31 21 23·08
L	73 15 52·68
H	637
h	30

No. 33

Roatála, L.
(*Vide page* 10—*G.*)

λ	33 10 36·68
L	73 37 42·87
H	2147
h	2

No. 60

Roshisháni, XXV.
(*Vide page* 6—*G.*)

λ	31 13 54·62
L	73 34 35·85
H	655
h	37

Nos. 26, 28

R. S. (Revenue Survey) Platform s.
(*Gújránwálá*) At junction of villages Mián Matorá, Bará Matorá, Hazárí and Lorangí.

λ	32 1 8·68
L	73 27 50·89

No. 116

Rurálla, XXIV.
(*Vide page* 6—*G.*)

λ	31 13 20·17
L	73 23 57·54
H	649
h	30

No. 25

Name of station, district, description, co-ordinates &c.

Sadúlapúr, XLIII.
(*Vide page* 8—*G.*)

	o ′ ″
λ	32 14 52·28
L	73 38 11·63
H	733
h	26

No. 51

Saiyidwálá s.
(*Gogairá*) Flag on roof of Motí Baniá's three-storied house in village which is about 1·50 miles from its old site; thánah and tahsíl Saiyidwálá.

λ	31 7 24·81
L	73 32 53·98

Nos. 95, 96

Sajádá Tomb,
(*Gújránwálá*) Large domed.

λ	31 56 50·0
L	73 43 59·7

No. 117

Salábat s.
(*Gogairá*) On top of a house in the hamlet belonging to and about 500 yds. W. of village so called; thánah Chochak, tahsíl Gogairá. Marked by a circular platform with circle and dot.

λ	31 8 12·78
L	73 39 46·06

Nos. 184, 185

Salt Range No. 1, Dome
(*Jhilam*) Of small building with enclosure.

λ	32 38 58·6
L	72 44 38·0

Nos. 132, 133

Salt Range No. 2, Tomb,
(*Jhilam*) Or house.

λ	32 41 22·2
L	72 45 41·8

Nos. 134, 135

Salt Range No. 3, Tomb.
(*Jhilam*) Centre of lantern-like dome.

λ	32 41 5·5
L	72 50 27·7

Nos. 136, 137

Salt Range No. 4, Cairn.
(*Jhilam*) On central and highest of 3 peaks.

λ	32 42 50·1
L	72 50 33·9

Nos. 138, 139

Salt Range No. 5, Cairn
(*Jhilam*) Of stones.

λ	32 40 39·4
L	72 58 13·9

Nos. 140, 141

Sandrání s.
(*Gogairá*) On top of Zamíndár's high paká house; thánah Búchá, tahsíl Saiyidwálá. Marked by a small circular platform 6 in. high with a circle and dot.

λ	31 13 17·32
L	73 45 29·22

No. 151

Name of station, district, description, co-ordinates &c.

Sángla, XXXI.
(*Vide page* 7—*G.*)

	o ′ ″
λ	31 42 37·92
L	73 25 32·97
H	839
h	2

No. 35

Sangvewálá s.
(*Jhang*) On a mound 0·75 of a mile N.E. of Bahádurkot village. A platform 6 ft. high and 6 ft. square with 2 ft. foundation, marks the station.

λ	30 59 9·81
L	72 0 9·48

No. 222

Sátgarra, XX.
(*Vide page* 5—*G.*)

λ	30 54 47·44
L	73 32 57·27
H	636
h	21

Nos. 20, 22

Sátgarra Town Flag,
(*Gogairá*) On Mír Sing's empty house.

λ	30 55 0·9
L	73 33 17·4

No. 94

Sáwá s.
(*Gogairá*) In the Kachí, about 0·50 of a mile S.E. of the ruined village so called. Marked by a kachá platform.

λ	30 33 42·90
L	72 37 22·70

Shádíwál s.
(*Lahor*) On a house in centre of village belonging to the headman; thánah and tahsíl Lahor. Marked by a peg driven into the wall.

λ	31 30 32·73
L	74 15 39·53

No. 178

Sháh Ikká s.
(*Gogairá*) Old rejected station, on the mound at the foot of which lies the village so called; tahsíl Hujrá. Marked by a peg driven in.

λ	30 34 56·83
L	73 32 44·11

Nos. 81, 82

Sháhjamál, XXXVIII.
(*Vide page* 8—*G.*)

λ	32 1 38·03
L	73 36 15·56
H	710
h	25

No. 45

Sháhjioná s.
(*Jhang*) On top of Santú Baniá's house about the centre of village so called.

λ	31 31 12·63
L	72 22 48·64

No. 210

Sháhpúr Dome.
(*Lahor*)

	° ′ ″
λ	31 27 33·1
L	74 15 13·7

Nos. 196, 197

Sháhpúr s.
(*Lahor*) On top of highest house in village; thánah Káná, tahsíl Lahor.

λ	31 28 0·96
L	74 14 34·84

No. 175

Shá-Kot, XXX.
(*Vide page 7—a.*)

λ	31 34 12·51
L	73 30 13·13
H	771
h	4

No. 31

Shámgarh Flag,
(*Gogairá*) On Zamíndár's high square kachá house.

λ	30 27 32·6
L	73 29 16·1

Nos. 71, 72

Shatánwálá s.
(*Jhang*) On a mound about 1·50 miles S.W. of Pír Abdul Rahmán village.

λ	30 44 3·35
L	71 49 59·86

No. 227

Shergarh Tomb,
(*Gogairá*) Dome, N. of town.

λ	30 49 50·5
L	73 46 50·4

No. 91

Shorkot s.
(*Jhang*) On top of house situated on a very high mound apparently the site of a large fort.

	° ′ ″
λ	30 49 58·51
L	72 6 43·23

Nos. 245, 246

Sukhpúr Flag,
(*Gogairá*) On a Zamíndár's kachá house in village.

λ	30 33 35·8
L	73 36 6·9

No. 80

Sundáh s.
(*Gogairá*) About a mile N.W. of the well so called. Marked by a kachá platform.

λ	30 31 2·01
L	72 39 2·97

Sundar s.
(*Lahor*) On a high old brick-kiln about 500 yds. W. of the village; thánah Káná, tahsíl Lahor. Marked by a paká pillar 2 ft. high and about 4 ft. in diameter, with marks.

λ	31 21 36·04
L	74 9 42·26

No. 170

Surab h.s.
(*Sháhpúr*)

λ	31 56 15·90
L	72 49 22·07

No. 202

Tázípindí s.
(*Jhang*) On a mound about 0·25 of a mile W. of Mausúr-Siál village.

	° ′ ″
λ	31 8 37·13
L	72 13 39·34

No. 217

Tobáh s.
(*Gogairá*) About 0·50 of a mile S. of the well so called. Marked by a kachá platform.

λ	30 33 27·13
L	72 40 30·74

Tomb in Jungle.
(*Gogairá*)

λ	30 41 37·7
L	73 39 8·4

No. 92

Tomb of Mirzá Sukálí.
(*Gujrát*) Centre of dome, S. of Helá t.s.

λ	32 28 48·4
L	73 42 10·4

Nos. 122, 123

Uch s.
(*Jhang*) On a three-storied house in village so called.

λ	31 8 2·62
L	72 1 2·16

No. 221

Vigráná-Siál s.
(*Jhang*) On a mound N. of Bhirwálá well owned by Bándá.

λ	31 12 47·57
L	72 19 0·50

No. 215

September 1874.

J. B. N. HENNESSEY.

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SUTLEJ SERIES.

SUTLEJ SERIES.

INTRODUCTION.

On the completion of the revision of the Great Indus Series, Lieutenant J. Herschel, R.E. was instructed by the Surveyor General to carry an oblique series of triangles, with the 36-inch theodolite, along the left bank of the Sutlej, to tie up the meridional series running through the Panjáb, and to form a basis for future triangulation into the deserts of Sind and Rájputána. This Chain of Triangles, which is single throughout, emanates from the Great Indus Series, and follows the left bank of the Sutlej from its junction with the Indus, near Mithankot, to a side of the Gurhágarh Meridional Series, near Ferozpúr. The series was commenced under the instructions of Colonel A. Scott Waugh, R.E., in the field season of 1860-61, and was completed at the close of the field season 1862-63 under the orders of Major J. T. Walker, R.E., who was appointed to officiate as Superintendent of the Great Trigonometrical Survey on Colonel Waugh's retirement from the service in March 1861.

The Sutlej Series originated from the side Sháhpur—Lanjiwár of the Gola polygon of the Indus Series, but as it was afterwards connected with the side Lanjiwár—Tárú of the same polygon, the four first triangles of the Sutlej Series have been incorporated into the Kahírí, Gola and Dago (triple) polygon of the Indus, thus converting the figure into a polygon with four centres, the observations and reductions of which are given in the records of the Indus Series. The Sutlej triangulation is therefore considered to emanate from the side Lálúwáli to Chuharlár.

Season 1860-61.

PERSONNEL.

Lieutenant J. Herschel, R.E., 2nd Assistant.
Mr. J. W. Armstrong, Civil 1st Assistant.
„ G. J. Ryall, 1st class Sub-Assistant.
„ W. F. Trotter, 2nd class do.

During the early part of the field season of 1860-61, Lieutenant Herschel was employed with the main portion of the establishment, in revising certain small portions of the Indus triangulation which had been executed with a 24-inch theodolite and which gave unusually large re-entering errors. While this revision was being carried on, a party under Mr. Armstrong proceeded to Mithankot to select stations and build towers on the line of the Sutlej. Consequently, on the completion of Lieutenant Herschel's work on the Indus, the approximate operations on the Sutlej Series were in a sufficiently advanced state to allow of the principal observations being commenced without delay. In the beginning of February 1861, therefore, Lieutenant Herschel commenced the measurement of the final angles, which was proceeded with steadily till the end of March,

though slowly, for an almost uninterrupted continuance of winds from the desert, kept the atmosphere in a more or less hazy state during the whole time. Observations were taken at 11 principal stations, forming 11 triangles which extend over a distance of about 50 miles and cover an area of 563 square miles. A few secondary points of importance were fixed and the usual system of reciprocal vertical observations was pursued. Lieutenant Herschel took astronomical observations for the direct determination of azimuth at Paphra T. S., about 40 miles from Mithankot. The field operations were brought to a close at Chanikhán T.S., on 5th April 1861, on which date Lieutenant Herschel and his party commenced their march to quarters, arriving at Dehra early in May.

Mr. Armstrong made good progress in the approximate operations; 38 stations were selected, the rays between them cleared, and 18 towers built by him and his assistant Mr. G. Ryall, who had been employed during the early part of the season in preparing the figures of the southern section of the Indus Series for revision. By the end of March, the approximate series was extended over a direct distance of 200 miles, to the vicinity of Pák Patan at the southern extremity of the Jogi-Tila Series, with which a symmetrical junction was effected. Mr. Trotter acted throughout the field season as Lieutenant Herschel's assistant in the office and observatory. He subsequently resigned his appointment in the survey department, on obtaining an Ensign's Commission in H. M's. 34th Regiment.

During the field season of 1860-61, the levelling operations under Captain B. R. Branfill, were extended from the Indus Series along the proposed line of the Sutlej Series to Ferozpúr; thence, to Ludhiána and Ambálla, to close eventually on the Dehra Dún base-line. The levels diverge from the Indus Series at Murghai bench-mark in the Dera Gházi Khán district, cross the Indus a few miles below Mithankot and traverse the district roads *viâ* Ahmadpúr, Bháwalpúr and Bháwalgarh to Ferozpúr: thence, they proceed along the Grand Trunk road to Ambálla, where the season's operations were closed. Only a few of the principal trigonometrical stations of the Sutlej Series were ready to be connected when the levelling operations were carried through the Bháwalpúr state: stone bench-marks were therefore fixed at distances of 10 to 12 miles apart for eventual connection with the triangulation, and the heights of the most permanent milestones met with by the road side were also determined for future reference by Canal or other Engineers engaged in levelling operations. The length of the main line levelled over during the season was 455 miles: of this distance, the first 100 miles was executed by three independent observers, Captain Branfill, Mr. Carty and Rámchand. The remaining portion was levelled over independently by Captain Branfill and Mr. Carty, while Rámchand executed 175 miles of branch circuits, connecting the trigonometrical stations of the Sutlej Series, from its origin as far as Bháwalpúr.

Season 1861-62.

PERSONNEL.

Lieutenant J. Herschel, R.E., 1st Assistant.
Mr. J. W. Armstrong, Civil 1st Assistant.
„ G. J. Ryall, 1st Class Sub-Assistant.
„ J. T. Burt, 3rd Class do.

Owing to the unprecedented duration of the rains in 1861, the party did not take the field till 13th October, when it marched *viâ* Ambálla and Ludhiána to Ferozpúr. Shortly before reaching Ferozpúr, Lieutenant Herschel and Mr. Armstrong connected the Daráoli and Tamálawála towers of the Gurhágarh Meridional Series, by simultaneous vertical

observations, with the bench-marks at Dagru and Kalian, the heights of which had been determined the previous season by the levelling operations. After this, a detachment, under Mr. Armstrong, branched off southwards to continue the approximate series, while the main party proceeded by water down the Sutlej to the station where work had been closed the previous season near Ahmadpúr.

Principal observations were commenced at Sálúkhel T.S. on 23rd November and continued till 12th April, during which time the triangulation was extended over a distance of about 150 miles in length, to the vicinity of the Jogi-Tila Series, by 27 triangles comprising an area of 1,400 square miles.

The southern flank of the series rests on the sand hills skirting the desert, while the northern flank is in the lowlands which are periodically inundated by the Sutlej: thus the greater portion of the rays traverse moist jungles of tamarisk and long grass, alternating with ridges of sand, forming a combination which proved peculiarly troublesome in disturbing the atmosphere, and causing lateral refraction to perplex and weary the observer and impair his measures. A large proportion of the angles were measured by night only, on account of imperfect visibility of the signals during the day; this considerably retarded the progress of the work.

Lieutenant Herschel has given the following interesting table as a test of the accuracy of his work. His mean triangular error is 0″·53, and in 85 angles his mean probability of error is 0″·25 between extremes of 0″·10 and 0″·38.

A MAXIMUM DIFFERENCE BETWEEN OBSERVATIONS.

B Number of measures in a set.	0″ to 1″	1″ to 2″	2″ to 3″	3″ to 4″	4″ to 5″	5″ to 6″	6″ to 7″	7″ to 8″	8″ to 9″	Total
2	1	0	0	0	0	0	0	0	0	1
3	223	251	93	0	0	0	0	0	0	567
4	3	13	65	22	1	0	0	0	0	104
5	0	5	4	29	13	1	0	0	0	52
6	0	0	0	5	11	5	3	0	0	24
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	1	0	1
9	0	0	0	0	1	0	0	0	0	1
Total	227	269	162	56	26	6	3	1	0	750

Total 0″ to 3″ = 658. Total greater than 3″ = 92.

In this Table the unit is a set of measures of an angle on a single zero, the arguments being **A** the maximum difference between the respective measures forming a set, and **B** the number of measures.

Observations to circumpolar stars for the determination of azimuths of verification were taken at Ládimsir and Mandresa, 71 miles apart, which were favourably situated for the purpose, being on sand hills in a perfectly desert country, without any cultivation or water within a considerable distance. Lieutenant Herschel introduced an improvement in the referring marks then used in the survey department. Instead of having two apertures, one for a lamp and the other for a heliotrope, he made both lamp and heliotrope illuminate the same piece of ground glass, the aperture of which was limited by a circular diaphragm of diameter suitable to the distance. Thus one object is intersected instead of two, and there is no flickering or unsteadiness of signal from wind or imperfect direction of heliotrope; there is no dazzle from too bright a sun, nor total disappearance in its absence, for the mere reflection of the sky is sufficient to illuminate the glass in tolerably clear weather, if the mark is not too far off. One mile was found to be the best distance for such a mark.

All the principal towns and villages along the line of the series were fixed when practicable. Lieutenant Herschel reports that "they are necessarily few in number, as the country "is more and more thinly populated from Ahmadpúr eastward as far as the British boundary. "From Bháwalpúr to Fázilka, the towns become fewer and of less importance, reaching a "climax of insignificance in Bháwalgarh, the capital of nearly half the state, which is nothing "but a hamlet without a single paka house in it; it derives its importance apparently from "nothing but the prestige of an old ruined fort, and the residence in it of the temporary "holder of the largest (but by no means the richest) Kárdári in the states. The country "is singularly poor in mosques, temples, tombs, or indeed prominent buildings of any "kind."

The approximate series, under Mr. Armstrong, was brought to a successful termination, by the selection of 14 stations extending over a distance of 80 miles, forming a junction with the Gurhágarh Meridional Series on the side Dhilan—Tamáláwála. The ray clearing and tower building was energetically carried on by Mr. G. Ryall, who completed 26 towers by the end of January, when he was deputed on secondary triangulation.

Season 1862-63.

PERSONNEL.

G. Shelverton Esquire, Civil Assistant.
Mr. G. J. Ryall, Senior Sub-Assistant.
„ M. C. Hickie, 1st Class do.
„ F. Bell, 2nd Class do.

In September 1862, Lieutenant Herschel's services being required at Head Quarters, the charge of the party was transferred to Mr. George Shelverton, who during the previous season had brought the field operations of the Gurhágarh Meridional Series to a termination. The party took the field as usual in October and during the course of the field season the triangulation was brought to a successful conclusion by its junction with the Gurhágarh Meridional Series.

The out-turn of work consisted of observations from 27 principal stations, all towers, forming 29 triangles which extend over a distance of 112 miles and embrace an area of 1366 square miles. The trigonometrical levelling was tested with the bench-mark at Akbar-da-Búnga (a principal station of the Jogi-Tila Series) near Bháwalgarh, at Núr Sháh Bodla, 40 miles further to the north-east, and again at Tamáláwála T. S. one of the terminal stations of the Sutlej Series. An Azimuth of verification was observed at Jambhera T. S.

Secondary triangulation in connection with the operations of the Sutlej Series.

In the field season of 1861-62 Mr. George Ryall carried a chain of triangles, about 30 miles in length, from the principal side Jhok-Godrí of the Sutlej Series with a 12-inch theodolite and connected it with the Multán minor triangulation which emanates from a principal side of the Indus Series and was executed with a 14-inch theodolite by Mr. J. W. Armstrong during season 1859-60: the results have been divided into two portions, all on the right bank of the river Chináb having been allotted to the Indus Series, and all on the left bank to the Sutlej Series. The line of division falls near the town of Sher Sháh, situated on the Chináb.

The Bháwalpúr minor triangulation executed with a 12-inch theodolite by Mr. George Ryall in season 1859-60, which emanates from a principal side of the Indus Series and is partly interlaced with the Sutlej triangulation, is divided into two portions. All on the right bank of the Chináb is allotted to the Indus Series, and all on the left bank to the Sutlej Series: the division lies near the junction of the Sutlej with the river Chináb.

In 1861-62 Mr. J. W. Armstrong executed a minor triangulation from Kájkot-Khángarwálá, a principal side of the Jogí-Tílá Series, over a distance of about 80 miles, with a 14-inch theodolite, following approximately along the river Rávi and the line of the Lahor and Multán Railway, and fixed *en route* the towns of Harappá, Checháwatní, Tulamba and Makdúmpur. In 1862-63 this secondary series was extended a further distance of about 130 miles by Mr. F. Bell with a 12-inch theodolite along both banks of the river Chináb, when he fixed the towns of Uch, Jhang and Maghiáná, closing upon the principal side Chiniout-Húján of the Jogí-Tílá Series on the north. The errors generated in these operations have been duly dispersed. The whole length of this minor triangulation is about 210 miles: it has been allotted to the Jogí-Tílá Series, and will be published in the synopsis of the results of that series.

In 1862-63 Mr. George Ryall carried a chain of triangles northwards, from the principal side Bahamníwálá-Dípoláná of the Sutlej Series, with a 7-inch theodolite and fixed the positions of Lahor, Miánmir and Amritsar, as well as the towns of Mamdot, Kanganpurá, Chúnián, Tháman, Kasúr, Luliáni, Waltoha, and Padhána. The length of the series to its junction with the principal side Jandokí-Rabzá of the Gurhágarh Series is about 90 miles; and the discrepancies generated have been duly dispersed. The triangulation south of Kasúr has been allotted to the Sutlej Series, and that portion north of the above named town, to the Gurhágarh Series; the latter will be published in the synopsis of the results of that series. During the same season Mr. G. Ryall carried on a net-work of minor triangulation on the south flank of the Sutlej Series, and connected therewith several of the external points intersected from the principal stations. The towns fixed by him are Mirzáwálá, Abohar, Malaut, Kot Bhái and Jhúmbá.

In 1862-63 Mr. M. C. Hickie, first of all carried on a minor triangulation with a 7-inch theodolite (west to east) parallel to the north flank of the Sutlej Series, and afterwards car-

ried it up north, and connected his work with the minor triangulation brought down from the Gurhágarh Series by Mr. A. W. Donnelly during season 1860-61 to fix Ferozpúr, and one of the points common to both, is the conspicuous chimney of the gun-foundry in the station.

Of some of the minor operations lying intermediately between the Sutlej and the Gurhágarh Series, it has been found convenient to allot a portion to each.

All towns and points of importance visible from principal stations, were fixed by observations taken to them from two or more stations with the great theodolite.

January 1875. H. KEELAN.

ALPHABETICAL LIST OF STATIONS.

NUMERICAL LIST OF STATIONS.

LXXXIII (of Great Indus Series.)	Chuharlár.
LXXXIV (of Great Indus Series.)	Lálúwálí.
I	Kandání.
II	Khánbelá.
III	Magrejá.
IV	Paphrá.
V	Chanikhán.
VI	Sálúkhel.
VII	Pirhár.
VIII	Nandlál.
IX	Núrkanch.
X	Hatejí.
XI	Dátekhán.
XII	Jhok.
XIII	Gosain.
XIV	Godri.
XV	Kabírwálá.
XVI	Bakhíderá.
XVII	Ládimsir.
XVIII	Gaddan.
XIX	Kaimsir.
XX	Támiwálí.
XXI	Kandá.
XXII	Shekhwahán.
XXIII	Nathal.
XXIV	Ghallú.
XXV	Berwálá.
XXVI	Jíwan.
XXVII	Arain.
XXVIII	Josar.
XXIX	Fatteh.
XXX	Mandresa.
XXXI	Gajiání.
XXXII	Bangar.
I	Mámúdeh. (of Jogí-Tílá Meridional Series.)
IV	Jhúlán. (of Jogí-Tílá Meridional Series.)
V	Dhabbar. (of Jogí-Tílá Meridional Series.)
VIII	Moní-Dhai. (of Jogí-Tílá Meridional Series.)
XXXIII	Jhambherá.
XXXIV	Fategarh.
XXXV	Jhandwálá.
XXXVI	Karníkherá.
XXXVII	Katerá.
XXXVIII	Dípoláná.
XXXIX	Bánáwálá.
XL	Bahamníwálá.
XLI	Bhágsar.
XLII	Joáríwálá.
XLIII	Múkantsingwálá.
XLIV	Bhangewálá.
XLV	Khárá.
XLVI	Farídkot.
LXVIII	Dhilan. (of Gurhágarh Meridional Series.)
LXX	Tamáláwálá. (of Gurhágarh Meridional Series.)

SUTLEJ SERIES.

DESCRIPTION OF STATIONS.

LXXXIII.—*(Of Great Indus Series).* Chuharlár Tower Station, lat. 28° 53′, long. 70° 41′, is situated about ½ a mile east of a hamlet so called. The town of Fattehpúr lies about 2 miles to the S.W., and that of Kádirpúr about the same distance to the N.W.

The pillar is perforated, and 24 feet high. It has a mark-stone on the ground floor.

LXXXIV.—*(Of Great Indus Series).* Lálúwálí Tower Station, lat. 28° 43′, long. 70° 42′, is situated in the Bháwalpúr territory, within the small village from which it takes its name. The town of Khánpúr is about 5 miles to the south.

The pillar is perforated, and 30·96 feet high. It has a mark-stone on the ground floor.

I. Kandání Tower Station, lat. 28° 50′, long. 70° 50′, stands on a tract of open jungle in the Bháwalpúr territory, about 3 miles S. of the town of Paka-Lar. The small village after which the station is named is about 1 mile to the E.

The pillar is perforated, and 25·9 feet high. It has a mark-stone at level of ground floor.

II. Khánbelá Tower Station, lat. 28° 59′, long. 70° 47′, is situated about 1½ miles N. of the town of the same name, in the Bháwalpúr territory.

The pillar is perforated, and 25·9 feet high. It has a mark-stone at level of ground floor.

III. Magrejá Tower Station, lat. 28° 57′, long. 70° 57′, is situated close to a hamlet of the same name, in the Bháwalpúr territory. The town of Allábád is distant about 1½ miles to the W.

The pillar is perforated, and 30·5 feet high. It has a mark-stone at level of ground floor.

IV. Paphrá Tower Station, lat. 29° 6′, long. 70° 52′, is situated about 1½ miles N.N.W. of the village of Miani, in the Bháwalpúr territory.

The pillar is perforated, and 25·0 feet high. It has a mark-stone at level of ground floor.

V. Chanikhán Tower Station, lat. 29° 5′, long. 71° 3′, is situated in the Bháwalpúr territory, on an extensive tract of low jungle. The town of Chanikhán-ki-got lies 0·6 miles to the N.

The pillar is perforated, and 28·5 feet high. It has a mark-stone at level of ground floor.

VI. Sálúkhel Tower Station, lat. 29° 13′, long. 71° 0′, is situated about ¼ of a mile W. of a hamlet of that name, in kardari Jhalari, near Utch, of the Bháwalpúr territory. The village of Jhalari lies about 2 miles S.S.E. of the station.

The pillar is perforated, and 26·1 feet high. It has a mark-stone at level of ground floor.

VII. Pirhár Tower Station, lat. 29° 11′, long. 71° 10′, stands on one of a number of sand hills in the neighbourhood of the village of that name; kardari Gospúr, of the Bháwalpúr territory. The adjacent villages are,—Pirhár, about ¼ of a mile S.S.W., and Dhingana, about 1 mile W.S.W.

The pillar is perforated, and 12·2 feet high. It has a mark-stone at level of ground floor.

VIII. Nandlál Tower Station, lat. 29° 19′, long. 71° 9′, is situated in the Bháwalpúr territory, and stands on the low cultivated lands adjoining the Panjnad river. The adjacent places are,—the town of Khairpúr, about 3 miles to the N.E., and the village of Nandlál, 1·2 miles to the S.S.E.

The pillar is perforated, and 29·0 feet high. It has a mark-stone at level of ground floor.

IX. Núrkanch Tower Station, lat. 29° 14′, long. 71° 19′, is situated in the Bháwalpúr territory, on a level tract of low jungle, to the north of the town of Ahmadpúr. The station derives its name from a few huts to the S.W. The adjacent villages, with their distances and bearings, are,—Malkána, 2½ miles W.N.W., and Pirwa, about the same distance to the E.

The pillar is perforated, and 29·6 feet high. It has a mark-stone at level of ground floor.

X. Hatejí Tower Station, lat. 29° 22′, long. 71° 20′, stands on a cleared spot in an exceedingly dense jungle bordering on the river Sutlej, and takes its name from the village of Hatejí, which lies about 2 miles to the W.S.W. The station is in the Bháwalpúr territory.

The pillar is perforated, and 28·1 feet high. It has a mark-stone at level of ground floor.

XI. Dátekhán Platform Station, lat. 29° 15′, long. 71° 27′, is built on the summit of one of a group of sand hills locally known as Dáte-wálá-tiba, and situated in the Bháwalpúr territory. The village of Mobárakpúr, which contains a small mud fort, is about 0·9 of a mile to the E.

The pillar is solid, and has a mark-stone at its upper surface.

XII. Jhok Tower Station, lat. 29° 25′, long. 71° 32′, stands on the northern bank of the river Sutlej, and within the village of that name, in thana Jelalpúr, tahsil Lodhran, zilla Mooltan.

The pillar is perforated, and 27·8 feet high. It has a mark-stone at level of ground floor.

XIII. Gosain Tower Station, lat. 29° 16′, long. 71° 38′, is built on an artificial mound about 7 feet high, which stands on a sand ridge of considerable height and extent, in the

Bháwalpúr territory. The circumjacent places, with their distances and bearings, are,—the town of Khángah, about 3 miles to the N.W.; the village of Mehruwali, about 2¾ miles to the W.S.W., and the hamlet of Gosain-da-bahi, about 1½ miles to the W.

The pillar is perforated, and 20·5 feet high. It has a mark-stone at level of ground floor.

XIV. Godrí Tower Station, lat. 29° 25′, long. 71° 43′, is situated in the Bháwalpúr territory, and stands on the low cultivated lands which lie between the town of Bháwalpúr and the river Sutlej.

The pillar is perforated, and 34·3 feet high. It has a mark-stone at level of ground floor.

XV. Kabírwálá Tower Station, lat. 29° 17′, long. 71° 50′, is situated in the Bháwalpúr territory, and stands in the desert to the S.E. of the town of Bháwalpúr, and about ½ a mile N.W. of a well from which it takes its name.

The pillar is perforated, and 22·7 feet high. It has a mark-stone at level of ground floor.

XVI. Bakhíderá Tower Station, lat. 29° 27′, long. 71° 54′, is situated on the site of an ancient fort, and stands on one of a group of sand hills which have apparently been used for ages as a burial-ground. The station is in the Bháwalpúr territory; the small town of Bakhíderá, on the river bank, being distant from it about half a mile to the N.

The pillar is perforated, and 14·9 feet high. It has a mark-stone at level of ground floor.

XVII. Ládimsir Tower Station, lat. 29° 22′, long. 72° 2′, stands on the summit of one of a group of sand hills in the desert east of Bháwalpúr. It is in the Bháwalpúr territory. The village from which the station takes its name is distant about ⅔ of a mile to the N.E.

The pillar is perforated, and 10·1 feet high. It has a mark-stone at level of ground floor.

XVIII. Gaddan Platform Station, lat. 29° 29′, long. 72° 4′, is situated in the Bháwalpúr territory, and stands on a high sand ridge overlooking the low cultivated lands in the vicinity of the river Sutlej. The village of Shah Mahomed-ki-got is about ¾ of a mile to the N.E.

The pillar is solid, and has a mark-stone at its upper surface.

XIX. Kaimsir Tower Station, lat. 29° 25′, long. 72° 11′, is situated in the Bháwalpúr territory, and stands in the desert about 7 miles S. of the village of Asrani. There is a well about 1¼ miles to the N.

The pillar is perforated, and 10·8 feet high. It has a mark-stone at level of ground floor.

XX. Támiwálí Platform Station, lat. 29° 34′, long. 72° 15′, is situated in the Bháwalpúr territory, and stands on a high mound forming part of the coast line of the desert. The town of Khairpúr is distant about 1¼ miles to the E.

The pillar is solid, and has a mark-stone at its upper surface.

XXI. Kandá Tower Station, lat. 29° 28′, long. 72° 22′, is situated in the Bháwalpúr

territory, and stands in the desert about 10 miles S.E. of the town of Khairpúr. There is a well about 2 miles to the W.

The pillar is perforated, and 20·4 feet high. It has a mark-stone at level of ground floor.

XXII. Shekhwahán Tower Station, lat. 29° 38′, long. 72° 24′, is built on the summit of a small sand hill situated about a mile S.W. of the village of that name, in kardari Got-Kaim-Rais, of the Bháwalpúr territory. The town of Got-Kaim-Rais is distant about 5 miles to the N.E.

The pillar is perforated, and 15·4 feet high. It has a mark-stone at level of ground floor.

XXIII. Nathal Tower Station, lat. 29° 32′, long. 72° 32′, is situated in the Bháwalpúr territory, and stands in the desert about 11 miles S.S.E. of the town of Got-Kaim-Rais, and about the same distance S.E. of Shekhwahán.

The pillar is perforated, and 21·7 feet high. It has a mark-stone at level of ground floor.

XXIV. Ghallú Tower Station, lat. 29° 41′, long. 72° 33′, is situated in the Bháwalpúr territory, and is built on the borders of the desert. The well from which the station takes its name is distant about a mile, and the town of Hasilpúr about 3 miles to the E.N.E.

The pillar is perforated, and 20·3 feet high. It has a mark-stone at level of ground floor.

XXV. Berwálá Tower Station, lat. 29° 36′, long. 72° 42′, is situated in the Bháwalpúr territory, and stands in the desert, at a distance of about 11 miles S.S.E. of the town of Hasilpúr.

The pillar is perforated, and 15·1 feet high. It has a mark-stone at level of ground floor.

XXVI. Jíwan Tower Station, lat. 29° 46′, long. 72° 43′, is situated in the Bháwalpúr territory, on an open tract of partly cultivated country lying between the desert and the cultivated lowlands adjoining the river Sutlej. The town of Hasilpúr lies about 7 miles to the W.S.W.

The pillar is perforated, and 25·4 feet high. It has a mark-stone at level of ground floor.

XXVII. Arain Tower Station, lat. 29° 41′, long. 72° 53′, is situated in the Bháwalpúr territory, and stands in the desert at a distance of about 5 miles S.E. of the town of Mobárakpúr.

The pillar is perforated, and 25·7 feet high. It has a mark-stone at level of ground floor.

XXVIII. Josar Tower Station, lat. 29° 51′, long. 72° 53′, is situated in the Bháwalpúr territory, and stands on the edge of the barren tract of country adjoining the desert proper. The large village of Chisti is about 2 miles to the south, and that of Mata Jedhu about the same distance to the N.N.W.

The pillar is perforated, and 20·0 feet high. It has a mark-stone at level of ground floor.

XXIX. Fatteh Tower Station, lat. 29° 46′, long. 73° 1′, is situated in the Bháwalpúr territory, and stands in the desert at a distance of about 7 miles S.E. of Mari Shouksha.

The pillar is perforated, and 15·6 feet high. It has a mark-stone at level of ground floor.

XXX. Mandresa Tower Station, lat. 29° 55′, long. 73° 2′, is situated in the Kásimki kardari of the Bháwalpúr territory, and stands on a tract of low thorn jungle skirting the edge of the desert. The hamlet from which the station takes its name is distant about 2 miles to the W.

The pillar is perforated, and 24·8 feet high. It has a mark-stone at level of ground floor.

XXXI. Gajiání Tower Station, is situated in lat. 29° 51′, long. 73° 11′, and in the Bháwalpúr territory. The circumjacent villages, with their approximate distances and bearings, are,—Solona Teba, 3 miles to the N.W.; Kapúranwála, 3 miles to the N.N.E.; Wariamwála, 3½ miles to the N.; and Nursurka, 2½ miles to the W.

The pillar is perforated, and 15·0 feet high. It has a mark-stone at level of ground floor.

XXXII. Bangar Tower Station, lat. 29° 59′, long. 73° 10′, is situated in the Bháwalpúr territory, and is distant about 5 miles to the E.S.E. of the village of Kasimki.

The pillar is perforated, and 25·2 feet high. It has a mark-stone at level of ground floor.

I.—*(Of Jogí-Tílá Meridional Series).* Mámúdeh Tower Station, lat. 29° 55′, long. 73° 21′, is situated in the naibkardari of Chaveka, kardari of Bháwalgarh, state of Bháwalpúr, on a ridge of sand, about two miles south-west of certain cattle-sheds, after which the station is called. There is no village to be seen within a radius of ten miles of the trigonometrical point.

The pillar is perforated; its height above the mark-stone is 14·29 feet.

IV.—*(Of Jogí-Tílá Meridional Series).* Jhúlán Tower Station, lat. 30° 3′, long. 73° 17′, is situated in the thana of Chaveka, kardari of Bháwalgarh, state of Bháwalpúr, about a quarter of a mile to the south of the little village of Jhúlán.

The pillar is perforated; its height above the mark-stone is 20·10 feet.

V.—*(Of Jogí-Tílá Meridional Series).* Dhabbar Tower Station, lat. 30° 3′, long. 73° 39′, is situated in the kardari of Bháwalgarh, state of Bháwalpúr, on a sand hill, about a quarter of a mile south by west of the little village of Dhabbar.

The pillar is perforated; its height above the mark-stone is 23·93 feet.

VIII.—*(Of Jogí-Tílá Meridional Series).* Moní-Dhai Tower Station, lat. 30° 13′, long. 73° 43′, is situated in the naibkardari of Ramúka, kardari of Bháwalgarh, state of Bháwalpúr, on somewhat elevated ground, about 3½ miles south by east of the village of Hassanwála, and about 5 miles south by east of the village of Rateka.

The pillar is perforated; its height above the mark-stone is 30·19 feet.

XXXIII. Jhambherá Tower Station, lat. 30° 6′, long. 73° 52′, is situated about 1¼ miles east by north of the little village of that name; naibkardari of Ramúka, kardari Bháwalgarh of the Bháwalpúr territory.

The pillar is perforated, and 23·1 feet high. It has a mark-stone at level of ground floor.

XXXIV. Fategarh Tower Station, lat. 30° 16′, long. 73° 53′, is situated about 2½ miles N.E. of the village and fort of Fategarh or Gaordana, in the naibkardari of Ramuka, kardari Bháwalgarh, of the Bháwalpúr territory.

The pillar is perforated, and 27·0 feet high. It has a mark-stone at level of ground floor.

XXXV. Jhandwálá Tower Station, lat. 30° 13′, long. 74° 3′, stands on a sandy ridge about 1½ miles W. by N. of the little village of that name, in chaoki Arniwála, thana and tahsil Fázilka, district Sirsa.

The pillar is perforated, and 20·2 feet high. It has a mark-stone at level of ground floor.

XXXVI. Karníkherá Tower Station, lat. 30° 22′, long. 74° 1′, is situated about 1½ miles S. by E. of the village of that name, in thana and tahsil Fázilka, district Sirsa. The village of Asufwála is about 2 miles to the N.W.

The pillar is perforated, and 20·3 feet high. It has a mark-stone at level of ground floor.

XXXVII. Katerá Tower Station, lat. 30° 17′, long. 74° 11′, stands on the bank of a tank, distant about 200 yards to the N. of the little village of that name, in chaoki Arniwála, thana and tahsil Fázilka, district Sirsa.

The pillar is perforated, and 25·3 feet high. It has a mark-stone at level of ground floor.

XXXVIII. Dípoláná Tower Station, lat. 30° 28′, long. 74° 9′, stands on the remains of a fort, and is situated in thana and tahsil Fázilka of the Sirsa district. The station is distant about ½ a mile to the S.W. of the Dípoláná cattle-sheds, and about 2½ miles S.E. of the large village of Bihuk.

The pillar is perforated, and 25·8 feet high. It has a mark-stone at level of ground floor.

XXXIX. Bánáwálá Tower Station, lat. 30° 23′, long. 74° 19′, is situated in chaoki Arniwála, thana and tahsil Fázilka, district Sirsa. The village of Bánáwálá is about 1 mile E. by N., and that of Arniwála about 2 miles to the S.W.

The pillar is perforated, and 35·2 feet high. It has a mark-stone at level of ground floor.

XL. Bahamníwálá Tower Station, lat. 30° 32′, long. 74° 17′, is situated about 1½ miles S.E. of the large village of that name, in thana and tahsil Mukatsar, district Ferozpore.

The pillar is perforated, and 34·1 feet high. It has a mark-stone at level of ground floor.

XLI. Bhágsar Tower Station, lat. 30° 26′, long. 74° 26′, is situated in the north-western extremity of the village of that name, in thana and tahsil Mukatsar, district Ferozpore.

The pillar is perforated, and 30·4 feet high. It has a mark-stone at level of ground floor.

XLII. Joáríwálá Tower Station, lat. 30° 36′, long. 74° 27′, is situated rather more than half a mile to the N.W. of the small village of that name, in thana and tahsil of Mukatsar, district Ferozpore.

The pillar is perforated, and 29·2 feet high. It has a mark-stone at level of ground floor.

XLIII. Múkantsingwálá Tower Station, lat. 30° 28′, long. 74° 35′, stands on a mound of sand about 1 mile to the S.E. of the little village of that name, in thana and tahsil Mukatsar, district Ferozpore. The town of Mukatsar is distant about 2 miles to the N.W.

The pillar is perforated, and 25·1 feet high. It has a mark-stone at level of ground floor.

XLIV. Bhangewálá Tower Station, lat. 30° 38′, long. 74° 37′, is situated about half a mile E. by N. of the small village of Bhangewálá, in thana and tahsil Mukatsar, district Ferozpore.

The pillar is perforated, and 30·2 feet high. It has a mark-stone at level of ground floor.

XLV. Khárá Tower Station, lat. 30° 32′, long. 74° 45′, is situated in the territories of the Rájá of Farídkot, and stands on the bank of a tank on the eastern side of the village of Khárá.

The pillar is perforated, and 26·4 feet high. It has a mark-stone at level of ground floor.

XLVI. Farídkot Tower Station, lat. 30° 40′, long. 74° 48′, is situated in the territories of the Rájá of Farídkot, and stands on a sand ridge about 350 yards to the S.W. of the large town of that name.

The pillar is perforated, and 25·7 feet high. It has a mark-stone at level of ground floor.

LXVIII.—*(Of Gurhágarh Meridional Series).* Dhilan Tower Station, lat. 30° 35′, long. 74° 56′, stands on a high mound about 1½ miles N.E. of the village of that name; thana and tahsil Kot-Kupoára in the territory of the Rájá of Farídkot.

The pillar is perforated, and 20·0 feet high. It has a mark-stone at the ground floor.

LXX.—*(Of Gurhágarh Meridional Series).* Tamáláwálá Tower Station, lat. 30° 45′, long. 74° 56′, is built on a small mound, distant ½ a mile S.W. of the village of Gill; thana Ghull, tahsil, pargana and zilla Ferozpore.

The pillar is perforated, and 25·2 feet high. It has a mark-stone at the level of the ground.

NOTE.—Consequent on modern alterations of district and other boundaries, the sites occupied by the stations are now included in civil divisions of territory which differ frequently from the district, pargana or village, recorded in the preceding descriptions of stations: a suitably modified statement of the sub-divisions in question is accordingly given in the following table and is derived chiefly from the annual reports, up to 1874, made by the Civil Officials to whose care the stations have been committed.

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

No.	Local name	District	Pargana &c.	Village	Remarks
LXXXIII		Bháwalpúr	Shewani	Jauharwála	Of the Great Indus Series.
LXXXIV		,,	Nawakot	Lálúwálí	Do.
I		,,	Pakálára	Kandání	*
II		,,	Khánbelá	Rishájí	
III		,,		Magrejá	
IV		,,			
V	†	,,	Sultánwáh	Kotha Chani Muhammad Khán	*
VI		,,	Kárdári Jhalári	Sálúkhel	
VII		,,	Sultánwáh	Kúndí	*
VIII		,,		Nandlál	
IX		,,	Pírwáh	Fakírawálí Jhok	*
X		,,		Hatejí	
XI	Dáte-wálá-tiba	,,			
XII		Multán	Tah. Lodhrán Thá. Jalálpúr Par. Lodhrán	Jhokutira	
XIII		Bháwalpúr			
XIV		,,			
XV		,,			
XVI		,,			
XVII		,,		Ládimsir	
XVIII		,,			
XIX		,,			
XX		,,			
XXI		,,			
XXII		,,	Kárdári Got-Kaim-Rais	Shekhwahán	
XXIII		,,			
XXIV		,,			
XXV		,,			
XXVI	†	,,			
XXVII		,,			
XXVIII		,,			
XXIX		,,			
XXX		,,	Kárdári Kásimki	Mandresa	
XXXI		,,			
XXXII		,,			
I		,,	Kárdári Bháwalgarh Náib-kárdári Chaveka		Of the Jogí Tíla Series.
IV		,,	Kárdári Bháwalgarh Thá. Chaveka		Do.

NOTE.—Tah. stands for Tahsíl, Thá. for Thánah and Par. for Pargana.

* Visited by Mr. C. Lane of the G. T. Survey during the season of 1866-67, put in thorough repair, protected and transferred by him to the charge of local officials.

† No reports received from the Civil Officials in whose districts these stations lie.

No.	Local name	District	Pargana &c.	Village	Remarks
V	†	Bháwalpúr	Kárdári Bháwalgarh		Of the Jogí Tíla Series.
VIII		,,	Kárdári Bháwalgarh		Do.
			Náibkárdári Ramúka		
XXXIII		,,	,, ,,	Jhambhera	
XXXIV		,,	,, ,,		
XXXV	Jhandwála	Sirsa	Fázilka	Jhandwála	
XXXVI	Asafwála	,,	,,	Asafwála	
XXXVII	Kateráwála	,,	,,	Kateráwála	
XXXVIII	Chak Dípolána	,,	,,	Chak Dípolána	
XXXIX	Bánáwála	,,	,,	Bánáwála	
XL	Bammíwála	Fírozpúr	Tah. Mukatser Thá. Mohankey	Bamníwála	
XLI	Bhágsar	,,	Tah. and Thá. Mukatser	Bhágsar	
XLII	Jowaherwála	,,	,,	Jowaherwála	
XLIII	Múkandsingwála	,,	,,	Múkantsíngwála	
XLIV	Baghawala	,,	,,	Bhangewála	
XLV	†	Farídkot		Khára	
XLVI		,,			
LXVIII		,,	Tah. and Thá. Kot-kapúra	Dhilan	Of the Gurhágarh Series.
LXX	Gill	Fírozpúr	Tah. Fírozpúr Thá. Ghal	Gill	Do.

NOTE.—Tah. stands for Tahsíl, Thá. for Thánah and Par. for Pargana.

† No reports received from the Civil Officials in whose districts these stations lie.

February 1874. J. B. N. H.

SUTLEJ SERIES.

PRINCIPAL TRIANGULATION.

TRIANGLES.

No. of triangle	Station	Spherical excess	Corrected plane angle	Distance			No. of triangle	Station	Spherical excess	Corrected plane angle	Distance		
				Log. feet	Feet	Miles					Log. feet	Feet	Miles
		"	° ′ ″						"	° ′ ″			
	LXX	·19	55 27 10·00	4·7122831	51556·5	9·7′4		XLIII	·20	58 40 47·10	4·7403230	54995·0	10·416
1	LXVIII	·19	52 30 20·82	4·6960359	49663·3	9·406	6	XLII	·20	48 55 59·68	4·6860647	48536·1	9·192
	XLVI	·20	72 2 29·18	4·7748439	59544·8	11·277		XLI	·20	72 23 13·22	4·7878738	61358·4	11·621
	LXVIII	·19	55 7 0·51	4·7015696	50300·2	9·527		XLII	·22	61 52 43·69	4·7606829	57634·6	10·916
2	XLVI	·19	67 39 27·62	4·7536949	56714·6	10·741	7	XLI	·22	60 48 57·33	4·7562806	57053·3	10·806
	XLV	·19	57 13 31·87	4·7122831	51556·5	9·764		XL	·21	57 18 18·98	4·7403230	54995·0	10·416
	XLVI	·22	65 43 22·59	4·7782279	60010·6	11·366		XLI	·19	62 49 26·45	4·7425884	55282·6	10·470
3	XLV	·21	64 27 11·26	4·7737575	59396·0	11·249	8	XL	·19	49 8 3·82	4·6720531	46995·2	8·901
	XLIV	·21	49 49 26·15	4·7015696	50300·2	9·527		XXXIX	·19	68 2 29·73	4·7606829	57634·6	10·916
	XLV	·24	64 8 45·61	4·7921302	61962·7	11·735		XL	·20	65 58 2·25	4·7589147	57400·4	10·871
4	XLIV	·24	55 12 50·02	4·7524273	56549·3	10·710	9	XXXIX	·19	52 26 11·64	4·6973923	49818·7	9·435
	XLIII	·24	60 38 24·37	4·7782279	60010·6	11·366		XXXVIII	·20	61 35 46·11	4·7425884	55282·6	10·470
	XLIV	·23	64 30 44·22	4·7878738	61358·4	11·621		XXXIX	·23	69 42 7·45	4·8017976	63357·4	12·000
5	XLIII	·23	49 45 53·12	4·7150926	51891·1	9·828	10	XXXVIII	·22	52 7 1·28	4·7268641	53316·8	10·098
	XLII	·23	65 43 22·66	4·7921302	61962·7	11·735		XXXVII	·23	58 10 51·27	4·7589147	57400·4	10·871

NOTES.—1. The values of the side are given in the same line with the opposite angle.
2. LXVIII and LXX appertain to the Gurhágarh Meridional Series.

No. of triangle	Station	Spherical excess	Corrected plane angle	Distance			No. of triangle	Station	Spherical excess	Corrected plane angle	Distance		
				Log. feet	Feet	Miles					Log. feet	Feet	Miles
		"	° ′ ″						"	° ′ ″			
	XXXVIII	·23	57 4 58·69	4·7579074	57267·4	10·846		I	·21	47 47 53·87	4·6943373	49469·5	9·369
11	XXXVII	·23	54 40 45·78	4·7455610	55662·3	10·542	23	XXXII	·22	63 48 44·78	4·7776092	59925·2	11·349
	XXXVI	·24	68 14 15·53	4·8017976	63357·4	12·000		XXXI	·22	68 23 21·35	4·7929917	62085·7	11·759
	XXXVII	·19	58 27 28·51	4·7175739	52188·4	9·884		XXXII	·18	66 58 0·59	4·7326548	54033·1	10·233
12	XXXVI	·18	52 16 54·81	4·6851969	48439·2	9·174	24	XXXI	·17	55 37 17·52	4·6853610	48457·5	9·178
	XXXV	·19	69 15 36·68	4·7579074	57267·4	10·846		XXX	·17	57 24 41·89	4·6943373	49469·5	9·369
	XXXVI	·20	64 2 9·52	4·7508862	56349·0	10·672		XXXI	·21	56 46 26·82	4·7314064	53877·4	10·204
13	XXXV	·20	59 35 18·47	4·7328078	54051·5	10·237	25	XXX	·21	66 11 56·78	4·7703306	58929·2	11·161
	XXXIV	·20	56 22 32·01	4·7175739	52188·4	9·884		XXIX	·21	57 1 36·40	4·7326548	54033·1	10·233
	XXXV	·27	56 30 26·26	4·7983964	62863·2	11·906		XXX	·19	55 19 24·79	4·6995167	50063·0	9·482
14	XXXIV	·27	75 6 54·70	4·8624301	72850·1	13·797	26	XXIX	·19	62 25 13·61	4·7320597	53958·5	10·219
	XXXIII	·27	48 22 39·04	4·7508862	56349·0	10·672		XXVIII	·19	62 15 21·60	4·7314064	53877·4	10·204
	XXXIV	·24	64 39 20·83	4·7960320	62521·9	11·841		XXIX	·20	70 51 3·80	4·7731184	59308·7	11·233
15	XXXIII	·23	50 1 11·25	4·7243623	53010·6	10·040	27	XXVIII	·19	56 15 57·99	4·7177667	52211·6	9·889
	VIII	·24	65 19 27·92	4·7983964	62863·2	11·906		XXVII	·19	52 52 58·21	4·6995167	50063·0	9·482
	XXXIII	·31	62 14 11·91	4·8417266	69458·7	13·155		XXVIII	·25	63 52 1·53	4·7921952	61972·0	11·737
16	VIII	·31	64 57 56·08	4·8519967	71120·8	13·470	28	XXVII	·24	56 54 24·67	4·7621599	57830·9	10·953
	V	·31	52 47 52·01	4·7960320	62521·9	11·841		XXVI	·24	59 13 33·80	4·7731184	59308·7	11·233
	V	·31	53 29 0·84	4·8044839	63750·6	12·074		XXVII	·27	55 30 25·26	4·7840204	60816·4	11·518
17	VIII	·32	65 23 41·12	4·8580559	72120·0	13·659	29	XXVI	·28	67 22 4·80	4·8331897	68106·7	12·899
	VII	·32	61 7 18·04	4·8417266	69458·7	13·155		XXV	·27	57 7 29·94	4·7921952	61972·0	11·737
	VII	·29	59 24 46·56	4·8179346	65755·9	12·454		XXVI	·24	51 11 23·02	4·7340027	54200·4	10·265
18	V	·28	49 49 20·00	4·7661234	58361·1	11·053	30	XXV	·24	67 50 35·41	4·8090231	64420·4	12·201
	III	·29	70 45 53·44	4·8580559	72120·0	13·659		XXIV	·24	60 58 1·57	4·7840204	60816·4	11·518
	V	·21	48 17 47·28	4·7002111	50143·1	9·497		XXV	·20	56 32 38·89	4·7276083	53408·3	10·115
19	III	·21	53 26 56·75	4·7320177	53953·3	10·218	31	XXIV	·21	65 36 10·35	4·7656579	58298·6	11·041
	II	·21	78 15 15·97	4·8179346	65755·9	12·454		XXIII	·21	57 51 10·76	4·7340027	54200·4	10·265
	II	·20	68 37 9·11	4·7697494	58850·4	11·146		XXIV	·20	62 29 13·35	4·7364982	54512·8	10·324
20	III	·20	58 52 33·72	4·7332163	54102·4	10·247	32	XXIII	·19	57 10 39·74	4·7130836	51651·6	9·782
	I	·20	52 30 17·17	4·7002111	50143·1	9·497		XXII	·19	60 20 6·91	4·7276083	53408·3	10·115
	III	·20	57 13 13·49	4·7253162	53127·1	10·062		XXIII	·23	68 4 13·99	4·7963441	62566·8	11·850
21	I	·20	54 8 9·67	4·7093493	51209·4	9·699	33	XXII	·23	58 0 21·40	4·7574111	57202·0	10·834
	IV	·20	68 38 36·84	4·7697494	58850·4	11·146		XXI	·22	53 55 24·61	4·7364982	54512·8	10·324
	IV	·19	78 30 55·94	4·7929917	62085·7	11·759		XXII	·22	57 51 35·95	4·7500603	56241·9	10·652
22	I	·18	44 29 40·78	4·6473956	44401·3	8·409	34	XXI	·21	51 45 14·74	4·7173742	52164·4	9·880
	XXXII	·18	56 59 23·28	4·7253162	53127·1	10·062		XX	·22	70 23 9·31	4·7963441	62566·8	11·850

No. of triangle	Station	Spherical excess	Corrected plane angle	Distance			No. of triangle	Station	Spherical excess	Corrected plane angle	Distance		
				Log. feet	Feet	Miles					Log. feet	Feet	Miles
		"	° ′ ″						"	° ′ ″			
35	XXI	·25	62 8 14·72	4·7927418	62050·0	11·752	46	X	·21	63 13 9·77	4·7593636	57459·7	10·883
	XX	·25	64 36 22·67	4·8021263	63405·4	12·009		IX	·21	66 14 1·65	4·7701543	58905·3	11·156
	XIX	·25	53 15 22·61	4·7500603	56241·9	10·652		VIII	·20	50 32 48·58	4·6963378	49697·9	9·412
36	XX	·21	41 42 48·11	4·6527133	44948·3	8·513	47	IX	·19	55 51 59·20	4·7040005	50582·5	9·580
	XIX	·21	71 34 5·16	4·8067564	64085·0	12·137		VIII	·18	54 2 11·59	4·6942696	49461·8	9·368
	XVIII	·21	66 43 6·73	4·7927418	62050·0	11·752		VII	·19	70 5 49·21	4·7593636	57459·7	10·883
37	XIX	·16	59 27 3·92	4·6798923	47851·1	9·063	48	VIII	·22	61 0 13·75	4·7687724	58718·2	11·121
	XVIII	·16	66 33 18·92	4·7073701	50976·5	9·655		VII	·22	70 6 16·93	4·8002110	63126·4	11·956
	XVII	·15	53 59 37·16	4·6527133	44948·3	8·513		VI	·22	48 53 29·32	4·7040005	50582·5	9·580
38	XVIII	·17	57 10 26·00	4·6944712	49484·7	9·372	49	VII	·19	56 55 36·87	4·7163147	52037·3	9·856
	XVII	·18	68 28 38·75	4·7386372	54781·9	10·375		VI	·19	52 3 57·21	4·6900055	48978·5	9·276
	XVI	·17	54 20 55·25	4·6798923	47851·1	9·063		V	·19	71 0 25·92	4·7687724	58718·2	11·121
39	XVII	·22	59 14 12·06	4·7681609	58635·5	11·105	50	VI	·22	63 25 46·82	4·7688957	58734·8	11·124
	XVI	·22	74 16 44·70	4·8174651	65684·8	12·440		V	·22	64 9 36·22	4·7716205	59104·5	11·194
	XV	·22	46 29 3·24	4·6944712	49484·7	9·372		IV	·21	52 24 36·96	4·7163147	52037·3	9·856
40	XVI	·25	60 40 55·74	4·7827923	60644·6	11·486	51	V	·23	56 46 20·91	4·7486263	56056·5	10·617
	XV	·25	61 51 22·41	4·7876710	61329·7	11·615		IV	·23	62 0 30·05	4·7721282	59173·6	11·207
	XIV	·24	57 27 41·85	4·7681609	58635·5	11·105		III	·23	61 13 9·04	4·7688957	58734·8	11·124
41	XV	·25	54 14 42·93	4·7612289	57707·1	10·929	52	IV	·19	60 23 22·46	4·7264312	53263·7	10·088
	XIV	·26	67 13 59·74	4·8166991	65569·1	12·418		III	·19	53 24 21·05	4·6918588	49188·0	9·316
	XIII	·25	58 31 17·33	4·7827923	60644·6	11·486		II	·19	66 12 16·49	4·7486263	56056·5	10·617
42	XIV	·24	62 34 57·16	4·7837611	60780·1	11·511	53	III	·23	63 21 19·28	4·7775346	59914·9	11·348
	XIII	·24	59 58 51·65	4·7729545	59286·3	11·228		II	·23	64 1 43·46	4·7800581	60264·0	11·414
	XII	·24	57 26 11·19	4·7612289	57707·1	10·929		I	·22	52 36 57·26	4·7264312	53263·7	10·088
43	XIII	·26	61 47 35·33	4·7935905	62171·4	11·775	54	II	·19	53 32 50·38	4·7013345	50273·0	9·521
	XII	·25	58 43 6·73	4·7802695	60293·4	11·419		I	·19	52 59 38·49	4·6982050	49912·0	9·453
	XI	·25	59 29 17·94	4·7837611	60780·1	11·511		LXXXIII	·19	73 27 31·13	4·7775346	59914·9	11·348
44	XII	·24	50 24 49·31	4·7324641	54008·8	10·229	55	I	·21	66 29 20·15	4·7651200	58226·4	11·028
	XI	·25	67 4 12·83	4·8098498	64543·1	12·224		LXXXIII	·20	61 9 49·68	4·7452638	55624·2	10·535
	X	·24	62 30 57·86	4·7935905	62171·4	11·775		LXXXIV	·20	52 20 50·17	4·7013345	50273·0	9·521
45	XI	·16	59 42 56·10	4·6963378	49697·9	9·412							
	X	·16	50 29 37·38	4·6474258	44404·4	8·410							
	IX	·17	69 47 26·52	4·7324641	54008·8	10·229							

NOTE.—The Stations LXXXIII and LXXXIV appertain to the Great Indus Series.

J. B. N. HENNESSEY.

SUTLEJ SERIES.

PRINCIPAL TRIANGULATION.

LATITUDES, LONGITUDES, AZIMUTHS AND HEIGHTS.

The following table gives, in the first column, the (numerical) names and the co-ordinates of the successive principal stations taken in order from the stations LXVIII and LXX of the Gurhágarh Meridional Series and XLVI, XLV the initial stations of the Series, and thence through the triangulation westwards to the stations LXXXIII and LXXXIV of the Great Indus Series; in the second column the azimuths at the stations in the first to the surrounding stations are given, and in the third the distinguishing numbers of the triangles—pages 9—*H.* and following—which contain the distances between the central and the surrounding stations.

NOTE.—λ stands for Latitude North; L for Longitude East of Greenwich; H for Height of station in feet above mean sea level; *h* for height of the station pillar or tower in feet: H is given to two places of decimals where the height has been determined by spirit leveling; if dertermined trigonometrically, the height is stated only to the nearest foot.

Descriptions of the exact points referred to by spirit leveling will be found in the statement following this form; trigonometrical heights are invariably referred to the upper surface of the pillar. When the pillar is perforated or the tower is hollow, *h* represents the exact height of the upper surface above the mark-stone on the ground level; in all other cases *h* stands for the height of the station above the general ground level.

Station and its co-ordinates	Azimuths of surrounding stations		Reference to triangle containing distance
		° ′ ″	
LXVIII	XLV	72 9 59·64	2
λ 30 34 54·96	XLVI	127 17 0·34	1
L 74 55 38·48	LXX	179 47 21·35	1
H 731			
h 20			
LXX	XLVI	55 14 30·25	1
λ 30 44 44·36	LXVIII	359 47 20·07	1
L 74 55 35·97			
H 729			
h 26			

Station and its co-ordinates	Azimuths of surrounding stations		Reference to triangle containing distance
		° ′ ″	
XLVI	XLV	14 52 28·86	2
λ 30 40 3·87	XLIV	80 35 51·67	3
L 74 47 48·73	LXX	235 10 31·66	1
H 709	LXVIII	307 13 1·05	1
h 26			
XLV	XLIII	66 15 16·38	4
λ 30 32 2·63	XLIV	130 24 2·23	3
L 74 45 21·07	XLVI	194 51 13·69	2
H 708	LXVIII	252 4 45·76	2
h 26			

NOTE.—LXVIII and LXX appertain to the Gurhágarh Meridional Series.

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XLIV	° ′ ″	XLIII	5 32 26·26	4
λ	30 38 27·34	XLII	70 3 10·71	5
L	74 36 37·89	XLVI	260 30 9·63	3
H	673	XLV	310 19 36·00	3
h	30			
XLIII		XLI	77 5 10·85	6
λ	30 28 16·85	XLII	135 45 58·15	5
L	74 35 29·51	XLIV	185 31 51·50	4
H	698	XLV	246 10 16·11	4
h	25			
XLII		XLI	4 37 49·22	6
λ	30 35 31·77	XL	66 30 33·13	7
L	74 27 19·74	XLIV	249 58 26·45	5
H	659	XLIII	315 41 49·34	5
h	29			
XLI		XXXIX	60 58 59·27	8
λ	30 26 29·17	XL	123 48 25·91	7
L	74 26 29·02	XLII	184 37 23·46	6
H	672	XLIII	257 0 36·88	6
h	30			
XL		XXXVIII	58 49 54·55	9
λ	30 31 46·28	XLII	246 25 28·90	7
L	74 17 21·40	XLI	303 43 48·09	7
H	637	XXXIX	352 51 52·09	8
h	34			
XXXIX		XXXVII	50 44 12·32	10
λ	30 22 43·28	XXXVIII	120 26 20·01	9
L	74 18 39·80	XL	172 52 31·83	8
H	659	XLI	240 55 1·76	8
h	35			
XXXVIII		XXXVI	49 33 34·10	11
λ	30 27 30·80	XL	238 45 47·37	9
L	74 9 14·30	XXXIX	300 21 33·68	9
H	628	XXXVII	352 28 35·18	10
h	26			
XXXVII		XXXV	59 21 8·31	12
λ	30 17 9·02	XXXVI	117 48 37·01	11
L	74 10 48·93	XXXVIII	172 29 23·03	10
H	649	XXXIX	230 40 14·52	10
h	25			

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XXXVI	° ′ ″	XXXIV	54 2 49·79	13
λ	30 21 33·14	XXXVIII	229 29 29·32	11
L	74 1 10·71	XXXVII	297 43 45·09	11
H	609	XXXV	350 0 40·08	12
h	20			
XXXV		XXXIII	53 55 46·92	14
λ	30 13 4·35	XXXIV	110 26 13·45	13
L	74 2 53·90	XXXVI	170 1 32·12	12
H	626	XXXVII	239 17 8·99	12
h	20			
XXXIV		XXXIII	5 28 5·09	14
λ	30 16 18·74	VIII	70 7 26·16	15
L	73 52 51·68	XXXVI	233 58 37·90	13
H	595	XXXV	290 21 10·11	13
h	27			
XXXIII		V	73 12 7·10	16
λ	30 5 59·27	VIII	135 26 19·31	15
L	73 51 43·48	XXXIV	185 27 30·79	14
H	630	XXXV	233 50 10·11	14
h	23			
VIII		V	20 20 4·44	16
λ	30 13 19·98	VII	85 43 45·88	17
L	73 43 23·39	XXXIV	250 2 39·89	15
H	593	XXXIII	315 22 8·05	15
h	30			
VII		III	26 9 46·42	18
λ	30 12 32·43	VIII	265 37 41·21	17
L	73 31 18·78	V	326 44 59·57	17
H	538·35			
h	29			
V		II	48 41 37·64	19
λ	30 2 35·16	III	96 59 25·13	18
L	73 38 48·74	VII	146 48 45·41	17
H	610	VIII	200 17 46·56	16
h	24	XXXIII	253 5 38·89	16
IV		XXXII	53 30 39·49	22
λ	30 3 21·90	III	266 21 6·32	21
L	73 16 44·25	I	334 59 43·36	21
H	534			
h	20			

NOTE.—The stations I, II, III, IV, V, VII and VIII are common to Sutlej and Jogí-Tila Meridional Series.

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
III	° ′ ″	I	29 12 43·99	20
λ	30 3 53·80	IV	86 25 57·67	21
L	73 26 25·91	VII	206 7 19·38	18
H	558	V	276 53 13·11	18
h	31	II	330 20 10·07	19
II		I	81 45 21·83	20
λ	29 56 42·38	III	150 22 31·14	19
L	73 31 8·01	V	228 37 47·32	19
H	577			
h	11			
I		XXXI	62 44 15·89	23
λ	29 55 25·19	XXXII	110 32 9·98	22
L	73 20 59·48	IV	155 1 50·93	21
H	569	III	209 10 0·80	20
h	14	II	261 40 18·17	20
XXXII		XXX	61 13 25·63	24
λ	29 59 0·34	IV	233 27 16·39	22
L	73 9 58·30	I	290 26 39·86	22
H	526	XXXI	354 15 24·86	23
h	25			
XXXI		XXIX	61 52 8·17	25
λ	29 50 53·07	XXX	118 38 35·21	24
L	73 10 54·52	XXXII	174 15 52·90	23
H	556	I	242 39 14·46	23
h	15			
XXX		XXIX	4 46 3·68	25
λ	29 55 9·17	XXVIII	60 5 28·66	26
L	73 1 55·60	XXXII	241 9 24·64	24
H	512	XXXI	298 34 6·69	24
h	25			
XXIX		XXVII	51 29 20·60	27
λ	29 46 17·64	XXVIII	122 20 24·60	26
L	73 1 4·79	XXX	184 45 38·40	25
H	551	XXXI	241 47 15·00	25
h	16			
XXVIII		XXVI	62 24 25·78	28
λ	29 50 42·52	XXX	240 1 4·03	26
L	72 53 4·44	XXIX	302 16 25·82	26
H	502	XXVII	358 32 24·00	27
h	20			

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XXVII	° ′ ″	XXV	66 7 42·07	29
λ	29 40 55·57	XXVI	121 38 7·60	28
L	72 53 21·57	XXVIII	178 32 32·51	27
H	529	XXIX	231 25 30·91	27
h	26			
XXVI		XXV	8 55 15·78	29
λ	29 46 16·99	XXIV	60 6 39·04	30
L	72 43 22·82	XXVIII	242 19 36·66	28
H	494	XXVII	301 33 10·70	28
h	25			
XXV		XXIII	64 31 8·11	31
λ	29 36 22·18	XXIV	121 3 47·20	30
L	72 41 35·97	XXVI	188 54 22·86	29
H	513	XXVII	246 1 53·07	29
h	15			
XXIV		XXIII	6 35 37·40	31
λ	29 40 58·76	XXII	69 4 50·95	32
L	72 32 49·56	XXVI	240 1 25·02	30
H	511	XXV	300 59 26·83	30
h	20			
XXIII		XXI	61 20 8·94	33
λ	29 32 13·51	XXII	129 24 23·16	32
L	72 31 40·13	XXIV	186 35 3·09	31
H	494	XXV	244 26 14·06	31
h	22			
XXII		XXI	7 20 49·14	33
λ	29 37 55·87	XX	65 12 25·30	34
L	72 23 42·81	XXIV	249 0 20·41	32
H	464	XXIII	309 20 27·51	32
h	15			
XXI		XIX	73 26 34·58	35
λ	29 27 41·52	XX	135 34 49·55	34
L	72 22 12·29	XXII	187 20 4·50	33
H	478	XXIII	241 15 29·33	33
h	20			
XX		XIX	20 7 32·82	35
λ	29 34 19·01	XVIII	61 50 21·14	36
L	72 14 46·47	XXII	245 8 0·36	34
H	483	XXI	315 31 9·90	34
h	†			

NOTE.—The stations I, II, III, IV, V and VII are common to Sutlej and Jogí-Tíla Meridional Series.

† Not forthcoming.

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XIX	° ′ ″	XVII	69 4 24·52	37
λ	29 24 42·14	XVIII	128 31 28·60	36
L	72 10 45·04	XX	200 5 33·97	35
H	461	XXI	253 20 56·83	35
h	11			
XVIII		XVII	15 1 32·03	37
λ	29 29 19·15	XVI	72 11 58·19	38
L	72 4 7·10	XX	241 45 6·01	36
H	459	XIX	308 28 12·95	36
h	†			
XVII		XV	67 17 31·93	39
λ	29 21 41·58	XVI	126 31 44·21	38
L	72 1 46·89	XVIII	195 0 23·14	37
H	468	XIX	249 0 0·46	37
h	10			
XVI		XV	20 44 48·32	39
λ	29 26 32·99	XIV	81 25 44·31	40
L	71 54 17·11	XVIII	252 7 7·98	38
H	446	XVII	306 28 3·40	38
h	15			
XV		XIII	84 36 47·42	41
λ	29 17 30·05	XIV	138 51 30·61	40
L	71 50 22·51	XVI	200 42 53·27	39
H	421	XVII	247 11 56·73	39
h	23			
XIV		XIII	26 1 49·42	41
λ	29 25 2·00	XII	88 36 46·82	42
L	71 42 51·31	XVI	261 20 7·33	40
H	415	XV	318 47 49·42	40
h	34			
XIII		XI	84 13 1·78	43
λ	29 16 28·55	XII	146 0 37·37	42
L	71 38 5·33	XIV	205 59 29·26	41
H	404·46	XV	264 30 46·84	41
h	20			
XII		XI	24 40 36·06	43
λ	29 24 47·33	X	75 5 25·61	44
L	71 31 41·10	XIV	268 31 17·65	42
H	396	XIII	325 57 29·08	42
h	28			

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XI	° ′ ″	IX	77 51 3·14	45
λ	29 15 27·92	X	137 33 59·40	44
L	71 26 48·03	XII	204 38 12·48	43
H	397·16	XIII	264 7 30·67	43
h	3			
X		IX	8 0 15·28	45
λ	29 22 2·40	VIII	71 13 25·26	46
L	71 19 56·13	XII	254 59 39·64	44
H	379	XI	317 30 37·74	44
h	28			
IX		VII	65 53 35·81	47
λ	29 13 55·15	VIII	121 45 35·20	46
L	71 18 38·02	X	187 59 37·05	45
H	348·89	XI	257 47 3·75	45
h	30			
VIII		VI	56 43 31·05	48
λ	29 18 54·27	X	251 8 16·53	46
L	71 9 26·08	IX	301 41 5·31	46
H	364	VII	355 43 17·08	47
h	29			
VII		V	48 41 43·67	49
λ	29 10 34·87	VI	105 37 20·73	48
L	71 10 8·66	VIII	175 43 37·88	47
H	348·20	IX	245 49 27·29	47
h	12			
VI		IV	41 1 53·81	50
λ	29 13 11·00	VIII	236 38 39·83	48
L	70 59 30·41	VII	285 32 9·37	48
H	352	V	337 36 6·77	49
h	26			
V		III	36 41 58·07	51
λ	29 5 14·61	IV	93 28 19·21	50
L	71 3 13·92	VI	157 37 55·66	49
H	319·59	VII	228 38 21·77	49
h	28			
IV		II	35 46 50·79	52
λ	29 5 49·37	VI	220 58 20·69	50
L	70 52 13·00	V	273 22 57·86	50
H	316·39	III	335 23 28·14	51
h	25			

† Not forthcoming.

Station and its co-ordinates	Azimuths of surrounding stations.		Reference to triangle containing distance
		° ′ ″	
III	I	38 39 54·91	53
λ 28 57 24·70	II	102 1 14·42	52
L 70 56 35·80	IV	155 25 35·66	51
H 306·84	V	216 38 44·93	51
h 31			
II	LXXXIII	39 31 4·51	54
λ 28 59 14·18	IV	215 44 13·57	52
L 70 46 49·13	III	281 56 30·25	52
H 309·71	I	345 58 13·94	53
h 26			
I	LXXXIV	46 30 33·85	55
λ 28 49 38·62	LXXXIII	112 59 54·21	54
L 70 49 32·44	II	165 59 32·89	53
H 300·03	III	218 36 30·37	53
h 26			

Station and its co-ordinates	Azimuths of surrounding stations		Reference to triangle containing distance
		° ′ ″	
LXXXIII	II	219 28 11·65	54
λ 28 52 52·82	I	292 55 42·97	54
L 70 40 51·83	LXXXIV	354 5 32·85	55
H 300·55			
h 25			
LXXXIV	LXXXIII	174 6 5·28	55
λ 28 43 19·36	I	226 26 55·65	55
L 70 41 59·15			
H 296·30			
h 31			

NOTE.—LXXXIII and LXXXIV appertain to Great Indus Series.

DESCRIPTIONS.

When determining the spirit leveled heights given on the preceding pages, the leveling staff stood on the surfaces hereafter described.

VII or *Akbar-da-Búnga Tower Station;* of the Jogi-Tila Meridional Series.
XIII or *Gosain Tower Station;*
} On the mark-stone let into the ground floor of the tower.

XI or *Dátekhán Platform Station;* on the mark-stone let into the upper surface of the pillar.

IX or *Núrkanch Tower Station;*
VII or *Pirhár Tower Station;*
V or *Chanikhán Tower Station;*
IV or *Paphrá Tower Station;*
III or *Magrejá Tower Station;*
II or *Khánbelá Tower Station;*
I or *Kandání Tower Station;*
LXXXIII or *Chuharlár Tower Station;* of the Great Indus Series.
LXXXIV or *Lálúwálí Tower Station;* of the Great Indus Series.
} On the mark-stone let into the ground floor of the tower.

For further particulars of these stations, see descriptions pages 4—G, 3—H *to* 4—H, *and* 15—D.

J. B. N. HENNESSEY.

SUTLEJ SERIES.

SECONDARY TRIANGULATION. TRIANGLES.

PRINCIPAL-AUXILIARY STATIONS AND INTERSECTED POINTS.

Differences between the common sides of two triangles to intersected points are shown by the small figures in the column for "Distance in Feet" between the data of the two triangles; where they are small they have usually been apportioned between the triangles, but where they are large no adjustment has been made, as one or other of the two values must be erroneous.

Stations denoted by Roman Numerals are Principal Stations.
The values of the side are given in the same line with the opposite angle.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used	No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles					Log. feet	Feet	Miles	
		° ′ ″				Inch			° ′ ″				Inch
	LXVIII	56 33 41	4·715904	51988	9·846	36		XLV	65 53 49	4·744060	55470	10·506	36
56	XLV	57 53 9	4·722368	52768	9·994	,,	60	XLIV	15 2 40	4·197930	15774	2·987	,,
	Farídkot Temple		4·753695	56715	10·741			Sarái Manaret No. 2		4·778228	60011	11·366	
	XLV	63 47 34	4·775021	59569	11·282	,,		XLIV	40 10 10	4·610511	40786	7·725	,,
57	XLIV	51 32 17	4·715904	51988	9·846	,,	61	XLIII	61 19 2	4·744060	55470	10·506	,,
	Farídkot Temple		4·778228	60011	11·366			Sarái Minaret No. 2		4·792130	61963	11·735	
	XLIV	40 11 48	4·610727	40806	7·728	,,		XLIV	38 53 21	4·597271	39561	7·493	,,
58	XLIII	61 16 19	4·743844	55443	10·501	,,	62	XLIII	40 37 45	4·613127	41032	7·771	,,
	Sarái Minaret No. 1		4·792130	61963	11·735			Gulábewálá House		4·792130	61963	11·735	
	XLV	65 46 58	4·743844	55443	10·501	,,		XLIV	25 37 23	4·364862	23167	4·388	,,
59	XLIV	15 1 2	4·197334	15752	2·983	,,	63	XLII	49 59 29	4·613127	41032	7·771	,,
	Sarái Minaret No. 1		4·778228	60011	11·366			Gulábewálá House		4·715093	51891	9·828	

LXVIII appertains to Gurhágarh Meridional Series.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XLIV	64 19 37	4·753373	56673	10·733	36
64	XLIII	15 52 28	4·235518	17200	3·257	,,
	Kanaíwálá Tower		4·792130	61963	11·735	
	XLIII	33 53 25	4·540224	34692	6·570	,,
65	XLII	65 37 52	4·753373	56673	10·733	,,
	Kanaíwálá Tower		4·787874	61358	11·621	
	XLIV	60 39 37	4·656703	45363	8·592	,,
66	XLII	25 1 54	4·342784	22018	4·170	,,
	Labáná House		4·715093	51891	9·828	
	XLIII	47 38 48	4·656703	45363	8·592	,,
67	XLII	40 41 29	4·602294	40022	7·580	,,
	Labáná House		4·787874	61358	11·621	
	XLIV	54 50 16	4·734250	54231	10·271	,,
68	XLII	73 41 44	4·803923	63668	12·058	,,
	Mukatsar Gurúdwárá		4·715093	51891	9·828	
	XLII	40 57 39	4·582332	38224	7·239	,,
69	XLI	68 26 50	4·734250	54231	10·271	,,
	Mukatsar Gurúdwárá		4·740323	54995	10·416	
	XLIV	54 14 23	4·728065	53464	10·126	,,
70	XLII	73 47 58	4·801195	63270	11·983	,,
	Mukatsar Temple No. 1		4·715093	51891	9·828	
	XLII	40 51 25	4·578451	37884	7·175	,,
71	XLI	67 24 6	4·728065	53464	10·126	,,
	Mukatsar Temple No. 1		4·740323	54995	10·416	
	XLIV	48 43 33	4·668130	46573	8·821	,,
72	XLII	74 24 32	4·775885	59688	11·304	,,
	Tibbí Sáhib Gurúdwárá		4·715093	51891	9·828	
	XLII	40 14 51	4·554221	35828	6·786	,,
73	XLI	57 7 28	4·668130	46573	8·821	,,
	Tibbí Sáhib Gurúdwárá		4·740323	54995	10·416	
	XLIII	24 5 14	4·301931	20042	3·796	,,
74	XLI	57 10 26	4·615580	41265	7·815	,,
	Maur House		4·686065	48536	9·192	
	XLIII	34 35 33	4·556803	36042	6·826	,,
75	XLII	40 32 34	4·615580	41265	7·815	,,
	Maur House		4·787874	61358	11·621	
	XLIII	30 54 4	4·430449	26943	5·103	36
76	XLI	81 24 37	4·714961	51875	9·825	,,
	Akalgarh House		4·686065	48536	9·192	
	XLIII	27 46 43	4·457851	28698	5·435	,,
77	XLII	57 24 2	4·714961	51875	9·825	,,
	Akalgarh House		4·787874	61358	11·621	
	XLII	40 33 28	4·574914	37576	7·117	,,
78	XLI	67 20 11	4·726956	53328	10·100	,,
	Mukatsar Temple No. 2		4·740323	54995	10·416	
	XLIII	42 5 34	4·726956	53328	10·100	,,
79	XLII	8 22 32	4·064009	11588	2·195	,,
	Mukatsar Temple No. 2		4·787874	61358	11·621	
	XLII	11 31 17	4·131890	13548	2·566	,,
80	XLI	42 38 51	4·662339	45956	8·704	,,
	Balamgarh House		4·740323	54995	10·416	
	XLIII	48 19 20	4·662339	45956	8·704	,,
81	XLII	37 24 43	4·572655	37381	7·080	,,
	Balamgarh House		4·787874	61358	11·621	
	XLIII	46 33 29	4·675479	47367	8·971	,,
82	XLII	63 18 2	4·765534	58282	11·038	,,
	Madersá Temple		4·787874	61358	11·621	
	XLII	47 30 42	4·633356	42989	8·142	,,
83	XL	54 20 35	4·675479	47367	8·971	,,
	Madersá Temple		4·756281	57053	10·806	
	XLII	16 56 54	4·330130	21386	4·050	,,
84	XLI	114 29 37	4·824523	66761	12·644	,,
	Nandgarh House		4·740323	54995	10·416	
	XLII	44 55 50	4·682645	48155	9·120	,,
85	XL	78 16 17	4·824523	66761	12·644	,,
	Nandgarh House		4·756281	57053	10·806	
	XLII	41 59 34	4·631673	42823	8·110	,,
86	XL	74 57 41	4·791088	61814	11·707	,,
	Lakhíwálá Sand Hill		4·756281	57053	10·806	
	XLII	19 53 10	4·327531	21258	4·026	,,
87	XLI	98 28 33	4·791088	61814	11·707	,,
	Lakhíwálá Sand Hill		4·740323	54995	10·416	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
88	XLII	67 40 42	4·818785	65885	12·478	36
	XLI	61 46 22	4·797627	62752	11·885	,,
	Bahamníwálá Fort		4·740323	54995	10·416	
89	XLI	61 52 2	4·779921	60245	11·410	,,
	XXXIX	74 40 5	4·818785	65885	12·478	,,
	Bahamníwálá Fort		4·672053	46995	8·901	
90	XLI	51 12 52	4·684651	48378	9·163	,,
	XL	17 0 32	4·258993	18155	3·438	,,
	Chúng House		4·760683	57635	10·916	
91	XLII	57 12 43	4·684651	48378	9·163	,,
	XL	40 17 47	4·570751	37218	7·049	,,
	Chúng House		4·756281	57053	10·806	
92	XLI	70 30 7	4·817489	65688	12·441	,,
	XL	53 41 54	4·749424	56160	10·636	,,
	Arníwálá Thánah		4·760683	57635	10·916	
93	XL	61 24 12	4·781987	60532	11·464	,,
	XXXVIII	72 19 34	4·817489	65688	12·441	,,
	Arníwálá Thánah		4·697392	49819	9·435	
94	XL	47 13 25	4·686011	48530	9·191	,,
	XXXVIII	83 52 55	4·817829	65740	12·451	,,
	Taliwálá Sand Hill		4·697392	49819	9·435	
95	XXXVIII	29 49 52	4·507404	32167	6·092	,,
	XXXVII	48 38 2	4·686011	48530	9·191	,,
	Taliwálá Sand Hill		4·801798	63357	12·000	
96	XXXIX	104 12 21	4·788656	61469	11·642	,,
	XXXVIII	10 56 12	4·080266	12030	2·278	,,
	Arníwálá House		4·758915	57400	10·871	
97	XXXVIII	41 10 49	4·642807	43935	8·321	,,
	XXXVII	67 6 14	4·788656	61469	11·642	,,
	Arníwálá House		4·801798	63357	12·000	
98	XXXIX	37 9 9	4·597735	39604	7·501	,,
	XXXVIII	23 55 54	4·424891	26601	5·038	,,
	Dhánwálá Custom Chaukí		4·758915	57400	10·871	
99	XXXVIII	28 11 7	4·532097	34048	6·449	,,
	XXXVII	33 19 30	4·597735	39604	7·501	,,
	Dhánwálá Custom Chaukí		4·801798	63357	12·000	
100	XXXIX	45 23 59	4·611596	40888	7·744	36
	XXXVIII	46 17 9	4·618119	41507	7·861	,,
	Patartalá Sand Hill		4·758915	57400	10·871	
101	XXXVIII	62 54 51	4·715485	51938	9·837	,,
	XXXVI	44 29 59	4·611596	40888	7·744	,,
	Patartalá Sand Hill		4·745561	55662	10·542	
102	XXXVIII	22 0 40	4·460146	28850	5·464	,,
	XXXVII	33 22 55	4·626897	42354	8·022	,,
	Begíwálí House		4·801798	63357	12·000	
103	XXXVIII	35 4 19	4·507095	32144	6·088	,,
	XXXVI	49 12 43	4·626897	42354	8·022	,,
	Begíwálí House		4·745561	55662	10·542	
104	XXXVIII	44 58 37	4·658155	45515	8·620	,,
	XXXVII	34 43 46	4·564492	36685	6·948	,,
	Rámpurá House		4·801798	63357	12·000	
105	XXXVII	19 57 0	4·327064	21236	4·022	,,
	XXXVI	46 59 46	4·658155	45515	8·620	,,
	Rámpurá House		4·757907	57267	10·846	
106	XXXVIII	62 47 18	4·751723	56458	10·693	,,
	XXXVII	30 49 39	4·512319	32533	6·161	,,
	Fázilká Bench-Mark		4·801798	63357	12·000	
107	XXXVII	23 51 7	4·371333	23514	4·453	,,
	XXXVI	76 8 35	4·751723	56458	10·693	,,
	Fázilká Bench-Mark		4·757907	57267	10·846	
108	XXXVIII	62 16 22	4·749412	56158	10·636	,,
	XXXVII	30 42 16	4·510473	32395	6·135	,,
	Fázilká Tahsíl		4·801798	63357	12·000	
109	XXXVII	23 58 30	4·372604	23583	4·467	,,
	XXXVI	75 22 31	4·749412	56158	10·636	,,
	Fázilká Tahsíl		4·757907	57267	10·846	
110	XXXVII	25 45 23	4·413641	25920	4·909	,,
	XXXVI	80 29 24	4·769596	58830	11·142	,,
	Fázilká House		4·757907	57267	10·846	
111	XXXVIII	67 21 43	4·769596	58830	11·142	,,
	XXXVII	28 55 23	4·488933	30827	5·838	,,
	Fázilká House		4·801798	63357	12·000	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XXXVII	10 16 6	4·007812	10182	1·928	36
112	XXXV	47 44 5	4·626016	42268	8·005	,,
	Khiuwálá House		4·685197	48439	9·174	
	XXXVII	48 11 23	4·632256	42880	8·121	,,
113	XXXVI	47 17 2	4·626016	42268	8·005	,,
	Khiuwálá House		4·757907	57267	10·846	
	XXXVII	35 24 8	4·522129	33276	6·302	,,
114	XXXVI	50 9 6	4·644432	44099	8·352	,,
	Sathirwálá House		4·757907	57267	10·846	
	XXXVII	23 3 21	4·278204	18976	3·594	,,
115	XXXV	65 31 22	4·644432	44099	8·352	,,
	Sathirwálá House		4·685197	48439	9·174	
	XXXVII	59 6 1	4·768983	58747	11·126	,,
116	XXXV	75 52 0	4·822112	66391	12·574	,,
	Asafwálá House		4·685197	48439	9·174	
	XXXV	52 58 55	4·710828	51384	9·732	,,
117	XXXIV	65 54 9	4·768983	58747	11·126	,,
	Asafwálá House		4·750886	56349	10·672	
	XXXVI	65 29 42	4·817922	65754	12·453	,,
118	XXXV	68 16 7	4·826900	67127	12·714	,,
	Fathigarh Fort		4·717574	52188	9·884	
	XXXV	47 49 38	4·752491	56558	10·712	,,
119	XXXIII	59 30 1	4·817922	65754	12·453	,,
	Fathigarh Fort		4·862430	72850	13·797	
	XXXVI	42 7 48	4·633390	42992	8·142	,,
120	XXXIV	80 22 18	4·800626	63187	11·967	,,
	Jhajjal Tower		4·732808	54052	10·237	
	XXXIV	51 7 9	4·690758	49063	9·292	,,
121	XXXIII	43 0 36	4·633390	42992	8·142	,,
	Jhajjal Tower		4·798396	62863	11·906	
	XXXIV	63 10 12	4·730405	53753	10·181	,,
122	VIII	55 11 7	4·694215	49455	9·367	,,
	Jhambherá Refg. Mark		4·724362	53011	10·040	
	XXXIII	44 33 48	4·730405	53753	10·181	,,
123	VIII	10 8 21	4·129866	13485	2·554	,,
	Jhambherá Refg. Mark		4·796032	62522	11·841	
	V	43 42 10	4·667342	46488	8·805	36
124	III	58 32 2	4·758839	57390	10·869	,,
	Bháwalgarh Fort		4·817935	65756	12·454	
	I	42 30 4	4·569976	37151	7·036	,,
125	IV	62 27 17	4·688033	48757	9·234	,,
	Mosque No. 1		4·725316	53127	10·062	
	IV	19 39 39	4·253629	17932	3·396	,,
126	XXXII	36 45 22	4·503705	31894	6·040	,,
	Khái Mosque		4·647396	44401	8·409	
	XXXII	120 31 28	4·825829	66962	12·682	,,
127	XXXI	19 57 10	4·423684	26527	5·024	,,
	Kásimká House		4·694337	49469	9·369	
	XXXII	60 39 24	4·664564	46192	8·748	,,
128	XXXI	50 20 51	4·610648	40799	7·727	,,
	Mandresa Referring Mark		4·694337	49469	9·369	
	XXXII	6 18 37	3·958517	9089	1·721	,,
129	XXX	29 33 46	4·610648	40799	7·727	,,
	Mandresa Referring Mark		4·685361	48458	9·178	
	XXIX	20 35 32	4·297290	19828	3·755	,,
130	XXVIII	42 1 55	4·576879	37747	7·149	,,
	Márishonkshá House		4·699517	50063	9·482	
	XXX	44 21 2	4·576879	37747	7·149	,,
131	XXIX	41 49 42	4·556434	36011	6·820	,,
	Márishonkshá House		4·731406	53877	10·204	
	XXIX	51 20 40	4·624247	42097	7·973	,,
132	XXVII	53 3 45	4·634349	43087	8·160	,,
	Chistí Tomb No. 1		4·717767	52212	9·889	
	XXIX	19 30 24	4·235853	17213	3·260	,,
133	XXVIII	56 42 20	4·634349	43087	8·160	,,
	Chistí Tomb No. 1		4·699517	50063	9·482	
	XXIX	17 19 53	4·183532	15259	2·890	,,
134	XXVIII	60 27 7	4·648955	44561	8·440	,,
	Chistí Tomb No. 2		4·699517	50063	9·482	
	XXVIII	38 6 28	4·598778	39699	7·519	,,
135	XXVII	29 6 40	4·495479	31295	5·927	,,
	Mubárikpúr Fort		4·773118	59309	11·233	

I, III, IV, V and VIII are common to Sutlej and Jogí-Tilá Series.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XXVII	27 47 45	4·513437	32616	6·177	36
136	XXVI	34 34 54	4·598778	39699	7·519	,,
	Mubárikpúr Fort		4·792195	61972	11·737	
	XXVIII	8 26 12	4·518757	33018	6·253	,,
137	XXVI	6 27 13	4·403041	25295	4·791	,,
	Shahr Farid House		4·762160	57831	10·953	
	XXVI	3 27 39	4·276851	18917	3·583	,,
138	XXIV	8 24 8	4·660770	45790	8·672	,,
	Hásilpúr House		4·809023	64420	12·201	
	XXIV	3 14 42	3·742719	5530	1·047	,,
139	XXII	28 40 26	4·670941	46875	8·878	,,
	Shekhwahán Tomb		4·713084	51652	9·782	
	XXIV	22 1 2	4·446806	27977	5·299	,,
140	XXII	21 46 49	4·442338	27691	5·244	,,
	Got Káim Raís Fort		4·713084	51652	9·782	
	XXII	2 23 29	4·094965	12444	2·357	,,
141	XX	7 40 55	4·600610	39867	7·551	,,
	Khairpúr No. 1 s.		4·717374	52164	9·880	
	XX	7 13 45	3·194885	1566	0·297	,,
142	Khairpúr No. 1 s.	81 29 45	4·090271	12310	2·332	7
	Khairpúr Bench-Mark		4·094965	12444	2·357	
	XX	33 30 2	4·598969	39716	7·522	36
143	XIX	26 4 39	4·500118	31631	5·991	,,
	Asráni House		4·792742	62050	11·752	
	XIV	0 12 7	4·635098	43162	8·175	,,
144	XIII	0 4 5	4·162730	14546	2·755	,,
	Bháwalpúr Bench-Mark		4·761229	57707	10·929	
	XIII	47 56 50	4·686632	48600	9·204	,,
145	XI	19 9 14	4·331934	21475	4·067	,,
	Khángáh House		4·780270	60293	11·419	
	IX	62 28 41	4·651717	44845	8·493	,,
146	VII	39 31 40	4·507641	32184	6·095	,,
	Ahmadpúr Mosque		4·694270	49462	9·368	
	XI	30 16 58	4·507641	32184	6·095	,,
147	IX	105 37 52	4·788613	61463	11·641	,,
	Ahmadpúr Mosque		4·647426	44404	8·410	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	IX	1 51 34	4·642996	43954	8·325	36
148	VIII	0 34 18	4·130825	13515	2·560	,,
	Malkáná House		4·759364	57460	10·883	
	VII	3 38 6	3·542493	3487	0·660	,,
149	V	59 17 35	4·674796	47293	8·957	,,
	Chanikhán-ká-got s.		4·690006	48979	9·276	
	V	101 56 24	4·238671	17325	3·281	,,
150	Chanikhán-ká-got s.	66 42 8	4·211232	16264	3·080	7
	Chanikhán Bench-Mark		3·542493	3487	0·660	
	IV	31 34 39	4·540469	34711	6·574	36
151	III	26 9 58	4·465840	29231	5·536	,,
	Jánpúr House		4·748626	56057	10·617	
	III	23 56 0	4·665702	46313	8·771	,,
152	II	3 52 40	3·887654	7721	1·462	,,
	Allábád House		4·726431	53264	10·088	
	I	50 47 8	4·636033	43255	8·192	,,
153	LXXXIII	64 59 27	4·704095	50594	9·582	,,
	Khánbelá Tomb		4·701335	50273	9·521	
	II	41 46 46	4·636033	43255	8·192	,,
154	LXXXIII	8 28 4	3·980450	9560	1·811	,,
	Khánbelá Tomb		4·698205	49912	9·453	

FEROZPUR *

SECONDARY SERIES.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	LXVIII	51 8 5	4·690048	48983	9·277	12
155	LXX	57 41 27	4·725668	53170	10·070	,,
	Farídkot s.	71 10 28	4·774844	59545	11·277	,,
	LXX	41 26 47	4·615662	41273	7·817	,,
156	Farídkot s.	86 46 45	4·794171	62254	11·791	,,
	Kot Kapúrá ,,	51 46 28	4·690048	48983	9·277	,,
	Kot Kapúrá s.	41 37 10	4·438303	27435	5·196	,,
157	Farídkot ,,	46 3 50	4·473418	29745	5·634	,,
	Dhímáwálá ,,	92 19 0	4·615662	41273	7·817	,,

NOTE.—LXXXIII appertains to the Great Indus Series, and LXVIII, LXX to the Gurhágarh Meridional Series. * The continuation of this series will be found in the Synopsis of Results of the Gurhágarh Meridional Series.

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles	
			° ′ ″				Inch
158	Dhímáwálá	s.	76 52 18	4·470848	29570	5·600	7
	Farídkot	,,	38 29 58	4·276494	18901	3·580	,,
	Sangú	,,	64 37 44	4·438303	27435	5·196	,,
159	Sangú	s.	95 16 17	4·599625	39776	7·533	,,
	Farídkot	,,	36 58 31	4·380680	24026	4·550	,,
	Sher Singwálá	,,	47 45 12	4·470848	29570	5·600	,,
160	Sher Singwálá	s.	35 4 39	4·461353	28930	5·479	,,
	Farídkot	,,	17 7 14	4·170837	14820	2·807	,,
	Barí Machákí	,,	127 48 7	4·599625	39776	7·533	,,
161	Farídkot	s.	37 10 14	4·244733	17568	3·327	,,
	Barí Machákí	,,	58 36 1	4·394790	24819	4·701	,,
	Rainawálá	,,	84 13 45	4·461353	28930	5·479	,,
162	Barí Machákí	s.	47 11 58	4·276029	18881	3·576	,,
	Rainawálá	,,	89 44 41	4·410492	25733	4·874	,,
	Bágúwálá	,,	43 3 21	4·244733	17568	3·327	,,
163	Rainawálá	s.	45 0 36	4·209730	16208	3·070	,,
	Bágúwálá	,,	79 30 57	4·352858	22535	4·268	,,
	Golehwálá	,,	55 28 27	4·276029	18881	3·576	,,
164	Bágúwálá	s.	64 20 48	4·362856	23060	4·367	,,
	Golehwálá	,,	76 20 17	4·395459	24857	4·708	,,
	Tuthe	,,	39 18 55	4·209730	16208	3·070	,,
165	Golehwálá	s.	70 57 23	4·396860	24938	4·723	,,
	Tuthe	,,	48 6 26	4·293108	19638	3·719	,,
	Bhángar	,,	60 56 11	4·362856	23060	4·367	,,
166	Tuthe	s.	47 10 40	4·273489	18771	3·555	,,
	Bhángar	,,	29 50 17	4·104946	12733	2·412	,,
	Kásúwálá	,,	102 59 3	4·396860	24938	4·723	,,
167	Bhángar	s.	57 44 5	4·242919	17495	3·313	,,
	Kásúwálá	,,	57 8 14	4·240027	17379	3·291	,,
	Piáráná	,,	65 7 41	4·273489	18771	3·555	,,
168	Kásúwálá	s.	46 34 9	4·141802	13861	2·625	,,
	Piáráná	,,	66 59 52	4·244762	17570	3·328	,,
	Malwal	,,	66 25 59	4·242919	17495	3·313	,,
169	Piáráná	s.	68 11 38	4·308027	20325	3·849	12
	Malwal	,,	72 31 14	4·319739	20880	3·955	,,
	Walhúr	,,	39 17 8	4·141802	13861	2·625	,,
170	Malwal	s.	53 8 53	4·217463	16499	3·125	12
	Walhúr	,,	46 32 40	4·175153	14968	2·835	,,
	Sháhdínwálá	,,	80 18 27	4·308027	20325	3·849	,,
171	Malwal	s.	69 59 10	4·306026	20231	3·832	,,
	Sháhdínwálá	,,	65 58 31	4·293726	19666	3·725	,,
	Ferozpúr No. 2	,,	44 2 19	4·175153	14968	2·835	,,
172	Sháhdínwálá	s.	43 6 40	4·191011	15524	2·940	,,
	Ferozpúr No. 2	,,	73 56 8	4·339027	21829	4·134	,,
	Ferozpúr No. 1	,,	62 57 12	4·306026	20231	3·832	,,
173	LXX		52 22 15	4·589306	38842	7·357	,,
	Farídkot	s.	40 29 48	4·503107	31850	6·032	,,
	Bhágthalá	,,	87 7 57	4·690048	48983	9·277	,,
174	LXX		64 45 9	4·647317	44393	8·408	,,
	Farídkot	s.	28 52 45	4·374836	23705	4·490	,,
	Kabar Buchá House			4·690048	48983	9·277	
175	Farídkot	s.	11 37 3	4·003153	10073	1·908	,,
	Bhágthalá	,,	117 26 16	4·647317	44393	8·408	,,
	Kabar Buchá House			4·589306	38842	7·357	
176	Dhímáwálá	s.	67 13 32	4·432136	27048	5·123	,,
	Farídkot	,,	43 30 37	4·305283	20197	3·825	,,
	Sindhú House			4·438303	27435	5·196	
177	Kot Kapúrá	s.	36 47 10	4·305283	20197	3·825	,,
	Dhímáwálá	,,	25 5 28	4·155406	14302	2·709	,,
	Sindhú House			4·473418	29745	5·634	
178	Piáráná	s.	37 25 55	4·108166	12828	2·430	,,
	Walhúr	,,	44 11 47	4·167699	14713	2·787	,,
	Saiyidwálá House			4·319739	20880	3·955	
179	Piáráná	s.	30 45 43	3·882140	7623	1·444	,,
	Malwal	,,	80 48 11	4·167699	14713	2·787	,,
	Saiyidwálá House			4·141802	13861	2·625	
180	Malwal	s.	49 20 13	4·267352	18508	3·505	,,
	Sháhdínwálá	,,	92 49 22	4·386838	24369	4·615	,,
	Ferozpúr Cotton Press	s.		4·175153	14968	2·835	
181	Sháhdínwálá	s.	26 50 51	3·961339	9148	1·733	,,
	Ferozpúr No. 2	,,	66 0 56	4·267352	18508	3·505	,,
	Ferozpúr Cotton Press	s.		4·306026	20231	3·832	

Note.—LXX appertains to the Gurhágarh Meridional Series.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
182	Sháhdínwálá s.	43 24 17	4·190957	15522	2·940	12
	Ferozpúr No. 1 „	61 30 29	4·297838	19854	3·760	„
	Ferozpúr Gun Foundry No. 1		4·339027	21829	4·134	
183	Malwal s.	69 25 25	4·297838	19854	3·760	„
	Sháhdínwálá „	65 40 54	4·286115	19325	3·660	„
	Ferozpúr Gun Foundry No. 1		4·175153	14968	2·835	
184	Malwal s.	56 49 33	4·244052	17541	3·322	„
	Ferozpúr No. 2 „	53 23 1	4·225845	16821	3·186	„
	Núrpúr „	69 47 26	4·293726	19666	3·725	„
185	Malwal s.	3 39 26	3·183818	1527	0·289	„
	Ferozpúr No. 2 „	121 6 4	4·311688	20497	3·882	„
	Ferozpúr Church		4·293726	19666	3·725	
186	Malwal s.	53 10 7	4·230977	17021	3·224	„
	Núrpúr „	74 33 8	4·311688	20497	3·882	„
	Ferozpúr Church		4·225845	16821	3·186	
187	Sháhdínwálá s.	16 39 25	3·851316	7101	1·345	„
	Ferozpúr No. 1 „	101 33 43	4·385075	24270	4·597	„
	Ferozpúr Lightg. Condr. No. 1		4·339027	21829	4·134	
188	Sháhdínwálá s.	26 27 15	4·038032	10915	2·067	„
	Ferozpúr No. 2 „	97 53 9	4·385075	24270	4·597	„
	Ferozpúr Lightg. Condr. No. 1		4·306026	20231	3·832	
189	Sháhdínwálá s.	26 24 38	4·038215	10920	2·068	„
	Ferozpúr No. 2 „	98 5 34	4·385704	24305	4·603	„
	Ferozpúr Lightg. Condr. No. 2		4·306026	20231	3·832	
190	Sháhdínwálá s.	16 42 2	3·853327	7134	1·351	„
	Ferozpúr No. 1 „	101 44 25	4·385704	24305	4·603	„
	Ferozpúr Lightg. Condr. No. 2		4·339027	21829	4·134	
191	Sháhdínwálá s.	46 9 1	4·215946	16442	3·114	„
	Ferozpúr No. 1 „	60 37 32	4·298149	19868	3·763	„
	Ferozpúr Gun Foundry No. 2		4·339027	21829	4·134	
192	Sháhdínwálá s.	34 40 13	4·218934	16555	3·135	„
	Núrpúr „	43 3 11	4·298149	19868	3·763	„
	Ferozpúr Gun Foundry No. 2		*4·453887	28437	5·386	

AHMADWALA TO DHIMAWALA†

SECONDARY SERIES.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
193	Kot Kapúrá s.	37 42 22	4·400810	25166	4·766	12
	Dhímáwálá „	95 59 55	4·611950	40921	7·750	„
	Khárá „	46 17 43	4·473418	29745	5·634	„
194	Dhímáwálá s.	50 19 19	4·288182	19417	3·677	„
	Khárá „	43 43 17	4·241466	17437	3·302	„
	Jhandá Phidá „	85 57 24	4·400810	25166	4·766	„
195	Jhandá Phidá s.	81 38 41	4·364517	23148	4·384	„
	Khárá „	42 15 57	4·196890	15736	2·980	„
	Bájá „	56 5 22	4·288182	19417	3·677	„
196	Bájá s.	66 46 49	4·355461	22670	4·294	„
	Khárá „	43 26 28	4·229487	16962	3·213	„
	Virang „	69 46 43	4·364517	23148	4·384	„
197	Khárá s.	61 13 30	4·329541	21357	4·045	„
	Virang „	50 16 27	4·272770	18740	3·549	„
	Bará Harí „	68 30 3	4·355461	22670	4·294	„
198	Virang s.	60 42 7	4·320150	20900	3·958	„
	Bará Harí „	56 16 48	4·299588	19934	3·775	„
	Bhatiáwálá „	63 1 5	4·329541	21357	4·045	„
199	Bará Harí s.	56 21 23	4·240562	17401	3·296	„
	Bhatiáwálá „	34 18 2	4·071098	11779	2·231	„
	Súrewálá „	89 20 35	4·320150	20900	3·958	„
200	Bhatiáwálá s.	67 12 46	4·331123	21435	4·060	„
	Súrewálá „	64 20 0	4·321299	20956	3·969	„
	Kauní „	48 27 14	4·240562	17401	3·296	„
201	Súrewálá s.	63 39 4	4·343498	22055	4·177	„
	Kauní „	55 46 54	4·308591	20351	3·854	„
	Malan „	60 34 2	4·331123	21435	4·060	„
202	Kauní s.	60 43 10	4·437340	27374	5·184	„
	Malan „	74 38 1	4·480896	30262	5·731	„
	Bhuliáná „	44 38 49	4·343498	22055	4·177	7

* Deduced base. † The continuation of this series will be found in the Synopsis of Results of the Gurhágarh Meridional Series.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Kot Kapúrá s.	21 31 14	4·176461	15013	2·843	12
203	Khárá „	69 15 43	4·582899	38274	7·249	„
	Maur Dharmsálá		4·611950	40921	7·750	
	Khárá s.	53 47 22	4·193843	15626	2·959	„
204	Bará Harí „	50 49 22	4·176461	15013	2·843	„
	Maur Dharmsálá		4·272770	18740	3·549	
	Khárá s.	54 16 39	4·196993	15740	2·981	„
205	Bará Harí „	50 34 7	4·175349	14974	2·836	„
	Maur Tomb		4·272770	18740	3·549	
	Kot Kapúrá s.	21 27 53	4·175349	14974	2·836	„
206	Khárá „	68 46 26	4·581443	38146	7·225	„
	Maur Tomb		4·611950	40921	7·750	
	Bájá s.	41 8 33	4·182761	15232	2·885	„
207	Khárá „	47 53 27	4·234906	17175	3·253	„
	Sarái Flag		4·364517	23148	4·384	
	Bájá s.	25 38 16	3·879497	7577	1·435	„
208	Virang „	78 45 6	4·234906	17175	3·253	„
	Sarái Flag		4·229487	16962	3·213	
	Bará Harí s.	62 55 35	4·223251	16721	3 167	„
209	Súrewálá „	78 13 33	4·264420	18383	3·482	„
	Bhatiáwálá House		4·071098	11779	2·231	
	Khárá s.	30 33 54	4·264420	18383	3·482	„
210	Bará Harí „	118 12 39	4·503197	31856	6·033	„
	Bhatiáwálá House		4·272770	18740	3·549	
	Súrewálá s.	67 22 38	4·317122	20755	3·931	„
211	Malan „	47 47 8	4·221497	16653	3·154	„
	Madank Tower		4·308591	20351	3·854	
	Bará Harí s.	64 52 56	4·221497	16653	3·154	„
212	Súrewálá „	75 17 43	4·250177	17790	3·369	„
	Madank Tower		4·071098	11779	2·231	
	Bhatiáwálá s.	62 45 46	4·320561	20920	3·962	„
213	Kauní „	54 17 4	4·281117	19104	3·618	„
	Bhular „	62 57 10	4·321299	20956	3·969	„
	Malan s.	42 54 9	4·317709	20783	3·936	„
214	Bhuliáná „	20 49 5	4·035438	10850	2·055	7
	Dhúlkot House		4·437340	27374	5·184	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Kauní s.	36 44 5	4·317709	20783	3·936	12
215	Bhuliáná „	23 49 44	4·147315	14038	2·659	7
	Dhúlkot House		4·480896	30262	5·731	

SOUTHERN FLANK

SECONDARY SERIES.

	XLIII	78 34 47	4·722068	52731	9·987	36
216	XLI	36 58 8	4·509902	32352	6·127	„
	Sothá s.	64 27 5	4·686065	48536	9·192	7
	XLI	40 32 48	4·535033	34279	6·492	36
217	Sothá s.	49 46 34	4·604899	40262	7·625	7
	Támkot „	89 40 38	4·722068	52731	9·987	„
	Sothá s.	47 24 46	4·452470	28345	5·368	„
218	Támkot „	69 39 48	4·557495	36099	6·837	„
	Aulak „	62 55 26	4·535033	34279	6·492	„
	Támkot s.	67 28 52	4·498789	31535	5·972	„
219	Aulak „	56 23 20	4·453781	28430	5·385	„
	Alamwálá „	56 7 48	4·452470	28345	5·368	„
	Aulak s.	52 25 21	4·433844	27155	5·143	„
220	Alamwálá „	60 35 52	4·474944	29850	5·653	„
	Malaut „	66 58 47	4·498789	31535	5·972	„
	Alamwálá s.	72 22 52	4·652896	44967	8·517	„
221	Malaut „	72 28 51	4·653135	44992	8·521	„
	Pakí „	35 8 17	4·433844	27155	5·143	„
	Malaut s.	52 19 25	4·567580	36947	6·998	„
222	Pakí „	53 15 3	4·572917	37404	7·084	„
	Kolanwálí „	74 25 32	4·652896	44967	8·517	„
	Pakí s.	98 49 32	4·700940	50227	9·513	„
223	Kolanwálí „	34 32 54	4·459773	28825	5·459	„
	Ráipúr „	46 37 34	4·567580	36947	6·998	„
	Pakí s.	49 30 24	4·550699	35539	6·731	„
224	Ráipúr „	92 24 31	4·669227	46690	8·843	„
	Abohar „	38 5 5	4·459773	28825	5·459	„

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles	
			° ′ ″				Inch
	Ráipúr	s.	53 39 20	4·565951	36809	6·971	7
225	Abohar	,,	75 17 47	4·645441	44202	8·372	,,
	Amarkot	,,	51 2 53	4·550699	35539	6·731	,,
	Abohar	s.	47 17 25	4·629507	42610	8·070	,,
226	Amarkot	,,	93 18 26	4·762614	57891	10·964	,,
	Landá	,,	39 24 9	4·565951	36809	6·971	,,
	Amarkot	s.	39 40 43	4·444633	27838	5·272	,,
227	Landá	,,	62 33 23	4·587636	38693	7·328	,,
	Dhingáwálá	,,	77 45 54	4·629507	42610	8·070	,,
	Landá	s.	99 41 50	4·616709	41372	7·836	,,
228	Dhingáwálá	,,	38 45 18	4·419528	26274	4·976	,,
	Panjává	,,	41 32 52	4·444633	27838	5·272	,,
	Dhingáwálá	s.	40 44 52	4·492401	31074	5·885	,,
229	Panjává	,,	78 54 16	4·669472	46717	8·848	,,
	Usmán Kherá	,,		4·616709	41372	7·836	
	Panjává	s.	63 6 57	4·586215	38567	7·304	,,
230	Usmán Kherá	,,	70 56 30	4·611406	40870	7·741	,,
	XXXIII		45 56 33	4·492401	31074	5·885	36
	Usmán Kherá	s.	68 44 4	4·715512	51941	9·837	7
231	XXXIII		67 28 50	4·711692	51486	9·751	36
	Mirzáwálá	,,	43 47 6	4·586215	38567	7·304	7
	XXXIII		46 59 48	4·717045	52125	9·872	36
232	Mirzáwálá	s.	86 13 22	4·851997	71121	13·470	7
	V		46 46 50	4·715512	51941	9·837	36
	Malaut	s.	67 21 14	4·593326	39204	7·425	7
233	Kolanwálí	,,	50 56 21	4·518300	32984	6·247	,,
	Kingárá	,,	61 42 25	4·572917	37404	7·084	,,
	Malaut	s.	56 8 35	4·492256	31064	5·883	,,
234	Kingárá	,,	62 0 8	4·518896	33029	6·255	,,
	Gúghá	,,	61 51 17	4·518300	32984	6·247	,,
	Kingárá	s.	58 27 17	4·512977	32582	6·171	,,
235	Gúghá	,,	67 12 9	4·547096	35245	6·675	,,
	Gidárvái	,,	54 20 34	4·492256	31064	5·883	,,
	Gúghá	s.	42 45 43	4·427598	26767	5·069	,,
236	Gidárvái	,,	81 30 6	4·590963	38991	7·385	,,
	Kot Bhái	,,	55 44 11	4·512977	32582	6·171	,,

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles	
			° ′ ″				Inch
	XLIII		59 54 38	4·623258	42001	7·955	36
237	XLI		31 0 10	4·397994	25003	4·735	,,
	Rupáná House			4·686065	48536	9·192	
	XLI		46 30 46	4·512158	32521·5	6·159	,,
238	Támkot	s.	69 33 32	4·623258	42001	7·955	7
	Rupáná House			4·604899	40262	7·625	
	XLI		49 0 28	4·562935	36554	6·923	36
239	XXXIX		54 58 5	4·598298	39655	7·510	,,
	Drakhánwálá	s.	76 1 27	4·672053	46995	8·901	7
	XLI		37 26 59	4·409288	25662	4·860	36
240	Támkot	s.	69 59 27	4·598298	39655	7·510	7
	Drakhánwálá	,,	72 33 34	4·604899	40262	7·625	,,
	XLI		15 31 59	4·044821	11087	2·100	36
241	Támkot	s.	60 59 36	4·558811	36209	6·858	7
	Lakhmiráná House			4·604899	40262	7·625	
	XLI		21 55 0	4·170641	14813·1	2·805	36
242	Drakhánwálá	s.	65 50 14	4·558811	36209	6·858	7
	Lakhmiráná House			4·598298	39655	7·510	
	XLI		26 2 11	4·251709	17853	3·381	36
243	Drakhánwálá	s.	51 7 12	4·500540	31662	5·997	7
	Bám House			4·598298	39655	7·510	
	XLI		22 58 17	4·336554	21705	4·111	36
244	XXXIX		34 42 9	4·500540	31662	5·997	,,
	Bám House			4·672053	46995	8·901	
	Gúghá	s.	51 26 4	4·491499	31010	5·873	7
245	Kot Bhái	,,	28 1 39	4·270351	18636	3·530	,,
	Chatrí	,,	100 32 17	4·590963	38991	7·385	,,
	Aulak	s.	42 40 4	4·270351	18636	3·530	,,
246	Gúghá	,,	76 6 47	4·426401	26693	5·056	,,
	Chatrí	,,	61 13 9	*4·382020	24100	4·564	,,
	Aulak	s.	30 39 49	4·214296	16379	3·102	,,
247	Chatrí	,,	25 33 8	4·141542	13853	2·624	,,
	Lúndá House			4·426401	26693	5·056	
	Sothá	s.	19 19 57	4·141542	13853	2·624	,,
248	Aulak	,,	40 17 8	4·432283	27057	5·124	,,
	Lúndá House			4·557495	36099	6·837	

Note.—V is common to Sutle and Jogí-Tíla Series, * Deduced Base.

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles	
			° ′ ″				Inch
249	Aulak	s.	33 3 53	4·235439	17196	3·257	7
	Gúghá	„	16 48 30	3·959731	9114	1·726	„
	Korái House			*4·382020	24100	4·564	
250	Gúghá	s.	55 31 38	4·242875	17493	3·313	„
	Chatrí	„	63 2 32	4·276783	18914	3·582	„
	Vadhan House			4·270351	18636	3·530	
251	Kot Bhái	s.	19 2 15	4·100505	12604	2·387	„
	Chatrí	„	34 20 5	4·338338	21794	4·128	„
	Rukhálá House			4·491499	31010	5·873	
252	Kot Bhái	s.	10 5 0	4·059143	11459	2·170	„
	Chatrí	„	18 11 52	4·310475	20440	3·871	„
	Madír House			4·491499	31010	5·873	
253	Kot Bhái	s.	42 23 28	4·367762	23322	4·417	„
	Chatrí	„	21 18 7	4·099226	12567	2·380	„
	Butrá House			4·491499	31010	5·873	
254	Gidárvái	s.	25 35 59	4·099226	12567	2·380	„
	Kot Bhái	„	41 22 22	4·283832	19223	3·641	„
	Butrá House			4·427598	26767	5·069	
255	Gidárvái	s.	65 19 3	4·388043	24437	4·628	„
	Kot Bhái	„	30 15 7	4·131914	13549	2·566	„
	Hosnár House			4·427598	26767	5·069	
256	Gúghá	s.	31 50 22	4·388043	24437	4·628	„
	Kot Bhái	„	25 29 4	4·299524	19931	3·775	„
	Hosnár House			4·590963	38991	7·385	
257	Gidárvái	s.	90 0 22	4·663378	46066	8·725	„
	Kot Bhái	„	54 28 8	4·573896	37488	7·100	„
	Jhúmbá Tower			4·427598	26767	5·069	
258	Gúghá	s.	57 49 19	4·446720	27972	5·298	„
	Gidárvái	„	22 32 38	4·102788	12670	2·400	„
	Tehrí House			4·512977	32582	6·171	
259	Kingárá	s.	52 6 24	4·446720	27972	5·298	„
	Gidárvái	„	31 47 56	4·271319	18677	3·537	„
	Tehrí House			4·547096	35245	6·675	
260	XLI		28 50 15	4·328399	21301	4·034	36
	Drakhánwálá	s.	87 16 32	4·644566	44113	8·355	7
	Lakarwálá House			4·598298	39655	7·510	
261	Alamwálá	s.	48 5 26	4·328399	21301	4·034	7
	Drakhánwálá	„	48 26 49	4·330808	21419	4·057	„
	Lakarwálá House			*4·453875	28436	5·386	
262	Támkot	s.	126 31 33	4·528116	33738	6·390	„
	Drakhánwálá	„	15 47 44	4·057979	11428	2·164	„
	Dubrí House			4·409288	25662	4·860	
263	Aulak	s.	67 21 53	4·525048	33500	6·345	„
	Alamwálá	„	52 18 48	4·458236	28723	5·440	„
	Támkot House			4·498789	31535	5·972	
264	XXXIX		52 4 49	4·653407	45020	8·527	36
	XXXVII		58 48 43	4·688605	48821	9·246	„
	Ráthá Ther	s.		4·726864	53317	10·098	
265	XXXIX		62 46 17	4·659721	45679	8·651	„
	Drakhánwálá	s.	71 52 2	4·688605	48821	9·246	7
	Ráthá Ther	„		4·562935	36554	6·923	
266	XXXVII		41 16 33	4·530106	33893	6·419	36
	Ráthá Ther	s.	77 31 43	4·700398	50165	9·501	7
	Múláwálá House			4·653407	45020	8·527	
267	Drakhánwálá	s.	47 36 50	4·530106	33893	6·419	„
	Ráthá Ther	„	36 56 26	4·440550	27577	5·223	„
	Múláwálá House			4·659721	45679	8·651	
268	Drakhánwálá	s.	21 34 10	4·498377	31505	5·967	„
	Ráthá Ther	„	10 38 28	4·199332	15825	2·997	„
	Mídhá House			4·659721	45679	8·651	
269	Alamwálá	s.	33 48 8	4·199332	15825	2·997	„
	Drakhánwálá	„	54 49 0	4·366389	23248	4·403	„
	Mídhá House			*4·453875	28436	5·386	
270	Ráipúr	s.	66 41 0	4·551693	35620	6·746	„
	Abohar	„	46 56 7	4·452363	28338	5·367	„
	Ballúwáná House			4·550699	35539	6·731	
271	Pakí	s.	74 59 52	4·452363	28338	5·367	„
	Ráipúr	„	25 43 31	4·104970	12734	2·412	„
	Ballúwáná House			4·459773	28825	5·459	
272	Ráipúr	s.	51 9 54	4·547548	35282	6·682	„
	Amarkot	„	51 26 21	4·549213	35417	6·708	„
	Abohar House			4·645441	44202	8·372	

* Deduced base.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Amarkot s.	92 54 58	4·753478	56686·1	10·736	7
273	Landá „	38 25 58	4·547548	35282	6·682	„
	Abohar House		4·629507	42610	8·070	
	Landá s.	39 27 14	4·248124	17706	3·353	„
274	Dhingáwálá „	53 1 12	4·347501	22259	4·216	„
	Jandwálá House		4·444633	27838	5·272	
	Landá s.	37 51 12	4·264083	18369	3·479	„
275	Panjává „	23 30 58	4·077148	11944	2·262	„
	Díwán Kherá House		4·419528	26274	4·976	
	Panjává s.	102 13 57	4·728848	53561	10·144	„
276	XXXIII	29 32 43	4·431766	27025	5·118	36
	Bakáinwálá House		4·611406	40870	7·741	
	Landá s.	53 58 3	4·431766	27025·3	5·118	7
277	Panjává „	74 11 58	4·507260	32156	6·090	„
	Bakáinwálá House		4·419528	26274	4·976	
	Dhingáwálá s.	52 22 11	4·516488	32846	6·221	„
278	Panjává „	41 39 15	4·440363	27565	5·221	„
	Páníwálá House		4·616709	41372	7·836	
	Panjává s.	37 15 1	4·311407	20484·5	3·879	„
279	Usmán Kherá „	76 4 39	4·516488	32846	6·221	„
	Páníwálá House		4·492401	31074	5·885	
	Panjává s.	73 11 46	4·667478	46503	8·807	„
280	XXXIII	49 31 16	4·567612	36950	6·998	36
	Gamchal House		4·611406	40870	7·741	
	Dhingáwálá s.	50 52 33	4·567612	36950	6·998	7
281	Panjává „	68 49 27	4·647511	44413	8·412	„
	Gamchal House		4·616709	41372	7·836	
	Panjává s.	32 39 0	4·272336	18721	3·546	„
282	Usmán Kherá „	30 55 18	4·251189	17832	3·377	„
	Kamál Kherá House		4·492401	31074	5·885	
	Usmán Kherá s.	91 6 56	4·639358	43587	8·255	„
283	XXXIII	26 40 30	4·291618	19571	3·707	„
	Tútwálá House		4·586215	38567	7·304	
	Panjává s.	91 5 52	4·639358	43587·1	8·255	„
284	XXXIII	19 16 3	4·157924	14385	2·725	„
	Tútwálá House		4·611406	40870	7·741	
	XXXIII	36 23 21	4·579821	38003	7·198	36
285	Mirzáwálá s.	89 25 54	4·806549	64054	12·132	7
	Rámnagar Fort		4·715512	51941	9·837	
	Usmán Kherá s.	47 28 43	4·579821	38003·2	7·198	„
286	Mirzáwálá „	45 38 48	4·566670	36870	6·983	„
	Rámnagar Fort		4·711692	51486	9·751	
	Mirzáwálá s.	70 40 33	4·691982	49202	9·319	„
287	V	20 40 33	4·265040	18409	3·487	36
	Matelí House		4·717045	52125	9·872	
	XXXIII	41 0 35	4·691982	49202·1	9·319	„
288	V	67 27 23	4·840433	69252	13·116	„
	Matelí House		4·851997	71121	13·470	

MIANMIR *

SECONDARY SERIES.

	XLII	43 37 6	4·603963	40176	7·609	„
289	XL	57 57 33	4·693435	49367	9·350	„
	Amír s.	78 25 21	4·756281	57053	10·806	7
	XLII	66 56 52	4·699683	50082	9·485	36
290	Amír s.	47 57 27	4·606608	40421	7·656	7
	Gurú Harsahái „	65 5 41	4·693435	49367	9·350	„
	Amír s.	77 4 36	4·794274	62269	11·793	„
291	Gurú Harsahái „	51 18 12	4·697771	49862	9·444	„
	Mokal „	51 37 12	4·699683	50082	9·485	„
	Gurú Harsahái s.	68 58 10	4·844884	69965	13·251	„
292	Mokal „	54 51 29	4·787430	61296	11·609	„
	Mamdot „	56 10 21	4·794274	62269	11·793	„
	Mokal s.	47 56 18	4·787586	61318	11·613	„
293	Mamdot „	74 9 39	4·900123	79455	15·048	„
	Khúdián „	57 54 3	4·844884	69965	13·251	„
	Mamdot s.	60 50 16	4·753308	56664	10·732	„
294	Khúdián „	48 15 37	4·685014	48419	9·170	„
	Kharepár „	70 54 7	4·787586	61318	11·613	„

NOTE.—V is common to Sutlej and Jogí-Tíla Series. * The continuation of this series will be found in the Synopsis of Results of the Gurhágarh Meridional Series.

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles	
			° ′ ″				Inch
	Kharepár	s.	102 1 28	4·884084	76574	14·503	7
295	Khúdián	,,	31 36 38	4·613169	41036	7·772	,,
	Kasúr	,,	46 21 54	4·753308	56664	10·732	,,
	Khúdián	s.	51 53 1	4·794462	62296	11·799	,,
296	Kasúr	,,	52 51 30	4·800158	63119	11·954	,,
	Tháman	,,	75 15 29	4·884084	76574	14·503	,,
	Gurú Harsahái	s.	54 8 29	4·703779	50557	9·575	,,
297	Mamdot	,,	25 9 38	4·423594	26521	5·023	,,
	Kilá Dípsingwálá	,,	100 41 53	4·787430	61296	11·609	,,
	XLIV		28 23 52	4·423594	26521	5·023	,,
298	Gurú Harsahái	s.	57 23 28	4·671863	46975	8·897	,,
	Kilá Dípsingwálá	,,	94 12 40	*4·745187	55614	10·533	,,
	Mamdot	s.	39 36 37	4·509074	32290	6·116	,,
299	Kilá Dípsingwálá	,,	46 58 30	4·568502	37026	7·012	,,
	Machíwárá	,,	93 24 53	4·703779	50557	9·575	,,
	Kilá Dípsingwálá	s.	52 34 52	4·512667	32559	6·166	,,
300	Machíwárá	,,	75 27 2	4·598574	39680	7·515	,,
	Dod	,,	51 58 6	4·5c9074	32290	6·116	,,
	XLIV		49 46 54	4·598574	39680	7·515	,,
301	Kilá Dípsingwálá	s.	65 32 5	4·674857	47300	8·958	,,
	Dod	,,	64 41 1	4·671863	46975	8·897	,,
	Mamdot	s.	59 39 18	4·664000	46132	8·737	,,
302	Kharepár	,,	55 24 58	4·643546	44009	8·335	,,
	Khái	,,	64 55 44	4·685014	48419	9·170	,,
	Mamdot	s.	44 24 11	4·495484	31296	5·927	,,
303	Machíwárá	,,	79 43 21	4·643546	44009	8·335	,,
	Khái	,,	55 52 28	4·568502	37026	7·012	,,
	XL		35 59 31	4·466769	29293	5·548	36
304	XXXVIII		52 5 49	4·594739	39331	7·449	,,
	Bhambá	s.	91 54 40	4·697392	49819	9·435	7
	XL		42 24 8	4·423727	26529	5·025	36
305	Bhambá	s.	48 55 0	4·472084	29654	5·616	7
	Bagáke	,,	88 40 52	4·594739	39331	7·449	,,
	XL		51 14 23	4·500369	31650	5·994	36
306	Amír	s.	46 56 14	4·472084	29654	5·616	7
	Bagáke	,,	81 49 23	4·603963	40176	7·609	,,
	Amír	s.	61 24 5	4·606735	40433	7·658	7
307	Bagáke	,,	75 11 4	4·648559	44520	8·432	,,
	Dayá Singwálá	,,	43 24 51	4·500369	31650	5·994	,,
	Amír	s.	48 12 17	4·589391	38850	7·358	,,
308	Mokal	,,	58 41 15	4·648559	44520	8·432	,,
	Dayá Singwálá	,,	73 6 28	4·697771	49862	9·444	,,
	Mokal	s.	45 7 32	4·443920	27792	5·264	,,
309	Dayá Singwálá	,,	52 43 47	4·494283	31209	5·911	,,
	Kanganpurá	,,	82 8 41	4·589391	38850	7·358	,,
	Mokal	s.	62 4 47	4·690719	49059	9·291	,,
310	Kanganpurá	,,	83 43 7	4·741849	55189	10·452	,,
	Talwandí	,,	34 12 6	4·494283	31209	5·911	,,
	Mokal	s.	39 41 27	4·708350	51092	9·676	,,
311	Khúdián	,,	43 37 7	4·741849	55189	10·452	,,
	Talwandí	,,	96 41 26	4·900123	79455	15·048	,,
	Kanganpurá	s.	45 41 25	4·558333	36169	6·850	,,
312	Talwandí	,,	58 14 14	4·633218	42975	8·139	,,
	Ghelan	,,	76 4 21	4·690719	49059	9·291	,,
	Khúdián	s.	72 14 36	4·736056	54457	10·314	,,
313	Talwandí	,,	44 26 24	4·602453	40036	7·583	,,
	Dhalle	,,	63 19 0	4·708350	51092	9·676	,,
	Khúdián	,,	54 28 58	4·711682	51485	9·751	,,
314	Tháman	,,	39 16 3	4·602453	40036	7·583	,,
	Dhalle	,,	86 14 59	4·800158	63119	11·954	,,
	Talwandí	s.	76 27 40	4·827975	67294	12·745	,,
315	Dhalle	,,	51 39 19	4·734692	54287	10·282	,,
	Chúnián	,,	51 53 1	4·736056	54457	10·314	,,
	Talwandí	s.	49 58 10	4·618949	41586	7·876	,,
316	Ghelan	,,	88 16 30	4·734692	54287	10·282	,,
	Chúnián	,,	41 45 20	4·558333	36169	6·850	,,
	Kharepár	s.	58 19 19	4·585632	38515	7·295	,,
317	Kasúr	,,	56 37 20	4·577414	37793	7·158	,,
	Bhílá Tomb			4·613169	41036	7·772	
	Khúdián	s.	41 39 59	4·577414	37793	7·158	,,
318	Kharepár	,,	43 42 9	4·594152	39278	7·439	,,
	Bhílá Tomb			4·753308	56664	10·732	

* Deduced Base.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Khúdián s.	50 55 10	4·776925	59831	11·332	7
319	Kasúr „	32 32 33	4·617639	41461	7·852	„
	Kotlí Madarsá		4·884084	76574	14·503	
	Kasúr s.	20 18 56	4·335950	21675	4·105	„
320	Tháman „	73 24 49	4·776925	59831	11·332	„
	Kotlí Madarsá		4·794462	62296	11·799	
	Kilá Dípsingwálá s.	66 20 59	4·560892	36382	6·891	„
321	Dod „	21 8 23	4·156069	14324	2·713	„
	Ahal House		4·598574	39680	7·515	
	XLIV	50 8 21	4·560892	36382	6·891	„
322	Dod s.	43 32 38	4·513917	32653	6·184	„
	Ahal House		4·674857	47300	8·958	
	XL	23 26 7	4·391481	24631	4·665	36
323	Bhambá s.	117 8 20	4·741254	55113	10·438	7
	Bihak „		4·594739	39331	7·449	
	XXXVIII	56 15 41	4·391481	24631	4·665	36
324	Bhambá s.	25 13 40	4·101209	12624	2·391	7
	Bihak „	98 30 39	4·466769	29293	5·548	„
	XL	26 9 53	4·254780	17980	3·405	36
325	Bhambá s.	48 32 49	4·485158	30560	5·788	7
	Lamochar Flag		4·594739	39331	7·449	
	XL	16 14 15	3·932016	8551	1·620	36
326	Bagáke s.	87 54 13	4·485158	30560	5·788	7
	Lamochar Flag		4·472084	29654	5·616	
	XXXVIII	42 15 22	3·956992	9057	1·715	36
327	Bihak s.		4·096934	12501	2·368	
	Bodlá Núr Sháh „	69 36 6	4·101209	12624	2·391	„
	Dayá Singwálá s.	127 18 46	4·808920	64405	12·198	7
328	Kanganpurá „	32 36 54	4·639950	43647	8·266	„
	Atárí Flag		4·443920	27792	5·264	
	Bagáke s.	61 49 16	4·639950	43647	8·266	„
329	Dayá Singwálá „	63 26 8	4·646286	44288	8·388	„
	Atárí Flag		4·606735	40433	7·658	
	Ghelan s.	83 52 58	4·618305	41525	7·865	„
330	Chúnián „	11 22 57	3·916040	8242	1·561	„
	Thíng House		4·618949	41586	7·876	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Dhalle s.	28 27 47	4·510585	32403	6·137	7
331	Chúnián „	53 20 12	4·736698	54538	10·329	„
	Múlápúr Temple		4·827975	67294	12·745	
	Dhalle s.	61 32 41	4·774853	59546	11·278	„
332	Chúnián „	34 56 56	4·588808	38798	7·348	„
	Gandhí Flag		4·827975	67294	12·745	

KIHROR AND MAILSI

SECONDARY SERIES.

	XX	56 16 25	4·728858	53562	10·144	36
333	XVIII	39 24 13	4·611515	40880	7·742	12
	Chilávahán s.	84 19 22	4·806756	64085	12·137	„
	XX	35 22 6	4·386286	24338	4·609	36
334	Chilávahán s.	68 9 35	4·591387	39029	7·392	12
	Fathipúr „	76 28 19	4·611515	40880	7·742	„
	Chilávahán s.	89 54 46	4·484847	30538	5·784	„
335	Fathipúr „	37 14 46	4·266775	18483	3·501	„
	Bhágú Khán „	52 50 28	4·386286	24338	4·609	„
	Chilávahán s.	72 45 29	4·437870	27408	5·191	„
336	Bhágú Khán „	67 8 44	4·422331	26444	5·008	„
	Masákothá „	40 5 47	4·266775	18483	3·501	„
	Bhágú Khán s.	45 17 49	4·524909	33490	6·343	„
337	Masákothá „	99 8 3	4·667642	46520	8·811	„
	Kihror „	35 34 8	4·437870	27408	5·191	„
	Masákothá s.	53 15 25	4·506863	32126	6·084	„
338	Kihror „	70 5 36	4·576296	37696	7·139	„
	Sháhpúr No. 1 „	56 38 59	4·524909	33490	6·343	„
	Kihror s.	48 20 34	4·435586	27264	5·164	„
339	Sháhpúr No. 1 „	69 58 4	4·535084	34283	6·493	„
	Kharak „	61 41 22	4·506863	32126	6·084	„
	Kihror s.	43 18 42	4·436601	27328	5·176	„
340	Kharak „	77 18 28	4·589554	38865	7·361	„
	Kharal „	59 22 50	4·535084	34283	6·493	„

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
341	Khamak s.	39 9 7	4·286733	19352	3·665	12
	Kharal „	77 46 34	4·476483	29956	5·673	„
	Dhaniot „	63 4 19	4·436601	27328	5·176	„
342	Kharal s.	53 6 29	4·286496	19342	3·663	„
	Dhaniot „	73 44 32	4·365808	23217	4·397	„
	Kamálpúr „	53 8 59	4·286733	19352	3·665	„
343	Dhaniot s.	66 28 8	4·352353	22509	4·263	„
	Kamálpúr „	61 32 49	4·334149	21585	4·088	„
	Rajanpúr „	51 59 3	4·286496	19342	3·663	„
344	Dhaniot s.	58 16 57	4·362641	23048	4·365	„
	Rajanpúr „	68 54 27	4·402772	25280	4·788	„
	Trevit „	52 48 36	4·334149	21585	4·088	„
345	Rajanpúr s.	65 40 55	4·380703	24027	4·551	„
	Trevit „	53 22 24	4·325521	21160	4·008	„
	Lodhran „	60 56 41	4·362641	23048	4·365	„
346	Trevit s.	59 52 16	4·428988	26853	5·086	„
	Lodhran „	69 25 27	4·463395	29067	5·505	„
	Adamvahán „	50 42 17	4·380703	24027	4·551	„
347	Lodhran s.	51 40 55	4·416478	26090	4·941	„
	Adamvahán „	74 27 53	4·505676	32039	6·068	„
	Sand Hill „	53 51 12	4·428988	26853	5·086	„
348	Sand Hill s.	67 5 17	4·386070	24326	4·607	„
	Adamvahán „	31 49 51	4·143912	13929	2·638	„
	Chamb „	81 4 52	4·416478	26090	4·941	„
349	Adamvahán s.	87 58 14	4·488644	30807	5·835	„
	Chamb „	39 55 28	4·296301	19783	3·747	„
	XIV	52 6 18	4·386070	24326	4·607	„
350	Chamb s.	147 11 29	4·772955	59286	11·228	„
	XIV	16 27 21	4·491298	30995	5·870	„
	XII	16 21 10	4·488644	30807	5·835	36
351	Bhágú Khán s.	34 2 48	4·271308	18677	3·537	12
	Fathipúr „	79 41 12	4·516148	32821	6·216	„
	Jalá „	66 16 0	4·484847	30538	5·784	„
352	Fathipúr s.	50 14 1	4·420745	26348	4·990	„
	Jalá „	96 45 1	4·531990	34040	6·447	„
	Sháhpúr No. 2 „	33 0 58	4·271308	18677	3·537	„
353	Jalá s.	46 20 42	4·372963	23603	4·470	„
	Sháhpúr No. 2 „	79 47 15	4·506583	32106	6·081	„
	Mailsí „	53 52 3	4·420745	26348	4·990	„
354	Sháhpúr No. 2 s.	41 31 44	4·200005	15849	3·002	„
	Mailsí „	57 35 43	4·304982	20183	3·823	„
	Khánpúr „	80 52 33	4·372963	23603	4·470	„
355	Mailsí s.	18 46 45	4·198763	15804	2·993	„
	Khánpúr „	142 23 9	4·476585	29963	5·675	„
	Malúkvahán Mosque		4·200005	15849	3·002	
356	Bhágú Khán s.	67 4 21	4·421782	26411	5·002	„
	Masákothá „	40 2 6	4·265907	18446	3·494	„
	Chilávahán Tomb		4·437870	27408	5·191	
357	Bhágú Khán s.	52 54 51	4·386705	24362 [1]	4·614	„
	Fathipúr „	37 9 33	4·265907	18446	3·494	„
	Chilávahán Tomb		4·484847	30538	5·784	
358	Masákothá s.	51 45 10	4·492774	31101	5·890	„
	Sháhpúr No. 1 „	56 5 36	4·516763	32867	6·225	„
	Kihror Tomb No. 1		4·576296	37696	7·139	
359	Sháhpúr No. 1 s.	70 31 27	4·529435	33840	6·409	„
	Kharak „	60 3 1	4·492774	31101	5·890	„
	Kihror Tomb No. 1		4·435586	27264	5·164	
360	Dhaniot s.	15 22 52	3·851646	7106	1·346	„
	Rajanpúr „	38 17 27	4·220158	16602	3·144	„
	Thattí House		4·334149	21585	4·088	
361	Rajanpúr s.	66 20 37	4·381582	24076	4·560	„
	Trevit „	52 23 18	4·318518	20822	3·944	„
	Lodhran Dome		4·362641	23048	4·365	
362	Trevit s.	60 51 22	4·435466	27256 [2]	5·162	„
	Adamvahán „	50 29 16	4·381582	24076	4·560	„
	Lodhran Dome		4·463395	29067	5·505	
363	Trevit s.	53 4 36	4·283646	19215	3·639	„
	Lodhran „	38 27 40	4·174638	14950	2·831	„
	Sháh Sahálí Tomb		4·380703	24027	4·551	
364	Lodhran s.	30 57 47	4·156285	14331 [1]	2·714	„
	Adamvahán „	43 36 56	4·283646	19215	3·639	„
	Sháh Sahálí Tomb		4·428988	26853	5·086	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Sand Hill s.	49 17 53	4·236381	17234	3·264	12
365	Chamb ,,	92 54 55	4·356085	22703	4·300	,,
	Harí Sháh Tomb No. 1		4·143912	13929	2·638	
	Chamb s.	28 5 25	4·245189	17587	3·331	,,
366	XIV	27 28 41	4·236381	17234	3·264	,,
	Harí Sháh Tomb No. 1		4·488644	30807	5·835	

MULTAN, SHUJA-ABAD AND KHANGARH *

SECONDARY SERIES.

	Sand Hill s.	45 23 44	4·365322	23191	4·392	,,
367	Lodhran ,,	54 59 48	4·426206	26681	5·053	,,
	Gházíwálá Khú ,,	79 36 28	4·505676	32039	6·068	,,
	Lodhran s.	44 34 49	4·213460	16348	3·096	,,
368	Gházíwálá Khú ,,	50 42 57	4·255930	18027	3·414	,,
	Váhíwálá Khú ,,	84 42 14	4·365322	23191	4·392	,,
	Gházíwálá Khú s.	52 14 8	4·115609	13050	2·472	,,
369	Váhíwálá Khú ,,	45 44 46	4·072755	11824	2·239	,,
	Naurangsháh ,,	82 1 6	4·213460	16348	3·096	,,
	Váhíwálá Khú s.	47 28 31	4·018560	10437	1·977	,,
370	Naurangsháh ,,	65 22 27	4·109687	12873	2·438	,,
	Paulíwálá ,,	67 9 2	4·115609	13050	2·472	,,
	Naurangsháh s.	50 12 17	3·966699	9262	1·754	,,
371	Paulíwálá ,,	69 49 21	4·053642	11315	2·143	,,
	Salsadar ,,	59 58 22	4·018560	10437	1·977	,,
	Paulíwálá s.	43 42 13	3·882359	7627	1·445	,,
372	Salsadar ,,	79 15 34	4·035251	10846	2·054	,,
	Pathánwálá ,,	57 2 13	3·966699	9262	1·754	,,
	Salsadar s.	62 52 52	3·995685	9901	1·875	,,
373	Pathánwálá ,,	73 49 59	4·028741	10684	2·024	,,
	Katgarh ,,	43 17 9	3·882359	7627	1·445	,,
	Pathánwálá s.	49 7 16	3·920567	8328	1·577	,,
374	Katgarh ,,	66 52 11	4·005596	10130	1·919	,,
	Miánpúr ,,	64 0 33	3·995685	9901	1·875	,,

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Katgarh s.	62 3 26	3·970983	9354	1·772	12
375	Miánpúr ,,	66 4 29	3·985800	9678	1·833	,,
	Mulá-ká-Váhí ,,	51 52 5	3·920567	8328	1·577	,,
	Miánpúr s.	49 57 2	3·943707	8784	1·664	,,
376	Mulá-ká-Váhí ,,	75 27 5	4·045614	11107	2·104	,,
	Amewálá ,,	54 35 53	3·970983	9354	1·772	,,
	Mulá-ká-Váhí s.	58 21 12	3·957877	9076	1·719	,,
377	Amewálá ,,	66 9 44	3·989070	9751	1·847	,,
	Mocharwálá ,,	55 29 4	3·943707	8784	1·664	,,
	Amewálá s.	54 33 52	3·972951	9396	1·780	,,
378	Mocharwálá ,,	73 31 55	4·043725	11059	2·095	,,
	Párámal ,,	51 54 13	3·957877	9076	1·719	,,
	Mocharwálá s.	57 28 58	4·024784	10587	2·005	,,
379	Párámal ,,	74 4 6	4·081827	12073	2·287	,,
	Dumbáwálá ,,	48 26 56	3·972951	9396	1·780	,,
	Párámal s.	54 2 19	4·023864	10565	2·001	,,
380	Dumbáwálá ,,	71 45 18	4·093292	12396	2·348	,,
	Pípalwálá ,,	54 12 23	4·024784	10587	2·005	,,
	Dumbáwálá s.	59 43 8	3·992706	9833	1·862	,,
381	Pípalwálá ,,	52 11 16	3·954053	8996	1·704	,,
	Dortá ,,	68 5 36	4·023864	10565	2·001	,,
	Dortá s.	64 17 42	4·004656	10108	1·914	,,
382	Pípalwálá ,,	54 28 19	3·960447	9129	1·729	,,
	Lahorí ,,	61 13 59	3·992706	9833	1·862	,,
	Pípalwálá s.	47 20 9	3·873463	7472	1·415	,,
383	Lahorí ,,	36 44 50	3·783885	6080	1·151	,,
	Ukáwálá ,,	95 55 1	4·004656	10108	1·914	,,
	Ukáwálá s.	63 57 10	3·907565	8083	1·531	14
384	Lahorí ,,	59 53 18	3·891120	7783	1·474	,,
	Gelehwálá ,,	56 9 32	3·873463	7472	1·415	,,
	Lahorí s.	50 20 58	3·829019	6746	1·278	,,
385	Gelehwálá ,,	62 20 35	3·889864	7760	1·470	,,
	Marí No. 1 ,,	67 18 27	3·907565	8083	1·531	,,
	Gelehwálá s.	73 49 54	3·919921	8316	1·575	,,
386	Marí No. 1 ,,	54 59 37	3·850778	7092	1·343	,,
	Jhakar ,,	51 10 29	3·829019	6746	1·278	,,

* The continuation of this series will be found in the Synopsis of Results of the Great Indus Series.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
387	Marí No. 1 s.	71 27 40	3·999150	9980	1·890	14
	Jhakar „	56 21 11	3·942660	8763	1·660	„
	Pípalwálá Khú „	52 11 9	3·919921	8316	1·575	„
388	Jhakar s.	44 11 23	3·878352	7557	1·431	„
	Pípalwálá Khú „	68 48 6	4·004668	10108	1·914	„
	Marí No. 2 „	67 0 31	3·999150	9980	1·890	„
389	Pípalwálá Khú s.	61 22 7	3·891616	7791	1·476	„
	Marí No. 2 „	60 16 34	3·886992	7709	1·460	„
	Gandá Dád-kí-bastí „	58 21 19	3·878352	7557	1·431	„
390	Marí No. 2 s.	57 11 22	3·879283	7573	1·434	„
	Gandá Dád-kí-bastí „	62 57 53	3·904507	8026	1·520	„
	Marí-ká-mauza „	59 50 45	3·891616	7791	1·476	„
391	Gandá Dád-kí-bastí s.	57 19 53	3·858797	7224	1·368	„
	Marí-ká-mauza „	60 43 38	3·874251	7486	1·418	„
	Dád-kí-bastí „	61 56 29	3·879283	7573	1·434	„
392	Marí-ká-mauza s.	61 59 35	3·866095	7347	1·391	„
	Dád-kí-bastí „	57 45 34	3·847464	7038	1·333	„
	Mulláwálá Khú „	60 14 51	3·858797	7224	1·368	„
393	Dád-kí-bastí s.	63 35 6	3·878874	7566	1·433	„
	Mulláwálá Khú „	55 59 59	3·845335	7004	1·326	„
	Jhandwálá Khú „	60 24 55	3·866095	7347	1·391	„
394	Mulláwálá Khú s.	59 33 34	3·870559	7423	1·406	„
	Jhandwálá Khú „	58 56 24	3·867766	7375	1·397	„
	Salonoán-kí-Khú „	61 30 2	3·878874	7566	1·433	„
395	Jhandwálá Khú s.	62 46 33	3·878395	7558	1·431	„
	Salonoán-kí-Khú „	56 22 37	3·849872	7077	1·340	„
	Káimwálá Khú „	60 50 50	3·870559	7423	1·406	„
396	Salonoán-kí-Khú s.	67 21 24	3·922969	8375	1·586	„
	Káimwálá Khú „	56 14 46	3·877632	7545	1·429	„
	Khoráwálá Khú „	56 23 50	3·878395	7558	1·431	„
397	Káimwálá Khú s.	70 33 30	3·986978	9705	1·838	„
	Khoráwálá Khú „	54 58 38	3·925718	8428	1·596	„
	Mithan-kí-bastí „	54 27 52	3·922969	8375	1·586	„
398	Khoráwálá Khú s.	65 12 24	4·016460	10386	1·967	„
	Mithan-kí-bastí „	56 46 20	3·980923	9570	1·813	„
	Gházíwattá No. 1 „	58 1 16	3·986978	9705	1·838	„
399	Mithan-kí-bastí s.	60 27 27	3·995079	9887	1·873	14
	Gházíwattá No. 1 „	53 29 36	3·960705	9135	1·730	„
	Gházíwattá No. 2 „	66 2 57	4·016460	10386	1·967	„
400	Gházíwattá No. 2 s.	63 48 20	4·021772	10514	1·991	„
	Gházíwattá No. 1 „	58 38 59	4·000293	10007	1·895	„
	Shujá-ábád „	57 32 41	3·995079	9887	1·873	„
401	Gházíwattá No. 1 s.	57 44 14	4·020863	10492	1·987	„
	Shujá-ábád „	64 20 6	4·048583	11184	2·118	„
	Miráliwán „	57 55 40	4·021772	10514	1·991	„
402	Shujá-ábád s.	46 8 38	3·931008	8531	1·616	„
	Miráliwán „	71 22 43	4·049671	11212	2·123	„
	Yáránwálá Khú „	62 28 39	4·020863	10492	1·987	„
403	Miráliwán s.	64 5 23	3·967574	9281	1·758	„
	Yáránwálá Khú „	60 8 3	3·951699	8947	1·695	„
	Chak „	55 46 34	3·931008	8531	1·616	„
404	Yáránwálá Khú s.	53 26 47	3·949399	8900	1·686	„
	Chak „	69 39 46	4·016568	10389	1·968	„
	Sobehwálá Khú „	56 53 27	3·967574	9281	1·758	„
405	Chak s.	56 15 52	3·924330	8401	1·591	„
	Sobehwálá Khú „	61 58 9	3·950221	8917	1·689	„
	Ghauswálá Khú „	61 45 59	3·949399	8900	1·686	„
406	Sobehwálá Khú s.	53 2 2	3·881248	7608	1·441	„
	Ghauswálá Khú „	65 2 35	3·936133	8632	1·635	„
	Theríwálá Khú „	61 55 23	3·924330	8401	1·591	„
407	Ghauswálá Khú s.	58 24 6	3·845589	7008	1·327	„
	Theríwálá Khú „	53 59 10	3·823162	6655	1·260	„
	Chúráwálá Khú „	67 36 44	3·881248	7608	1·441	„
408	Theríwálá Khú s.	74 17 36	3·930493	8521	1·614	„
	Chúráwálá Khú „	53 21 38	3·851415	7103	1·345	„
	Kúbáwálá Khú „	52 20 46	3·845589	7008	1·327	„
409	Chúráwálá Khú s.	71 11 58	3·997620	9945	1·884	„
	Kúbáwálá Khú „	54 35 58	3·932655	8564	1·622	„
	Nayá Pahálá „	54 12 4	3·930493	8521	1·614	„
410	Kúbáwálá Khú s.	40 13 53	3·845896	7013	1·328	„
	Nayá Pahálá „	73 25 38	4·017320	10407	1·971	„
	Fathi Khánwálá „	66 20 29	3·997620	9945	1·884	„

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used	No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles						Log. feet	Feet	Miles	
			° ′ ″				Inch				° ′ ″				Inch
	Nayá Pahálá	s.	50 31 21	3·760010	5755	1·090	14		Chúríwálá Khú	s.	75 43 0	4·235747	17209	3·259	14
411	Fathi Khánwálá	,,	59 18 54	3·806955	6411	1·214	,,	423	F	,,	48 19 55	4·122710	13265	2·512	,,
	Arain	,,	70 9 45	3·845896	7013	1·328	,,		Abdul Fathi-ká-Kotlá	s.	55 57 5	4·167710	14713	2·787	,,
	Fathi Khánwálá	s.	63 38 12	3·776678	5980	1·133	,,		Abdul Fathi-ká-Kotlá	s.	49 45 2	4·126273	13374	2·533	,,
412	Arain	,,	56 47 31	3·746935	5584	1·058	,,	424	F	s.	51 7 17	4·134859	13641	2·584	,,
	Serí Pohoran	,,	59 34 17	3·760010	5755	1·090	,,		Khairpúr No. 2	,,	79 7 41	4·235747	17209	3·259	,,
	Arain	s.	67 52 22	3·821998	6637	1·257	,,		Khairpúr No. 2	s.	47 49 12	4·061865	11531	2·184	,,
413	Serí Pohoran	,,	55 33 28	3·771518	5909	1·119	,,	425	F	,,	72 55 7	4·172431	14874	2·817	,,
	Serwálá Khú	,,	56 34 10	3·776678	5980	1·133	,,		Jalálábád	,,	59 15 41	4·126273	13374	2·533	,,
	Serí Pohoran	s.	63 42 5	3·854885	7160	1·356	,,		F	s.	54 6 21	3·992030	9818	1·860	,,
414	Serwálá Khú	,,	60 5 6	3·840238	6922	1·311	,,	426	Jalálábád	,,	53 49 34	3·990488	9783	1·853	,,
	Mahmúdpúr	,,	56 12 49	3·821998	6637	1·257	,,		E	,,	72 4 5	4·061865	11531	2·184	,,
	Serwálá Khú	s.	68 19 27	3·947606	8864	1·679	,,		Jalálábád	s.	74 56 0	4·047687	11161	2·114	,,
415	Mahmúdpúr	,,	63 1 49	3·929453	8501	1·610	,,	427	E	,,	46 54 43	3·926383	8441	1·599	,,
	Kasbá	,,	48 38 44	3·854885	7160	1·356	,,		Rájápúr	,,	58 9 17	3·992030	9818	1·860	,,
	Mahmúdpúr	s.	79 53 27	4·008709	10203	1·932	,,		E	s.	63 54 6	4·116979	13091	2·479	,,
416	Kasbá	,,	41 19 12	3·835222	6843	1·296	,,	428	Rájápúr	,,	66 8 15	4·124875	13331	2·525	,,
	Balel	,,	58 47 21	3·947606	8864	1·679	,,		Sher Sháh	,,	49 57 39	4·047687	11161	2·114	,,
	Kasbá	s.	54 10 54	4·008216	10191	1·930	,,		Rájápúr	s.	45 28 35	3·970238	9338	1·768	,,
417	Balel	,,	71 32 47	4·076335	11922	2·258	,,	429	Sher Sháh	,,	46 13 53	3·975792	9458	1·791	,,
	Labrá	,,	54 16 19	4·008709	10203	1·932	,,		D	,,	88 17 32	4·116979	13091	2·479	,,
	Balel	s.	49 8 39	3·892422	7806	1·478	,,		Sher Sháh	s.	77 36 32	4·206573	16091	3·047	,,
418	Labrá	,,	49 56 14	3·897548	7899	1·496	,,	430	D	,,	67 51 50	4·183557	15260	2·890	,,
	Bhakúwálá Khú	,,	80 55 7	4·008216	10191	1·930	,,		Gurjá	,,	34 31 38	3·970238	9338	1·768	,,
	Labrá	s.	68 0 54	4·016809	10395	1·969	,,		D	s.	65 9 28	4·243294	17510	3·316	,,
419	Bhakúwálá Khú	,,	67 51 2	4·016304	10383	1·966	,,	431	Gurjá	,,	58 20 29	4·215489	16424	3·111	,,
	Kauríwálá Khú	,,	44 8 4	3·892422	7806	1·478	,,		Thattí	,,	56 30 3	4·206573	16091	3·047	,,
	Bhakúwálá Khú	s.	57 14 7	3·975891	9460	1·792	,,		Yáránwálá Khú	s.	59 12 45	4·044117	11069	2·096	,,
420	Kauríwálá Khú	,,	55 14 59	3·965831	9243	1·751	,,	432	Shujá-ábád	,,	60 18 50	4·048983	11194	2·120	,,
	Amalwálá Khú	,,	67 30 54	4·016809	10395	1·969	,,		Pauntiá	,,	60 28 25	4·049671	11212	2·123	,,
	Kauríwálá Khú	s.	81 0 18	4·133503	13599	2·576	,,		Shujá-ábád	s.	51 44 35	3·961418	9150	1·733	,,
421	Amálwálá Khú	,,	55 35 41	4·055363	11360	2·151	,,	433	Pauntiá	,,	56 27 37	3·987321	9712	1·839	,,
	Chúríwálá Khú	,,	43 24 1	3·975891	9460	1·792	,,		Langrá	,,	71 47 48	4·044117	11069	2·096	,,
	Amalwálá Khú	s.	63 46 39	4·167710	14713	2·787	,,		Langrá	s.	62 53 26	4·038996	10939	2·072	,,
422	Chúríwálá Khú	,,	60 12 44	4·153331	14234	2·696	,,	434	Pauntiá	,,	68 59 28	4·059664	11473	2·173	,,
	F	,,	56 0 37	4·133503	13599	2·576	,,		Durátá	,,	48 7 6	3·961418	9150	1·733	,,

No. of triangle	Station		Corrected plane angle	Distance			Theodolite used
				Log. feet	Feet	Miles	
			° ′ ″				Inch
	Pauntiá	s.	52 19 19	3·965863	9244	1·751	14
435	Durátá	,,	58 11 16	3·996742	9925	1·880	,,
	Maujípúr	,,	69 29 25	4·038996	10939	2·072	,,
	Maujípúr	s.	70 9 25	3·999082	9979	1·890	,,
436	Durátá	,,	49 13 33	3·904927	8034	1·522	,,
	a	,,	60 37 2	3·965863	9244	1·751	,,
	Durátá	s.	47 0 39	3·863676	7306	1·384	,,
437	a	,,	40 33 50	3·812582	6495	1·230	,,
	b	,,	92 25 31	3·999082	9979	1·890	,,
	Maujípúr	s.	37 10 35	3·863676	7306	1·384	,,
438	a	,,	101 10 52	4·074122	11861	2·246	,,
	b	,,	41 38 33	3·904927	8034	1·522	,,
	a	s.	71 55 27	4·225899	16823	3·186	,,
439	b	,,	83 41 30	4·245243	17589	3·331	,,
	Kháng arh Fort			3·863676	7306	1·384	
	Sobelwálá Khú	s.	41 37 40	3·936562	8641	1·637	,,
440	Theríwálá Khú	,,	96 47 40	4·111143	12916	2·446	,,
	Kháupúr Dome			3·936133	8632	1·635	
	Theríwálá Khú	s.	147 17 47	4·176755	15023	2·845	,,
441	Chúráwálá Khú	,,	18 6 20	3·936562	8641	1·637	,,
	Kháupúr Dome			3·845589	7008	1·327	
	Chúráwálá Khú	s.	46 16 53	3·745494	5565	1·054	,,
442	Nayá Pahálá	,,	43 54 3	3·775889	5969	1·130	,,
	Sikandrábád Havelí			3·932655	8564	1·622	
	Serwálá Khú	s.	43 42 49	3·724991	5309	1·005	,,
443	Mahmúdpúr	,,	25 1 55	3·511946	3250	0·616	,,
	Khokar Mosque			3·854885	7160	1·356	
	Abdul Fathi-ká-Kotlá	s.	122 47 52	4·572171	37340	7·072	,,
444	F	s.	34 24 34	4·399715	25102	4·754	,,
	Multán City Dome			4·235747	17209	3·259	
	Abdul Fathi-ká-Kotlá	s.	73 2 50	4·394975	24830	4·703	,,
445	Khairpúr No. 2	s.	75 14 58	4·399715	25102	4·754	,,
	Multán City Dome			4·134859	13641	2·584	
	Abdul Fathi-ká-Kotlá	s.	48 45 27	4·078536	11982	2·269	,,
446	Khairpúr No. 2	s.	72 22 0	4·181460	15187	2·876	,,
	Multán	,,	58 52 33	4·134859	13641	2·584	,,
	Abdul Fathi-ka-Kotlá	s.	103 7 35	4·460943	28903	5·474	Inch 14
447	Khairpúr No. 2	s.	49 30 35	4·353550	22571	4·275	,,
	Multán Fort			4·134859	13642	2·584	
	Khairpúr No. 2	s.	128 38 16	4·587609	38691	7·328	,,
448	F	,,	35 41 51	4·460943	28903	5·474	,,
	Multán Fort			4·126273	13374	2·533	
	D	s.	81 3 5	4·249806	17775	3·366	,,
449	Gurjá	,,	35 32 21	4·019495	10459	1·981	,,
	Sher Sháh Dome			4·206573	16091	3·047	

* BHAWALPUR

SECONDARY SERIES.

	Sítpúr	s.	46 43 3	4·463974	29105	5·512	12
450	Marrí	,,	86 51 3	4·601197	39921	7·561	,,
	Lálkhán-kí-bastí	,,	46 25 54	4·461924	28968	5·486	,,
	Marrí	s.	42 32 46	4·350342	22405	4·243	,,
451	Lálkhán-kí-bastí	,,	76 0 10	4·507187	32150	6·089	,,
	Makhanbelá	,,	61 27 4	4·463974	29105	5·512	,,
	Lálkhán-kí-bastí	s.	66 58 37	4·453650	28422	5·383	,,
452	Makhanbelá	,,	66 30 42	4·452134	28323	5·364	,,
	Uch	,,	46 30 41	4·350342	22405	4·243	,,
	Lálkhán-kí-bastí	s.	57 17 34	4·541028	34756	6·583	,,
453	Uch	,,	79 25 1	4·608552	40602	7·690	,,
	Rámkalí	,,	43 17 25	4·452134	28323	5·364	,,
	Uch	s.	35 22 34	4·313733	20594	3·900	,,
454	Rámkalí	,,	66 54 54	4·514850	32723	6·197	,,
	Dhingáná	,,	77 42 32	4·541028	34756	6·583	,,
	Uch	s.	60 16 39	4·467701	29356	5·560	,,
455	Dhingáná	,,	44 15 0	4·372687	23588	4·467	,,
	Sonthálí	,,	75 28 21	4·514850	32723	6·197	,,
	Dhingáná	s.	60 15 53	4·469105	29451	5·578	,,
456	Sonthálí	,,	59 47 34	4·467042	29312	5·551	,,
	Lohárú	,,	59 56 33	4·467701	29356	5·560	,,

* The continuation of this series will be found in the Synopsis of Results of the Great Indus Series.

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Sonthálí s.	42 13 3	4·395350	24851	4·707	12
457	Lohárú ,,	85 0 7	4·566360	36843	6·978	,,
	Madi Shahíd ,,	52 46 50	4·469105	29451	5·578	,,
	Lohárú s.	56 41 4	4·397652	24983	4·732	,,
458	Madi Shahíd ,,	67 5 21	4·439935	27538	5·216	,,
	Ahmadpúr ,,	56 13 35	4·395350	24851	4·707	,,
	Madi Shahíd s.	76 50 47	4·498344	31502	5·966	,,
459	Ahmadpúr ,,	52 35 48	4·409918	25699	4·867	,,
	Murád Khairwálí ,,	50 33 25	4·397652	24983	4·732	,,
	Ahmadpúr s.	66 53 17	4·496064	31337	5·935	,,
460	Murád Khairwálí ,,	45 30 25	4·385693	24305	4·603	,,
	Dhorá ,,	67 36 18	4·498344	31502	5·966	,,
	Murád Khairwálí s.	58 46 33	4·495524	31299	5·928	,,
461	Dhorá ,,	62 19 50	4·510742	32415	6·139	,,
	Sanjrání ,,	58 53 37	4·496064	31337	5·935	,,
	Dhorá s.	43 55 48	4·359902	22904	4·338	,,
462	Sanjrání ,,	64 36 52	4·474582	29825	5·649	,,
	Lundí Bhít ,,	71 27 20	4·495524	31299	5·928	,,
	Sanjrání s.	84 58 11	4·565696	36787	6·967	,,
463	Lundí Bhít ,,	56 41 59	4·489477	30866	5·846	,,
	Soágan ,,	38 19 50	4·359902	22904	4·338	,,
	Lundí Bhít s.	42 59 53	4·404137	25359	4·803	,,
464	Soágan ,,	55 23 34	4·485804	30606	5·797	,,
	Mandíwálá ,,	81 36 33	4·565696	36787	6·967	,,
	Soágan s.	38 30 40	4·307918	20320	3·848	,,
465	Mandíwálá ,,	90 29 36	4·513646	32632	6·180	,,
	Lurúwálá ,,	50 59 44	4·404137	25359	4·803	,,
	Soágan s.	49 9 14	4·404565	25384	4·808	,,
466	Lurúwálá ,,	54 19 25	4·435503	27259	5·163	,,
	Lundá ,,	76 31 21	4·513646	32632	6·180	,,
	Soágan s.	63 14 24	4·471736	29630	5·612	,,
467	Lundá ,,	61 31 55	4·464963	29172	5·525	,,
	Mehrú ,,	55 13 41	4·435503	27259	5·163	,,
	Lundá s.	50 30 45	4·392660	24698	4·678	,,
468	Mehrú ,,	61 41 3	4·449829	28173	5·336	,,
	Paká ,,	67 48 12	4·471736	29630	5·612	,,
	Mehrú s.	45 49 1	4·302337	20060	3·799	Inch 12
469	Paká ,,	72 11 19	4·425415	26633	5·044	,,
	Jahánwálá ,,	61 59 40	4·392660	24698	4·678	,,
	Paká s.	77 23 0	4·453050	28382	5·375	,,
470	Jahánwálá ,,	59 0 32	4·396772	24933	4·722	,,
	Kauráwálá ,,	43 36 28	4·302337	20060	3·799	,,
	Jahánwálá s.	74 11 52	4·465490	29207	5·532	,,
471	Kauráwálá ,,	36 34 5	4·257305	18084	3·425	,,
	Nuníárwálí ,,	69 14 3	4·453050	28382	5·375	,,
	Kauráwálá s.	48 52 31	4·365579	23205	4·395	,,
472	Nuníárwálí ,,	59 39 36	4·424655	26586	5·035	,,
	Bháwalpúr ,,	71 27 53	4·465490	29207	5·532	,,
	Jahánwálá s.	45 15 6	4·424655	26586	5·035	,,
473	Kauráwálá ,,	85 26 36	4·571896	37316	7·067	,,
	Bháwalpúr ,,	49 18 18	4·453050	28382	5·375	,,
	Dhingáná s.	45 51 6	4·384968	24264	4·596	,,
474	Sonthálí ,,	73 54 28	4·511763	32491	6·154	,,
	Uch Tomb		4·467701	29356	5·560	
	Rámkalí s.	67 55 24	4·511763	32491	6·154	,,
475	Dhingáná ,,	76 6 26	4·531939	34036	6·446	,,
	Uch Tomb		4·313733	20594	3·900	
	Uch s.	56 48 45	4·465153	29185	5·527	,,
476	Dhingáná ,,	12 57 46	3·893352	7823	1·482	,,
	Hasan Dariá Tomb		4·514850	32723	6·197	
	Ahmadpúr s.	50 31 17	4·344022	22081	4·182	,,
477	Dhorá ,,	7 38 46	3·580510	3806	0·721	,,
	Ahmadpúr Tomb No. 1		4·385693	24305	4·603	
	Murád Khairwálí s.	39 42 20	4·315354	20671	3·915	,,
478	Dhorá ,,	64 42 41	4·466209	29256	5·541	,,
	Ahmadpúr Tomb No. 2		4·496064	31337	5·935	
	Soágan s.	41 31 30	4·286475	19341	3·663	,,
479	Mehrú ,,	49 10 47	4·343956	22078	4·181	,,
	Suiviár Thal Tower		4·464963	29172	5·525	
	Sanjrání s.	40 37 15	4·343956	22078	4·181	,,
480	Soágan ,,	73 50 48	4·512848	32572	6·169	,,
	Suiviár Thal Tower		4·489477	30866	5·846	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
481	Jahánwálá s.	40 45 25	4·300290	19966	3·781	12
	Nuniárwálí „	102 59 30	4·474214	29800	5·644	„
	Bháwalpúr Tomb No. 1		4·257305	18084	3·425	
482	Jahánwálá s.	33 26 27	4·225157	16794	3·181	„
	Kauráwálá „	77 54 57	4·474214	29800	5·644	„
	Bháwalpúr Tomb No. 1		4·453050	28382	5·375	
483	Jahánwálá s.	11 0 23	3·986834	9701	1·837	„
	Bháwalpúr „	36 14 49	4·477769	30045	5·690	„
	Bháwalpúr Mosque		4·571896	37316	7·067	
484	Jahánwálá s.	34 14 43	4·237424	17275	3·272	12
	Kauráwálá „	78 9 14	4·477769	30045	5·690	„
	Bháwalpúr Mosque		4·453050	28382	5·375	
485	Kauráwálá s.	7 50 59	3·644160	4407	0·835	„
	Bháwalpúr „	47 37 34	4·377292	23839	4·515	„
	Bháwalpúr Tomb No. 2		4·424655	26586	5·035	
486	Jahánwálá s.	28 25 51	4·442321	27690	5·244	„
	Bháwalpúr „	111 39 26	4·732832	54055	10·238	„
	Harí Sháh Tomb No. 2		4·571896	37316	7·067	

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W. H. COLE.

SUTLEJ SERIES.

SECONDARY TRIANGULATION.

AZIMUTHS OF SURROUNDING POINTS AT PRINCIPAL, PRINCIPAL-AUXILIARY AND SECONDARY STATIONS.

The following table contains, in the first column, the name of each Principal, Principal-Auxiliary or Secondary Station at which azimuths to Secondary Points have been observed immediately followed by those azimuths. The second column contains the number of the triangle giving the distance between the Station and the Point.

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
a	S.		
b	S.	11 11 37	437
Khángarh Fort		83 7 4	439
Maujípúr	„	270 0 45	436
Durátá	„	330 37 47	436
ABDUL FATHI-KA-KOTLA	**S.**		
Chúríwálá Khú	S.	7 45 26	423
F	„	63 42 31	423
Khairpúr No. 2	„	113 27 33	424
Multán	„	162 13 0	446
Multán City Dome		186 30 23	444
Multán Fort		216 35 8	447
ABOHAR	**S.**		
Amarkot	S.	20 27 33	225
Landá	„	67 44 58	226
Ballúwáná House		258 13 39	270
Pakí	„	267 4 41	224
Ráipúr	„	305 9 46	224

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
ADAMVAHAN	**S.**		
Chamb	S.	65 7 58	348
Sand Hill	„	96 57 49	347
Lodhran	„	171 25 42	346
Lodhran Dome		171 38 43	362
Sháh Sahálí Tomb		215 2 38	364
Trevit	„	222 7 59	346
Godrí, XIV		337 9 44	349
AHMADPUR	**S.**		
Lohárú	S.	106 31 56	458
Madi Shahíd	„	162 45 31	458
Murád Khairwálí	„	215 21 19	459
Dhorá	„	282 14 36	460
Ahmadpúr Tomb No. 1		332 45 53	477
ALAMWALA	**S.**		
Pakí	S.	30 28 3	221
Mídhá House		113 54 25	269
Lakarwálá House		195 47 59	261

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
ALAMWALA	**S.**		
Támkot	S.	201 21 31	219
Támkot House		205 10 31	263
Aulak	„	257 29 19	219
Malaut	„	318 5 11	220
AMALWALA KHU	**S.**		
F	S.	168 1 52	422
Chúríwálá Khú	„	231 48 31	421
Kauríwálá Khú	„	287 24 12	420
Bhakúwálá Khú	„	354 55 6	420
AMARKOT	**S.**		
Dhingáwálá	S.	67 27 11	227
Landá	„	107 7 54	226
Abohar House		200 2 52	272
Abohar	„	200 26 20	225
Ráipúr	„	251 29 13	225

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Amewala s.			
Mulá-ká-Váhí	s.	15 50 44	376
Mocharwálá	„	82 0 28	377
Pá'rámal	„	136 34 20	378
Miánpúr	„	321 14 51	376
Amir s.			
Bahamníwálá, XL		8 28 30	289
Bagáke	s.	55 24 44	306
Dayá Singwálá	„	116 48 49	307
Mokal	„	165 1 6	291
Gurú Harsahái	„	242 5 42	290
Joáríwálá, XLII		290 3 9	289
Arain, XXVII			
Mubárikpúr Fort		149 25 53	135
Chistí Tomb No. 1		178 21 46	132
Arain s.			
Nayá Pahálá	s.	31 49 53	411
Fathi Khánwálá	„	101 59 38	411
Serí Pohoran	„	158 47 9	412
Serwálá Khú	„	226 39 31	413
Aulak s.			
Malaut	s.	25 6 56	220
Alamwálá	„	77 32 17	219
Támkot	„	133 55 37	218
Támkot House		144 54 10	263
Sothá	„	196 51 3	218
Lúndá House		237 8 11	247
Chatrí	„	267 48 0	246
Korái House		343 31 57	249
b s.			
Khángarh Fort		107 29 59	439
a	s.	191 11 29	437
Maujípúr	„	232 50 2	438
Durátá	„	283 37 0	437
Bagake s.			
Lamochar Flag		45 5 50	326
Bhambá	s.	45 52 29	305
Atárí Flag		98 21 54	329
Dayá Singwálá	„	160 11 10	307
Amír	„	235 22 14	306
Bahamníwálá, XL		317 11 37	305
Baguwala s.			
Tuthe	s.	170 5 7	164
Golehwálá	„	234 25 55	163
Raináwálá	„	313 56 52	162
Barí Machákí	„	357 0 13	162
Bahamniwala, XL			
Taliwálá Sand Hill		11 36 30	94
Bihak	s.	71 23 19	323
Bhambá	„	94 49 26	304
Lamochar Flag		120 59 19	325
Bagáke	„	137 13 34	305
Amír	„	188 27 56	289
Chúng House		286 43 16	90
Madersá Temple		300 46 4	83
Lakhíwálá Sand Hill		321 23 10	86

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Bahamniwala, XL			
Nandgarh House		324 41 46	85
Arníwálá Thánah		357 25 42	92
Baja s.			
Jhandá Phidá	s.	236 26 22	195
Khárá	„	292 31 44	195
Sarái Flag		333 40 17	207
Virang	„	359 18 33	196
Balel s.			
Mahmúdpúr	s.	20 23 58	416
Bhakúwálá Khú	„	200 55 11	418
Labrá	„	250 3 50	417
Kasbá	„	321 36 37	416
Banawala, XXXIX			
Arníwálá House		16 13 59	96
Patartalá Sand Hill		75 2 21	100
Dhánwálá Custom Chaukí		83 17 11	98
Bahamníwálá Fort		166 14 57	89
Bám House		275 37 11	244
Drakhánwálá	s.	295 53 7	239
Ráthá Ther	„	358 39 23	264
Bangar, XXXII			
Mandresa Referring Mark		54 54 49	128
Kásimká House		114 46 53	127
Khái Mosque		196 41 54	126
Bara Hari s.			
Súrewálá	s.	6 45 21	199
Bhatiáwálá	„	63 6 44	198
Bhatiáwálá House		69 40 56	209
Virang	„	119 23 32	197
Khárá	„	187 53 35	197
Maur Tomb		238 27 42	205
Maur Dharamsálá		238 42 57	204
Madank Tower		301 52 25	212
Bari Machaki s.			
Sher Singwálá	s.	50 36 25	160
Bágúwálá	„	177 0 19	162
Raináwálá	„	224 12 17	161
Farídkot	„	282 48 18	160
Bhagsar, XLI			
Drakhánwálá	s.	11 58 32	239
Bám House		38 0 42	243
Arníwálá Thánah		53 18 19	92
Nandgarh House		70 7 46	84
Lakhíwálá Sand Hill		86 8 50	87
Bahamníwálá Fort		122 51 1	88
Chúng House		175 1 18	90
Akalgarh House		175 36 0	76
Maur „		199 50 11	74
Balamgarh „		227 16 14	80
Tibbí Sáhib Gurúdwárá		241 44 51	73
Mukatsar Temple No. 2		251 57 34	78
Mukatsar „ „ 1		252 1 29	71
Mukatsar Gurúdwárá		253 4 13	69
Rupáná House		288 0 47	237
Sothá	s.	293 58 45	216
Támkot	„	334 31 33	217

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Bhagsar, XLI			
Lakarwálá House		343 8 17	260
Lakhmiráná	„	350 3 32	241
Bhagthala s.			
Farídkot	s.	16 56 3	173
Kabar Buchá House		259 29 47	175
Tamáláwálá, LXX		289 48 6	173
Bhagu Khan s.			
Masákothá	s.	27 6 40	336
Kihror	„	72 24 29	337
Jalá	„	233 4 40	351
Fathipúr	„	267 7 28	335
Chilávahán	„	319 57 56	335
Chilávahán Tomb		320 2 19	356
Bhakuwala Khu s.			
Balel	s.	20 55 27	418
Amalwálá Khú	„	174 55 11	420
Kauríwálá	„	232 9 18	419
Labrá	„	300 0 20	418
Bhamba s.			
Dípoláná, XXXVIII		6 40 18	304
Bihak	s.	31 53 58	323
Bagáke	„	225 50 38	305
Lamochar Flag		226 12 49	325
Bahamníwálá, XL		274 45 38	304
Bhangar s.			
Golehwálá	s.	21 45 36	165
Tuthe	„	82 41 47	165
Kásúwálá	„	112 32 4	166
Piáráná	„	170 16 9	167
Bhangewala, XLIV			
Labáná House		9 23 34	66
Mukatsar Gurúdwárá		15 12 55	68
Mukatsar Temple No. 1		15 48 48	70
Tibbí Sáhib Gurúdwárá		21 19 38	72
Gulábewálá House		44 25 48	62
Kanaíwálá Tower		69 52 3	64
Ahal House		142 5 41	322
Kilá Dípsingwálá	s.	142 27 8	298
Dod	„	192 14 2	301
Farídkot Temple		258 47 19	57
Sarái Minaret No. 1		325 20 38	58
Sarái „ „ 2		325 22 16	60
Bhatiawala s.			
Bhular	s.	47 21 30	213
Virang	„	180 3 51	198
Bará Harí	„	243 4 56	198
Súrewálá	„	277 22 58	199
Kauní	„	344 35 44	200
Bhawalpur s.			
Bháwalpúr Mosque		12 56 15	483
Jahánwálá	s.	49 11 4	473
Nuniárwálí	„	71 20 39	472
Harí Sháh Tomb No. 2		160 50 30	486
Bháwalpúr Tomb No. 2		312 15 12	485
Kauráwálá	s.	359 52 46	472

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Bhular s.			
Bhatiáwálá	s.	227 20 9	213
Kauní	„	290 17 19	213
Bhuliana s.			
Kauní	s.	149 35 3	202
Dhúlkot House		173 24 47	214
Malan	„	194 13 52	202
Bihak s.			
Bodlá Núr Sháh	s.	18 31 53	327
Bhambá	„	211 52 42	323
Bahamníwálá, XL		251 18 15	323
Dípoláná, XXXVIII		310 23 21	324
Bodla Nur Shah s.			
Bihak	s.	198 31 36	327
Dípoláná, XXXVIII		268 7 42	327
Chak s.			
Miráliwán	s.	14 34 23	403
Yáránwálá Khú	„	70 20 57	403
Sobehwálá	„ „	140 0 43	404
Ghauswálá	„ „	196 16 35	405
Chamb s.			
Jhok, XII		72 12 52	350
Sand Hill	s.	164 1 3	348
Adamvahán	„	245 5 55	348
Harí Sháh Tomb No. 1		256 55 58	365
Godrí, XIV		285 1 23	349
Chanikhan, V			
Chanikhán-ká-got	s.	169 20 47	149
Chanikhán Bench-Mark		271 17 11	150
Chanikhan-ka-got s.			
Pirhár, VII		232 16 24	149
Chanikhán Bench-Mark		282 38 35	150
Chanikhán, V		349 20 43	149
Chatri s.			
Gúghá	s.	26 37 24	245
Aulak	„	87 50 33	246
Vadhan House		89 39 56	250
Lúndá House		113 23 41	247
Rukhálá House		251 45 2	251
Kot Bhái	s.	286 5 7	245
Madír House		304 16 59	252
Butrá House		307 23 14	253
Chilavahan s.			
Gaddan, XVIII		22 22 46	333
Masákothá	s.	67 13 34	336
Bhágú Khán	„	139 59 3	335
Fathipúr	„	229 53 49	334
Támiwálí, XX		298 3 24	333
Chuharlar, LXXXIII			
Khánbelá Tomb		227 56 16	153
Chunian s.			
Gandhí Flag		206 20 24	332
Dhalle	s.	241 17 20	315
Chunian s.			
Talwandí	s.	293 10 21	315
Múlápúr Temple		294 37 32	331
Thing House		323 32 44	330
Ghelan	„	334 55 41	316
Churawala, III			
Bháwalgarh Fort		218 21 11	124
Churawala Khu s.			
Ghauswálá Khú	s.	21 29 44	407
Theriwálá Khú	„	89 6 28	407
Khánpúr Dome		107 12 48	441
Kúbáwálá Khú	„	142 28 6	408
Nayá Pahálá	„	213 40 4	409
Sikandrábád Haveli		253 56 57	442
Churiwala Khu s.			
Kauriwálá Khú	s.	8 25 31	421
Amalwálá Khú	„	51 49 32	421
F	„	112 2 16	422
Abdul Fathi-ká-Kotlá	„	187 45 16	423
D s.			
Gurjá	s.	34 17 14	430
Thattí	„	99 26 42	431
Rájápúr	„	238 7 52	429
Sher Sháh Dome		313 14 9	449
Sher Sháh	„	326 25 24	429
Dad-ki-basti s.			
Jhandwálá Khú	s.	132 20 13	393
Mulláwálá Khú	„	195 55 19	392
Marí-ká-mauza	„	253 40 53	391
Gandá Dád-kí-bastí	„	315 37 22	391
Datekhan, XI			
Ahmadpúr Mosque		47 34 5	147
Khángáh House		244 58 17	145
Daya Singwala s.			
Atárí Flag		43 35 54	328
Kanganpurá	s.	170 54 40	309
Mokal	„	223 38 27	308
Amír	„	296 44 55	307
Bagáke	„	340 9 46	307
Dhabbar, V			
Bháwalgarh Fort		140 41 35	124
Mirzáwálá	s.	299 52 29	232
Matelí House		320 33 2	287
Dhalle s.			
Talwandí	s.	9 43 46	313
Múlápúr Temple		32 55 18	331
Chúnián	„	61 23 5	315
Gandhí Flag		122 55 46	332
Tháman	„	220 9 47	314
Khúdián	„	306 24 46	313
Dhaniot s.			
Trevit	s.	28 14 11	344
Rajanpúr	„	86 31 8	343
Thattí House		101 54 0	360
Dhaniot s.			
Kamálpúr	s.	152 59 16	342
Kharal	„	226 43 48	341
Kharak	„	289 48 7	341
Dhilan, LXVIII			
Faridkot	s.	128 39 16	155
Faridkot Temple		128 43 41	56
Dhimawala s.			
Khárá	s.	18 33 47	193
Jhandá Phidá	„	68 53 6	194
Sangú	„	113 22 34	158
Faridkot	„	190 14 52	157
Sindhú House		257 28 24	176
Kot Kapúrá	„	282 33 52	157
Dhingana s.			
Rámkalí	s.	82 35 41	454
Uch Tomb		158 42 7	474
Uch	„	160 18 13	454
Hasan Dariá Tomb		173 15 59	476
Sonthálí	„	204 33 13	455
Lohárú	„	264 49 6	456
Dhingawala s.			
Páníwálá House		78 30 24	278
Gamchal House		80 0 2	281
Usmán Kherá	s.	90 7 43	229
Jandwálá House		116 36 41	274
Panjává	„	130 52 35	228
Landá	„	169 37 53	227
Amarkot	„	247 23 47	227
Dhora s.			
Ahmadpúr Tomb No. 1		94 38 1	477
Ahmadpúr	s.	102 16 47	460
Ahmadpúr Tomb No. 2		105 10 24	478
Murád Khairwálí	s.	169 53 5	460
Sanjráni	„	232 12 55	461
Lundí Bhít	„	276 8 43	462
Dipolana, XXXVIII			
Begíwálí House		14 29 15	102
Rámpurá House		37 27 12	104
Fázilká Tahsíl		54 44 57	108
Fázilká Bench-Mark		55 15 53	106
Fázilká House		59 50 18	111
Bodlá Núr Sháh	s.	88 8 55	327
Bihak	„	130 24 17	324
Bhambá	„	186 39 58	304
Arniwálá Thánah		311 5 21	93
Arniwálá House		311 17 46	96
Taliwálá Sand Hill		322 38 42	94
Dhánwálá Custom Chaukí		324 17 28	98
Patartalá Sand Hill		346 38 43	100
Dod s.			
Bhangewálá, XLIV		12 15 2	301
Ahal House		53 47 40	321
Kilá Dípsingwálá	s.	76 56 3	300
Machiwárá	„	128 54 9	300
Dorta s.			
Lahorí	s.	178 38 36	382

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Dorta s.			
Pipalwálá	s.	242 56 18	381
Dumbáwálá	„	311 1 54	381
Drakhanwala s.			
Mídhá House		22 30 5	268
Ráthá Ther	s.	44 4 15	265
Múláwálá House		91 41 5	267
Bánáwálá, XXXIX		115 56 17	239
Bám House		140 50 32	243
Bhágsar, XLI		191 57 44	239
Dubrí House		248 43 34	262
Lakhmiráná House		257 47 58	242
Támkot	„	264 31 18	240
Lakarwálá House		279 14 16	260
Dumbawala s.			
Dortá	s.	131 2 32	381
Pipalwálá	„	190 45 40	380
Párámal	„	262 30 58	379
Mocharwálá	„	310 57 54	379
Durata s.			
b	s.	103 37 36	437
a	„	150 38 15	436
Maujípúr	„	199 51 48	435
Pauntiá	„	258 3 4	434
Langrá	„	306 10 10	434
E s.			
Sher Sháh	s.	62 38 33	428
Rájápúr	„	126 32 39	427
Jalálábád	„	173 27 22	426
F	„	245 31 27	426
F s.			
E	s.	65 32 18	426
Jalálábád	„	119 38 39	425
Khairpúr No. 2	„	192 33 46	424
Multán City Dome		209 16 29	444
Multán Fort		228 15 37	448
Abdul Fathi-ká-Kotlá	s.	243 41 3	423
Chúriwálá Khú	„	292 0 58	422
Amalwálá Khú	„	348 1 35	422
Faridkot s.			
Dhímáwálá	s.	10 15 20	157
Sangú	„	48 45 18	158
Sher Singwálá	„	85 43 49	159
Barí Machákí	„	102 51 3	160
Raináwálá	„	140 1 19	161
Bhágthalá	„	196 54 57	173
Kabar Buchá House		208 32 0	174
Tamáláwálá, LXX		237 24 45	155
Dhilan, LXVIII		308 35 13	155
Kot Kapúrá	„	324 11 30	156
Sindhú House		326 44 43	176
Fategarh, XXXLV			
Jhambherá Referring Mark		6 57 14	122
Asafwálá House		224 27 1	117
Jhajjal Tower		314 20 56	120
Fathi khanwala s.			
Kúbáwálá Khú	s.	47 38 29	410

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Fathi khanwala s.			
Serí Pohoran	s.	218 20 54	412
Arain	„	281 59 6	411
Nayá Pahálá	„	341 18 0	410
Fathipur s.			
Chilávahán	s.	49 55 33	834
Chilávahán Tomb		50 0 46	357
Bhágú Khán	„	87 10 19	335
Jalá	„	166 51 31	351
Sháhpúr No. 2	„	217 5 32	352
Támiwálí, XX		333 27 14	334
Fatteh, XXIX			
Chistí Tomb No. 1		102 50 1	132
Chistí Tomb No. 2		105 0 32	134
Márishonkshá House		142 55 56	130
Ferozpur Cotton Press s.			
Sháhdínwálá	s.	269 29 37	180
Malwal	„	307 20 2	180
Ferozpúr No. 2	„	356 37 50	181
Ferozpur No. 1 s.			
Ferozpúr Lightning Conductor No. 1		27 18 54	187
Ferozpúr Lightning Conductor No. 2		27 29 36	190
Sháhdínwálá	s.	285 45 11	172
Ferozpúr Gun Foundry No. 2		346 22 43	191
Ferozpúr Gun Foundry No. 1		347 15 40	182
Ferozpúr No. 2	s.	348 42 23	172
Ferozpur No. 2 s.			
Ferozpúr Church		47 47 12	185
Ferozpúr Lightning Conductor No. 2		144 33 15	189
Ferozpúr Lightning Conductor No. 1		144 45 40	188
Ferozpúr No. 1	s.	168 42 41	172
Ferozpúr Cotton Press	s.	176 37 53	181
Sháhdínwálá	s.	242 38 49	171
Malwal	„	286 41 8	171
Núrpúr	„	340 4 9	184
Gaddan, XVIII			
Chilávahán	s.	202 20 53	333
Gajiani, XXXI			
Mandresa Referring Mark		123 55 2	128
Kásimká House		154 18 43	127
Ganda Dad-ki-basti s.			
Dad-ki-bastí	s.	135 37 52	391
Mari-ká-mauza	„	192 57 45	390
Marí No. 2	„	255 55 38	389
Pípalwálá Khú	„	314 16 57	389
Gelehwala s.			
Lahorí	s.	20 46 44	384
Marí No. 1	„	83 7 19	385
Jhakar	„	156 57 13	386
Ukáwálá	„	324 37 12	384

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Ghallu, XXIV			
Shekhwahán Tomb		72 19 33	139
Got Káim Raís Fort		91 5 53	140
Hásilpúr House		231 37 17	138
Ghauswala Khu s.			
Chak	s.	16 16 50	405
Sobehwálá Khú	„	78 2 49	405
Theríwálá Khú	„	143 5 24	406
Chúráwálá Khú	„	201 29 30	407
Ghaziwala Khu s.			
Naurangsháh	s.	175 6 50	369
Váhíwálá Khú	„	227 20 58	368
Lodhran	„	278 3 55	367
Sand Hill	„	357 40 23	367
Ghaziwatta No. 1 s.			
Mithan-kí-bastí	s.	11 17 35	398
Gházíwattá No. 2	„	64 47 11	399
Shujá-ábád	„	123 26 10	400
Miráliwán	„	181 10 24	401
Khoráwálá Khú	„	313 16 19	398
Ghaziwatta No. 2 s.			
Shujá-ábád	s.	180 58 0	400
Gházíwattá No. 1	„	244 46 20	399
Mithan-kí-bastí	„	310 49 17	399
Ghelan s.			
Chúnián	s.	154 57 25	316
Thing House		238 50 23	330
Talwandí	„	243 13 55	312
Kanganpurá	„	319 18 16	312
Gidarvai s.			
Kingárá	s.	66 30 29	235
Tehrí House		98 18 25	258
Gúghá	„	120 51 3	235
Hosnár House		137 2 6	255
Butrá House		176 45 10	254
Kot Bhái	„	202 21 9	236
Jhúmbá Tower		292 21 31	257
Godri, XIV			
Bháwalpúr Bench-Mark		25 49 42	144
Chamb	s.	105 4 8	349
Harí Sháh Tomb No. 1		132 32 49	366
Adamvahán	„	157 10 26	349
Golehwala s.			
Bágúwálá	s.	54 27 13	163
Tuthe	„	130 47 30	164
Bhángar	„	201 44 53	165
Raináwálá	„	358 58 46	163
Gosain, XIII			
Khángáh House		132 9 52	145
Bháwalpúr Bench-Mark		206 3 34	144
Gugha s.			
Kingárá	s.	8 0 31	234
Malaut	„	69 51 48	234
Korái House		113 41 18	249

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Gugha S.			
Vadhan House		151 4 57	250
Chatrí	S.	206 36 35	245
Kot Bháí	„	258 2 39	236
Hosnár House		289 53 1	256
Gidárváí	„	300 48 22	235
Tehrí House		358 37 41	258
Gurja S.			
Thattí	S.	155 55 53	431
D.	„	214 16 22	430
Sher Sháh	„	248 48 0	430
Sher Sháh Dome		249 48 43	449
Guru Harsahai S.			
Amír	S.	62 10 0	290
Mokal	„	113 28 12	291
Mamdot	„	182 26 22	292
Kilá Dípsingwálá	„	236 34 51	297
Joáriwálá, XLII		357 4 19	290
Jahanwala S.			
Mehrú	S.	35 23 45	469
Nuniárwálí	„	200 11 41	471
Harí Sháh Tomb No. 2		200 42 36	486
Bháwalpúr	S.	229 8 27	473
Bháwalpúr Mosque		240 8 50	483
Bháwalpúr Tomb No. 1		240 57 6	481
Kauráwálá	S.	274 23 33	470
Paká	„	333 24 5	469
Jala S.			
Bhágú Khán	S.	53 7 7	351
Mailsí	„	203 45 24	353
Sháhpúr No. 2	„	250 6 6	352
Fathipúr	„	346 51 7	351
Jalalabad S.			
Rájápúr	S.	68 23 16	427
Khairpúr No. 2	„	240 22 1	425
F.	„	299 37 42	425
E.	„	353 27 16	426
Jhakar S.			
Marí No. 1	S.	28 7 26	386
Pípalwálá Khú	„	84 28 37	387
Marí No. 2	„	128 40 0	388
Gelehwálá	„	336 56 57	386
Jhambhera, XXXIII			
Mirzáwálá	S.	26 12 19	231
Matelí House		32 11 32	288
Fathigarh Fort		174 20 9	119
Jhambherá Referring Mark		180 0 7	123
Jhajjal Tower		228 28 7	121
Bakáinwálá House		243 14 13	276
Panjává	S.	272 46 56	230
Túlwálá House		292 2 59	283
Usmán Kherá	„	318 43 29	230
Gamchal House		322 18 12	280
Rámnagar Fort		349 48 58	285
Jhanda Phida S.			
Bájá	S.	56 27 38	195
Jhanda phida S.		° ′ ″	
Dhimáwálá	S.	248 51 33	194
Khárá	„	334 48 57	194
Jhandwala, XXXV			
Fathigarh Fort		101 45 25	118
Asafwálá House		163 25 8	116
Sathirwálá House		173 45 47	115
Khiuwálá House		191 33 4	112
Jhandwala Khu S.			
Káimwálá Khú	S.	130 11 52	395
Salonoán-kí-Khú	„	192 58 25	394
Mulláwálá Khú	„	251 54 49	393
Dád-kí-bastí	„	312 19 44	393
Jhok, XII			
Chamb	S.	252 10 8	350
Jhulan, IV			
Kháí Mosque		73 10 18	126
Mosque No. 1		272 32 26	125
Jiwan, XXVI			
Hásilpúr House		63 34 18	138
Shahr Farid House		235 52 24	137
Mubárikpúr Fort		266 58 17	136
Joariwala, XLII			
Chúng House		9 17 50	91
Akalgarh House		13 5 51	77
Madersá Temple		18 59 51	82
Nandgarh House		21 34 43	84
Lakhíwálá Sand Hill		24 30 59	86
Bahamniwálá Fort		72 18 31	88
Amír	S.	110 7 39	289
Gurú Harsahái	„	177 4 31	290
Kanaíwálá Tower		250 3 57	65
Labáná House		275 0 20	66
Gulábewálá House		299 57 55	63
Mukatsar Gurúdwárá		323 40 10	68
Mukatsar Temple No. 1		323 46 24	70
Mukatsar Temple No. 2		324 4 21	78
Tibbí Sáhib Gurúdwárá		324 22 58	72
Balamgarh House		353 6 32	80
Maur House		356 14 23	75
Josar, XXVIII			
Chistí, Tomb No. 2		2 43 33	134
Mubárikpúr Fort		36 38 52	135
Shahr Farid House		70 50 38	137
Márishonkshá House		260 14 31	130
Chistí, Tomb No. 1		358 58 46	133
Kaimsir, XIX			
Asráni House		174 0 55	143
Kaimwala Khu S.			
Mithan-kí-bastí	S.	122 32 15	397
Khoráwálá Khú	„	193 5 45	396
Salonoán-kí-Khú	„	249 20 31	395
Jhandwálá Khú	„	310 11 21	395
Kamalpur S.		° ′ ″	
Rajanpúr	S.	34 31 16	343
Kharal	„	279 49 28	342
Dhaniot	„	332 58 27	342
Kandani, I			
Khánbelá Tomb		163 47 2	153
Kanganpura S.			
Atárí Flag		23 31 8	328
Ghelan	S.	139 21 1	312
Talwandí	„	185 2 26	310
Mokal	„	268 45 33	309
Dayá Singwálá	„	350 54 14	309
Karnikhera, XXXVI			
Jhajjal Tower		11 55 2	120
Fathigarh Fort		55 30 22	118
Fázilká House		217 14 21	110
Fázilká Bench-Mark		221 35 10	107
Fázilká Tahsíl		222 21 14	109
Rámpurá House		250 43 59	105
Patartalá Sand Hill		273 59 28	101
Begíwálí House		278 42 12	103
Khiuwálá House		345 0 47	113
Sathirwálá House		347 52 51	114
Kasba S.			
Serwálá Khú	S.	51 39 17	415
Mahmúdpúr	„	100 18 1	415
Balel	„	141 37 13	416
Labrá	„	195 48 7	417
Kasur S.			
Kharepár	S.	6 34 3	295
Khúdián	„	52 55 57	295
Bhílá Tomb		63 11 23	317
Kotlí Madarsá		85 28 30	319
Tháman	„	105 47 27	296
Kasuwala S.			
Thuthe	S.	35 29 25	166
Malwal	„	188 47 59	168
Piáráná	„	235 22 8	167
Bhángar	„	292 30 22	166
Katera, XXXVII			
Khiuwálá House		69 37 14	112
Sathirwálá House		82 24 29	114
Asafwálá House		118 27 9	116
Rámpurá House		137 45 37	104
Begíwálí House		139 6 28	102
Fázilká Bench-Mark		141 39 44	106
Fázilká Tahsíl		141 47 7	108
Fázilká House		143 34 0	110
Dhánwálá Custom Chaukí		205 48 53	99
Taliwálá Sand Hill		221 7 25	95
Arniwálá House		239 35 37	97
Múláwálá House		248 12 25	266
Ráthá Ther	S.	289 28 58	264
Katgarh S.			
Mulá-ká-Váhí	S.	143 10 14	375

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
KATGARH S.			
Miánpúr	S.	205 13 40	374
Pathánwálá	„	272 5 51	373
Salsadar	„	315 23 0	373
KAUNI S.			
Bhular	S.	110 19 12	213
Bhatiáwálá	„	164 36 16	200
Súrewálá	„	213 3 30	200
Malan	„	268 50 24	201
Dhúlkot House		292 49 29	215
Bhuliáná	„	329 33 34	202
KAURAWALA S.			
Paká	S.	50 49 42	470
Jahánwálá	„	94 26 10	470
Nuniárwálí	„	131 0 15	471
Bháwalpúr Tomb No. 1		172 21 7	482
Bháwalpúr Mosque		172 35 24	484
Bháwalpúr	S.	179 52 46	472
Bháwalpúr Tomb No. 2		187 43 45	485
KAURIWALA KHU S.			
Labrá	S.	8 2 1	419
Bhakúwálá Khú	„	52 10 5	419
Amalwálá Khú	„	107 25 4	420
Chúríwálá Khú	„	188 25 22	421
KHAI S.			
Machíwárá	S.	17 27 51	303
Mamdot	„	73 20 19	302
Kháreparr	„	138 16 3	302
KHAIRPUR No. 1 S.			
Támiwálí, XX		72 50 1	141
Khairpúr Bench-Mark		154 19 46	142
Shekhwahán, XXII		242 45 37	141
KHAIRPUR No. 2 S.			
F	S.	12 34 3	424
Jalálábád	„	60 23 15	425
Multán City Dome		218 11 24	445
Multán	„	221 4 22	446
Multán Fort		243 55 47	447
Abdul Fathi-ká-Kotlá	S.	293 26 22	424
KHANBELA, II			
Allábád House		285 49 10	152
Khánbelá Tomb		357 44 19	154
KHANPUR S.			
Sháhpúr No. 2	S.	11 27 46	354
Mailsi	„	92 20 19	354
Malúkvahán Mosque		234 43 28	355
KHARA, XLV			
Sarái Minaret No. 2		64 30 13	60
Sarái Minaret No. 1		64 37 4	59
Faridkot Temple		194 11 37	56
KHARA S.			
Bará Harí	S.	7 53 50	197
Bhatiáwálá House		38 27 44	210
Sarái Flag		64 40 21	207

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
KHARA S.			
Virang	S.	69 7 20	196
Bájá	„	112 33 48	195
Jhandá Phidá	„	154 49 45	194
Dhímáwálá	„	198 33 2	193
Kot Kapúrá	„	244 50 45	193
Maur Tomb		313 37 11	205
Maur Dharmsálá		314 6 28	203
KHARAK S.			
Dhaniot	S.	109 50 45	341
Kharal	„	148 59 52	340
Kihror	„	226 18 20	339
Kihror Tomb No. 1		227 56 41	359
Sháhpúr No. 1	„	287 59 42	339
KHARAL S.			
Dhaniot	S.	46 45 7	341
Kamálpúr	„	99 51 36	342
Kihror	„	269 35 43	340
Kharak	„	328 58 33	340
KHAREPAR S.			
Mamdot	S.	13 38 0	294
Khúdián	„	84 32 7	294
Bhílá Tomb		128 14 16	317
Kasúr	„	186 33 35	295
Khái	„	318 13 2	302
KHORAWALA KHU S.			
Káimwálá Khú	S.	13 5 56	396
Mithan-kí-bastí	„	68 4 34	397
Gházíwattá No. 1	„	133 16 58	398
Salonoán-kí-Khú	„	316 42 6	396
KHUDIAN S.			
Mokal	S.	10 36 14	293
Talwandí	„	54 13 21	311
Dhalle	„	126 27 57	313
Thámán	„	180 56 55	296
Kotlí Madarsá		181 54 46	319
Bhílá Tomb		222 46 35	318
Kasúr	„	232 49 56	295
Kháreparr	„	264 26 34	294
Mamdot	„	312 42 11	293
KIHROR S.			
Kharak	S.	46 20 39	339
Kharal	„	89 39 21	340
Bhágú Khán	„	252 20 21	337
Masákothá	„	287 54 29	337
Sháhpúr No. 1	„	358 0 5	338
KILA DIPSINGWALA S.			
Gurú Harsahái	S.	56 37 1	297
Mamdot	„	157 18 54	297
Machíwárá	„	204 17 24	299
Dod	„	256 52 16	300
Bhangewálá, XLIV		322 24 21	298
Ahal House		323 13 15	321
KINGARA S.			
Kolanwálí	S.	64 17 33	233
Malaut	„	125 59 58	233

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
KINGARA S.			
Gúghá	S.	188 0 6	234
Tehrí House		194 20 59	259
Gidárváí	„	246 27 23	235
KOLANWALI S.			
Ráipúr	S.	84 19 23	223
Paki	„	118 52 17	222
Malaut	„	193 17 49	222
Kingárá	„	244 14 10	233
KOT BHAI S.			
Gidárváí	S.	22 22 7	236
Hosnár House		52 37 14	255
Butrá House		63 44 29	253
Gúghá	„	78 6 18	236
Madír House		96 2 57	252
Chatrí	„	106 7 57	245
Rukhálá House		125 10 12	251
Jhúmbá Tower		327 53 59	257
KOT KAPURA S.			
Maur Dharmsálá		43 23 6	203
Maur Tomb		43 26 27	206
Khárá	S.	64 54 20	193
Dhímáwálá	„	102 36 42	157
Sindhú House		139 23 52	177
Faridkot	„	144 13 52	156
Tamáláwálá, LXX		196 0 20	156
KUBAWALA KHU S.			
Theríwálá Khú	S.	14 48 22	408
Fathí Khánwálá	„	227 37 45	410
Nayá Pahálá	„	267 51 38	409
Chúráwálá Khú	„	322 27 36	408
LABRA S.			
Kasbá	S.	15 48 26	417
Balel	„	70 4 45	417
Bhakúwálá Khú	„	120 0 59	418
Kauríwálá Khú	„	188 1 53	419
LAHORI S.			
Marí No. 1		150 25 30	385
Gelehwálá	S.	200 46 28	384
Ukáwálá	„	260 39 46	383
Pípalwálá	„	297 24 36	382
Dortá	„	358 38 35	382
LALKHAN-KI-BASTI S.			
Sítpúr	S.	85 37 30	450
Marrí	„	132 3 24	450
Makhanbelá	„	208 3 34	451
Uch	„	275 2 11	452
Rámkalí	„	332 19 45	453
LANDA S.			
Jandwálá House		29 4 38	274
Panjává	S.	89 19 14	228
Díwán Kherá House		127 10 26	275
Bakáinwálá House		143 17 17	277
Abohar	„	247 39 52	226
Abohar House		248 38 3	273
Amarkot	„	287 4 1	226
Dhingáwálá	„	349 37 24	227

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Langra S.			
Durátá	S.	126 11 3	434
Pauntiá	„	189 4 29	433
Shujá-ábád	„	260 52 17	433
Lodhran S.			
Sand Hill	S.	43 6 15	347
Ghaziwálá Khú	„	98 6 3	367
Váhiwálá Khú	„	142 40 52	368
Rajanpúr	„	221 3 12	345
Trevit	„	281 59 53	345
Sháh Sahálí Tomb		320 27 33	363
Adamvahán	„	351 25 20	346
Loharu S.			
Dhingáná	S.	84 51 46	456
Sonthálí	„	144 48 19	456
Madi Shahíd	„	229 48 26	457
Ahmadpúr	„	286 29 30	458
Lunda S.			
Lurúwálá	S.	4 50 47	466
Soágan	„	81 22 8	466
Mehrú	„	142 54 3	467
Paká	„	193 24 48	468
Lundi Bhit S.			
Dhorá	S.	96 11 26	462
Sanjráni	„	167 38 46	462
Soágan	„	224 20 45	463
Mandiwálá	„	267 20 38	464
Luruwala S.			
Mandiwálá	S.	79 31 24	465
Soágan	„	130 31 8	465
Lundá	„	184 50 33	466
Machiwara S.			
Kilá Dípsingwálá	S.	24 18 42	299
Mamdot	„	117 43 35	299
Khái	„	197 26 56	303
Dod	„	308 51 40	300
Madi Shahid S.			
Lohárú	S.	49 50 11	457
Sonthálí	„	102 37 1	457
Murád Khairwálí	„	265 54 3	459
Ahmadpúr	„	342 44 50	458
Magreja, III			
Allábád House		78 5 14	152
Jánpúr House		129 15 38	151
Mahmudpur S.			
Khokar Mosque		8 20 55	443
Serí Pohoran	S.	39 31 49	414
Balel	„	200 23 44	416
Kasbá	„	280 17 11	415
Serwálá Khú	„	343 19 0	414
Mailsi S.			
Jalá	S.	23 46 36	353
Malúkvahán Mosque		253 32 5	355
Khánpúr	„	272 18 50	354
Sháhpúr No. 2	„	329 54 33	353
Makhanbela S.			
Lálkhán-kí-bastí	S.	28 4 32	451
Marrí	„	89 31 36	451
Uch	„	321 33 50	452
Malan S.			
Bhuliáná	S.	14 14 31	202
Dhúlkot House		57 8 40	214
Kauní	„	88 52 32	201
Súrewálá	„	149 26 34	201
Madank Tower		197 13 42	211
Malaut S.			
Kolanwálí	S.	13 18 39	222
Pakí	„	65 38 4	221
Alamwálá	„	138 6 55	220
Aulak	„	205 5 42	220
Gúghá	„	249 48 50	234
Kingárá	„	305 57 25	233
Malwal S.			
Kásúwálá	S.	8 48 15	168
Núrpúr	„	49 53 26	184
Ferozpúr Church		103 3 33	185
Ferozpúr No. 2	„	106 42 59	171
Ferozpúr Gun Foundry No. 1		107 16 44	183
Ferozpúr Cotton Press	S.	127 21 56	180
Sháhdínwálá	S.	176 42 9	170
Saiyidwálá House		221 34 5	179
Walhúr	„	229 51 2	169
Piáráná	„	302 22 16	168
Mamdot S.			
Gurú Harsahái	S.	2 26 37	292
Mokal	„	58 36 58	292
Khúdián	„	132 46 37	293
Kharepár	„	193 36 53	294
Khái	„	253 16 11	302
Machíwárá	„	297 40 22	299
Kilá Dípsingwálá	„	337 16 59	297
Mamudeh, I			
Mosque No. 1		197 31 55	125
Mandiwala S.			
Lundí Bhit	S.	87 23 26	464
Soágan	„	168 59 59	464
Lurúwálá	„	259 29 35	465
Mandresa, XXX			
Márishonkshá House		49 7 6	131
Mandresa Referring Mark		270 43 11	129
Mari No. 1 S.			
Pípalwálá Khú	S.	136 39 24	387
Jhakar	„	208 7 4	386
Gelehwálá	„	263 6 41	385
Lahorí	„	330 25 8	385
Mari No. 2 S.			
Pípalwálá Khú	S.	15 39 47	388
Gandá Dád-kí-bastí	„	75 56 21	389
Marí-ká-mauza	„	133 7 43	390
Jhakar	„	308 39 16	388
Mari-ka-mauza S.			
Gandá Dád-kí-bastí	S.	12 57 54	390
Dád-kí-bastí	„	73 41 32	391
Mullawálá Khú	„	135 41 7	392
Marí No. 2	„	313 7 9	390
Marri S.			
Sítpúr	S.	38 52 27	450
Makhanbelá	„	269 28 38	451
Lálkhán-kí-bastí	„	312 1 24	450
Masakotha S.			
Sháhpúr No. 1	S.	54 42 2	338
Kihror Tomb No. 1		106 27 12	358
Kihror	„	107 57 27	337
Bhágú Khán	„	207 5 30	336
Chilávahán Tomb		247 7 36	356
Chilávahán	„	247 11 17	336
Maujipur S.			
Durátá	S.	19 52 6	435
b	„	52 50 56	438
a	„	90 1 31	436
Pauntiá	„	310 22 41	435
Mehru S.			
Soágan		18 6 5	467
Suiviár Thal Tower		67 16 52	479
Jahánwálá	S.	215 22 20	469
Paká	„	261 11 21	468
Lundá	„	322 52 24	467
Mianpur S.			
Katgarh	S.	25 13 59	374
Mulá-ká-Váhí	„	91 18 28	375
Amewálá	„	141 15 30	376
Pathánwálá	„	321 13 26	374
Miraliwan S.			
Ghaziwattá No. 1	S.	1 10 25	401
Shujá-ábád	„	59 6 5	401
Yáránwálá Khú	„	130 28 48	402
Chak	„	194 34 11	403
Mirzawala S.			
Matelí House		49 16 13	287
Dhabbar, V		119 56 46	232
Jhambherá, XXXIII		206 10 8	231
Usmán Kherá	S.	249 57 14	231
Rámnagar Fort		295 36 2	285
Mithan-ki-basti S.			
Ghaziwattá No. 2	S.	130 49 56	399
Ghaziwattá No. 1	„	191 17 23	398
Khoráwálá Khú	„	248 3 43	397
Káimwálá Khú	„	302 31 35	397
Mocharwala S.			
Dumbáwálá	S.	130 58 45	379
Párámal	„	188 27 43	378
Amewálá	„	261 59 38	377
Mulá-ká-Váhí	„	317 28 42	377

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Mokal s.			
Dayá Singwálá	s.	43 41 4	308
Kanganpurá	„	88 48 36	309
Talwandí	„	150 53 23	310
Khúdián	„	190 34 50	293
Mamdot	„	238 31 8	292
Gurú Harsahái	„	293 22 37	291
Amír	„	344 59 49	291
Moni-dhai, VIII			
Jhambherá Referring Mark		305 13 47	122
Mukantsingwala, XLIII			
Rupáná House		17 10 33	237
Balamgarh House		87 26 38	81
Madersá Temple		89 12 29	82
Mukatsar Temple No. 2		93 40 24	79
Maur House		101 10 25	74
Akalgarh House		107 59 15	76
Gulábewálá House		144 54 7	62
Kanaiwálá Tower		169 39 24	64
Labáná House		183 24 46	67
Sarái Minaret No. 1		246 48 11	58
Sarái Minaret No. 2		246 50 54	61
Sothá	s.	358 30 24	216
Mula-ka-Vahi s.			
Mocharwálá	s.	137 29 19	377
Amewálá	„	195 50 31	376
Miánpúr	„	271 17 36	375
Katgarh	„	323 9 41	375
Mullawala Khu s.			
Dád-kí-bastí	s.	15 55 31	392
Jhandwálá Khú	„	71 55 30	393
Salonoán-kí-Khú	„	131 29 4	394
Marí-ká-mauza	„	315 40 40	392
Multan s.			
Khairpúr No. 2	s.	41 5 7	446
Abdul Fathi-ká-Kotlá	„	342 12 34	446
Murad Khairwali s.			
Ahmadpúr Tomb No. 2		29 34 54	478
Ahmadpúr	s.	35 22 59	459
Madi Shahíd	„	85 56 24	459
Sanjráni	„	291 6 1	461
Dhorá	„	349 52 34	460
Nandlal, VIII			
Malkáná House		302 15 23	148
Naurangshah s.			
Salsadar	s.	157 30 54	371
Pauliwálá	„	207 43 11	370
Váhiwálá Khú	„	273 5 38	369
Ghaziwálá Khú	„	355 6 44	369
Naya Pahala s.			
Chúrawálá Khú	s.	33 40 31	409
Kúbáwálá Khú	„	87 52 35	409
Fathi Khánwálá	„	161 18 13	410
Arain	„	211 49 34	411
Sikandrábád Havelí		349 46 28	442

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Nuniarwali s.			
Jahánwálá	s.	20 12 16	471
Bháwalpúr	„	251 18 37	472
Bháwalpúr Tomb No. 1		277 12 46	481
Kauráwálá	s.	310 58 13	471
Nurkanch, IX			
Ahmadpúr Mosque		3 24 56	146
Malkáná House		119 54 1	148
Nurpur s.			
Ferozpúr Church		155 19 2	186
Ferozpúr No. 2	s.	160 4 44	184
Ferozpúr Gun Foundry No. 2		161 53 39	192
Malwal	s.	229 52 10	184
Paka s.			
Lundá	s.	13 25 24	468
Mehrú	„	81 13 36	468
Jahánwálá	„	153 24 55	469
Kauráwálá	„	230 47 55	470
Paki s.			
Ráipúr	s.	37 38 44	223
Abohar	„	87 9 8	224
Ballúwáná House		112 38 36	271
Alamwálá	„	210 25 52	221
Malaut	„	245 34 9	221
Kolanwálí	„	298 49 12	222
Panjava s.			
Túlwálá House		1 44 57	284
Gamchal House		19 39 3	280
Usmán Kherá	s.	29 43 52	229
Jhambherá, XXXIII		92 50 49	230
Bakáinwálá House		195 4 46	276
Díwán Kherá House		245 45 46	275
Landá	„	269 16 44	228
Dhingáwálá	„	310 49 36	228
Páníwálá House		352 28 51	278
Kamál Kherá House		357 4 52	282
Paphra, IV			
Jánpúr House		6 58 7	151
Paramal s.			
Mocharwálá	s.	8 27 51	378
Dumbáwálá	„	82 31 57	379
Pípalwálá	„	136 34 16	380
Amewálá	„	316 33 38	378
Pathanwala s.			
Salsadar	s.	18 16 47	372
Katgarh	„	92 6 46	373
Miánpúr	„	141 14 2	374
Pauliwálá	„	321 14 34	372
Pauliwala s.			
Naurangsháh	s.	27 43 38	370
Salsadar	„	97 32 59	371
Pathánwálá	„	141 15 12	372
Vahiwálá Khú	„	320 34 36	370

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Pauntia s.			
Langrá	s.	9 4 37	433
Durátá	„	78 4 5	434
Maujípúr	„	130 23 24	435
Yáránwálá Khú	„	252 8 35	432
Shujá-ábád	„	312 37 0	432
Piarana s.			
Kásúwálá	s.	55 23 33	167
Malwal	„	122 23 25	168
Saiyidwálá House		153 9 8	178
Walhúr	„	190 35 3	169
Bhángar	„	350 15 52	167
Pipalwala s.			
Dumbáwálá	s.	10 45 51	380
Dortá	„	62 57 7	381
Lahorí	„	117 25 26	382
Ukáwálá	„	164 45 35	383
Párámal	„	316 33 28	380
Pipalwala Khu s.			
Gandá Dád-kí-bastí	s.	134 17 28	389
Marí No. 2	„	195 39 35	388
Jhakar	„	264 27 41	387
Marí No. 1	„	316 38 50	387
Pirhar, VII			
Chanikhán-ká-got	s.	52 19 50	149
Ahmadpúr Mosque		285 21 7	146
Rainawala s.			
Barí Machákí	s.	44 13 31	161
Bágúwálá	„	133 58 12	162
Golehwálá	„	178 58 48	163
Faridkot	„	319 59 46	161
Raipur s.			
Amarkot	s.	71 33 12	225
Abohar House		122 43 6	272
Abohar	„	125 12 32	224
Balluwáná House		191 53 32	270
Pakí	„	217 37 3	223
Kolanwálí	„	264 14 37	223
Rajanpur s.			
Lodhran	s.	41 4 29	345
Lodhran Dome		41 44 11	361
Kamálpúr	„	214 30 4	343
Thattí House		228 11 40	360
Dhaniot	„	266 29 7	343
Trevit	„	335 23 34	344
Rajapur s.			
Sher Sháh	s.	12 40 2	428
D	„	58 8 37	429
Jalálábád	„	248 22 30	427
E	„	306 31 47	427
Ramkali s.			
Lálkhán-kí-bastí	s.	152 21 29	453
Uch Tomb		194 38 24	475
Uch	„	195 38 54	453
Dhingáná	„	262 33 48	454

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Ratha Ther s.			
Katerá, XXXVII		109 33 2	264
Bánáwálá, XXXIX		178 39 30	264
Múláwálá House		187 4 45	266
Drakhánwálá	s.	224 1 11	265
Mídhá House		234 39 39	268
Salonoan-ki-Khu s.			
Jhandwálá Khú	s.	12 58 34	394
Káimwálá Khú	,,	69 21 11	395
Khoráwálá Khú.	,,	136 42 35	396
Mulláwálá Khú	,,	311 28 32	394
Salsadar s.			
Katgarh	s.	135 23 42	373
Pathánwálá	,,	198 16 34	372
Pauliwálá	,,	277 32 8	371
Naurangsháh	,,	337 30 30	371
Sand Hill s.			
Gházíwálá Khú	s.	177 40 29	367
Lodhran	,,	223 4 13	347
Adamvahán	,,	276 55 25	347
Harí Sháh Tomb No. 1		294 42 49	365
Chamb	s.	344 0 42	348
Sangu s.			
Sher Singwálá	s.	133 26 51	159
Faridkot	,,	228 43 8	158
Dhímáwálá	,,	293 20 52	158
Sanjrani s.			
Dhorá	s.	52 15 11	461
Murád Khairwálí	,,	111 8 48	461
Suiviár Thal Tower		222 2 53	480
Soágan	,,	262 40 8	463
Lundí Bhít	,,	347 38 19	462
Seri Pohoran s.			
Fathi Khánwálá	s.	38 21 14	412
Mahmúdpúr	,,	219 31 24	414
Serwálá Khú	,,	283 13 29	413
Arain	,,	338 46 57	412
Serwala Khu s.			
Arain	s.	46 39 56	413
Serí Pohoran	,,	103 14 6	413
Khokar Mosque		119 36 23	443
Mahmúdpúr	,,	163 19 12	414
Kasbá	,,	231 38 39	415
Shahdinwala s.			
Ferozpúr Gun Foundry No. 2		59 38 14	191
Ferozpúr Gun Foundry No. 1		62 22 58	182
Ferozpúr No. 2	s.	62 40 35	171
Ferozpúr Lightning Conductor No. 2		89 5 13	189
Ferozpúr Lightning Conductor No. 1		89 7 50	187
Ferozpúr Cotton Press	s.	89 31 26	180
Ferozpúr No. 1	s.	105 47 15	172
Walhúr	,,	276 23 37	170
Malwal	,,	356 42 4	170

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Shahpur No. 1 s.			
Kharak	s.	108 2 7	339
Kihror	,,	178 0 11	338
Kihror Tomb No. 1		178 33 34	358
Masákothá	,,	234 39 10	338
Shahpur No. 2 s.			
Fathipúr	s.	37 7 27	352
Jalá	,,	70 8 25	352
Mailsí	,,	149 55 40	353
Khánpúr	,,	191 27 24	354
Shekhwahan, XXII			
Khairpúr No. 1	s.	62 48 56	141
Shekhwahán Tomb		220 19 54	139
Got Káim Raís Fort		227 13 31	140
Sher Shah s.			
Gurjá	s.	68 49 21	430
D	,,	146 25 53	429
Rájápúr	,,	192 39 46	428
E	,,	242 37 25	428
Sher Singwala s.			
Barí Machákí	s.	230 35 18	160
Faridkot	,,	265 39 57	159
Sangú	,,	313 25 9	159
Shuja-abad s.			
Gházíwattá No. 2	s.	0 58 1	400
Langrá	,,	80 53 11	433
Pauntiá	,,	132 37 46	432
Yáránwálá Khú	,,	192 56 36	402
Miráliwán	,,	239 5 14	401
Gházíwattá No. 1	,,	303 25 20	400
Sitpur s.			
Marrí	s.	218 50 47	450
Lálkhán-kí-bastí	,,	265 33 50	450
Soagan s.			
Lundí Bhít	s.	44 23 6	463
Sanjrání	,,	82 42 56	463
Suiviár Thal Tower		156 33 44	479
Mehrú	,,	198 5 14	467
Lundá	,,	261 19 38	466
Lurúwálá	,,	310 28 52	465
Mandíwálá	,,	348 59 32	464
Sobehwala Khu s.			
Yáránwálá Khú	s.	16 53 38	404
Khánpúr Dome		163 22 20	440
Theríwálá Khú	,,	205 0 0	406
Ghauswálá Khú	,,	258 2 2	405
Chak	,,	320 0 11	404
Sonthali s.			
Dhingáná	s.	24 34 20	455
Uch Tomb		98 28 48	474
Uch	,,	100 2 41	455
Madi Shahíd	,,	282 33 43	457
Lohárú	,,	324 46 46	456

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Sotha s.			
Aulak	s.	16 52 4	218
Támkot	,,	64 16 50	217
Bhágsar, XLI		114 3 24	216
Múkantsingwálá, XLIII		178 30 29	216
Lúndá House		357 32 7	248
Surewala s.			
Kauní	s.	33 4 38	200
Bhatiáwálá	,,	97 24 38	199
Bhatiáwálá House		108 31 40	209
Bará Harí	,,	186 45 13	199
Madank Tower		262 2 56	211
Malan	,,	329 25 34	201
Talwandi s.			
Kanganpurá	s.	5 2 51	310
Ghelan	,,	63 17 5	312
Chúnián	,,	113 15 15	315
Dhalle	,,	189 42 55	313
Khúdián	,,	234 9 19	311
Mokal	,,	330 50 45	310
Tamalawala, LXX			
Kot Kapúrá	s.	16 2 0	156
Faridkot	,,	57 28 47	155
Bhágthalá	,,	109 51 2	173
Kabar Buchá House		122 13 56	174
Tamiwali, XX			
Asráni House		53 37 35	143
Chilávahán	s.	118 6 46	333
Fathipúr	,,	153 28 52	334
Khairpúr Bench-Mark		245 35 10	142
Khairpúr No. 1	s.	252 48 55	141
Tamkot s.			
Alamwálá	s.	21 22 31	219
Drakhánwálá	,,	84 33 46	240
Lakhmiráná House		93 33 37	241
Bhágsar, XLI		154 33 13	217
Dubrí House		211 5 19	262
Rupáná House		224 6 45	238
Sothá	,,	244 13 51	217
Aulak	,,	313 53 39	218
Thaman s.			
Khúdián	s.	0 56 59	296
Dhalle	,,	40 13 2	314
Kasúr	,,	285 41 30	296
Kotlí Madarsá		359 6 19	320
Thatti s.			
D	s.	279 25 9	431
Gurjá	,,	335 55 12	431
Theriwala Khu s.			
Sobehwálá Khú	s.	25 0 21	406
Khánpúr Dome		121 48 1	440
Kúbáwálá Khú	,,	194 48 12	408
Chúráwálá Khú	,,	269 5 48	407
Ghauswálá Khú	,,	323 4 58	406

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Trevit s.			
Adamvahán	s.	42 9 48	346
Sháh Sahálí Tomb		48 57 28	363
Lodhran	„	102 2 4	345
Lodhran Dome		103 1 10	361
Rajanpúr	„	155 24 28	344
Dhaniot	„	208 13 4	344
Tuthe s.			
Kásúwálá	s.	215 28 41	166
Bhángar	„	262 39 21	165
Golehwálá	„	310 45 47	164
Bágúwálá	„	350 4 42	164
Uch s.			
Rámkalí	s.	15 39 46	453
Lálkhán-kí-bastí	„	95 4 47	452
Makhanbelá	„	141 35 28	452
Sonthálí	„	280 0 33	455
Hasan Dariá Tomb		283 28 27	476
Dhingáná	„	340 17 12	454

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Ukawala s.			
Lahorí	s.	80 40 27	383
Gelehwálá	„	144 37 37	384
Pípalwálá	„	344 45 26	383
Usman Khera s.			
Rámnagar Fort		22 33 7	286
Mirzáwálá	s.	70 1 50	231
Jhambherá, XXXIII		138 45 54	230
Panjává	„	209 42 24	229
Túlwálá House		229 52 50	283
Kamál Kherá House		240 37 42	282
Dhingáwálá	„	270 3 16	229
Páníwálá House		285 47 3	279
Vahiwala Khu s.			
Gházíwálá Khú	s.	47 22 5	368
Naurangsháh	„	93 6 51	369
Paulíwálá	„	140 35 22	370
Lodhran	„	322 39 51	368

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Virang s.			
Bhatiáwálá	s.	0 3 51	198
Bájá	„	179 18 34	196
Khárá	„	249 5 17	196
Sarái Flag		258 3 40	208
Bará Harí	„	299 21 44	197
Walhur s.			
Piáráná	s.	10 35 26	169
Malwal	„	49 52 34	169
Saiyidwálá House		54 47 13	178
Sháhdínwálá	„	96 25 14	170
Yaranwala Khu s.			
Shujá-ábád	s.	12 56 50	402
Pauntiá	„	72 9 35	432
Sobehwálá Khú	„	196 53 21	404
Chak	„	250 20 8	403
Miráliwán	„	310 28 11	402

March 1875.

W. H. COLE.

SUTLEJ SERIES.

CO-ORDINATES AND DESCRIPTIONS OF ALL STATIONS AND POINTS.

The following table gives the co-ordinates of all the stations and other fixed points, arranged in alphabetical order, also the descriptions of the secondary stations and intersected (or unvisited) points, and references to the preceding pages where the descriptions of the principal stations are given. In certain instances numbers are added which have reference to the given data of the triangles by which the station or point has been fixed; when these numbers are omitted it is to be understood that no triangles are given.

Note.—λ stands for Latitude North; L for Longitude East of Greenwich; H for Height of station in feet above mean sea level, if determined trigonometrically, H_s for the Height when found by spirit leveling and *h* for Height of station tower or pillar. For visited stations and for other points of superior accuracy the values of λ and L are given to two places of decimals; for well determined objects to one place, and for the remaining points to the nearest second. Principal stations are distinguished by the Roman numerals I, II, &c; secondary stations by the letters h. s. and s.

Name of station, district, description, co-ordinates &c.	Name of station, district, description, co-ordinates &c.	Name of station, district, description, co-ordinates &c.
a s. (*Multán*) ° ′ ″ λ 29 55 17·16 L 71 15 29·57 No. 436	**Abohar** s. (*Sarsá*) On a high mound, formed of the ruins of the ancient fortified town of Abhánagar, about 150 yards from the present town of Abohar. Marked by a platform with ⊙ inscribed thereon. ° ′ ″ λ 30 9 20·00 L 74 14 37·35 No. 224	**Adamvahán Tomb,** (*Multán*) Dome. ° ′ ″ λ 29 28 4·0 L 71 41 23·1
Abdul Fathi-ká-Kotlá s. (*Multán*) λ 30 8 57·92 L 71 28 13·29 No. 423	**Adamvahán** s. (*Multán*) On top of Munshí Khán Chand's house in village; mauza Adamvahán, thánah and tahsíl Lodhran. Marked by a platform 6 inches high and 4 feet square, with ⊙ inscribed thereon and covered up for protection. λ 29 28 2·53 L 71 41 24·48 No. 346	**Ahal House,** (*Faridkot*) Flag on Gurdattá Baniá's house. λ 30 42 42·3 L 74 32 48·1 Nos. 321, 322
Abohar House, (*Sarsá*) Flag in town. λ 30 9 7 L 74 14 29 Nos. 272, 273		**Ahmadpúr Mosque,** (*Bhawalpúr*) N.W. corner minaret. λ 29 8 37·1 L 71 18 16·4 Nos. 146, 147

Name of station, district, description, co-ordinates &c.

Ahmadpúr s.
(*Bháwalpúr*) On turret of Kúrá Sarráf's paká building in city; kárdárí Ahmadpúr. Marked by a masonry pillar 3 inches high with ⊙ inscribed thereon and covered up for protection.

	°	′	″
λ	29	8	36·22
L	71	18	17·89

No. 458

Ahmadpúr Tomb No. 1.
(*Bháwalpúr*) Spire of Azmat Sultán's tomb.

λ	29	8	2·7
L	71	18	37·5

No. 477

Ahmadpúr Tomb No. 2.
(*Bháwalpúr*) Spire of Akbar Bhawadín's tomb.

λ	29	8	38·7
L	71	19	0·7

No. 478

Akalgarh House,
(*Ferozpúr*) Flag on Ranjít Sing Lambardár's house.

λ	30	30	55·1
L	74	26	5·4

Nos. 76, 77

Akbar-da-Búnga, VII. of the Jogí-Tílá Series.
(*Bháwalpúr*) About 0·5 of a mile S.W. of the village so called; thánah and kárdárí Bháwalgarh. Denoted by a perforated masonry pillar with a mark-stone let into the floor of the passage at the ground level.

λ	30	12	32·43
L	73	31	18·78
Hs	538·35		
h	29		

No. 17

Alamwálá s.
(*Sarsá*) On top of Dharmsálá in village; mauza Alamwálá, chaukí Malaut, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30	16	7·23
L	74	27	48·48

No. 219

Allábád House,
(*Bháwalpúr*) Flag on Hakúmat Rái Mukhí's house.

λ	28	57	8·9
L	70	55	10·8

No. 152

Amalwálá Khú s.
(*Multán*) Also called Hamídpúr bastí s. near the 10th mile-stone on road from Multán to Shujá-ábád.

λ	30	5	24·59
L	71	25	51·20

No. 420

Name of station, district, description, co-ordinates &c.

Amarkot s.
(*Sarsá*) On top of Rukmuddín Zamíndár's house; mauza Amarkot, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

	°	′	″
λ	30	3	38·58
L	74	12	10·92

No. 225

Amewálá s.
(*Multán*) Near a well so called; mauza Miánpúr, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29	40	33·47
L	71	33	15·16

No. 376

Amír s.
(*Ferozpúr*) On ruins of a kachá fort near the village so called, and close to the high road between Ferozpúr and Fázilká; mauza Amír, thánah Bagáke, tahsíl Mukatsar. Marked by a platform with ⊙ inscribed thereon.

λ	30	38	19·63
L	74	18	29·11

No. 289

Arain, XXVII.
(*Vide page 6—H.*)

λ	29	40	55·57
L	72	53	21·57
H	529		
h	26		

No. 27

Arain s.
(*Multán*)

λ	29	59	48·88
L	71	24	35·77

No. 411

Arníwálá House,
(*Sarsá*) Flag in village.

λ	30	20	49
L	74	18	1

Nos. 96, 97

Arníwálá Thánah,
(*Sarsá*) Flag.

λ	30	20	56·7
L	74	17	55·0

Nos. 92, 93

Asafwálá House,
(*Sarsá*) Flag on Gúdar Kasáí's house.

λ	30	22	21·7
L	73	59	42·5

Nos. 116, 117

Asrání House,
(*Bháwalpúr*) Flag on Asá Mukhí's house.

λ	29	31	13·2
L	72	9	58·2

No. 143

Atárí Flag
(*Gogaira*) In village.

λ	30	36	25
L	74	5	10

Nos. 328, 329

Name of station, district, description, co-ordinates &c.

Aulak s.
(*Sarsá*) On a sand hill about 0·75 of a mile E. of village so called; mauza Aulak, chaukí Malaut, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

	°	′	″
λ	30	17	14·73
L	74	33	39·66

No. 218

b. s.
(*Multán*)

λ	29	54	6·21
L	71	15	13·46

Nos. 437, 438

Bagáke s.
(*Ferozpúr*) On turret of thánah, about 1·50 miles W. of village so called; tahsíl Mukatsar, iláká Mamdot. Marked by a platform with ⊙ inscribed thereon.

λ	30	35	21·70
L	74	13	30·97

Nos. 305, 306

Bágikí s.
(*Ferozpúr*)

λ	30	59	7·62
L	74	45	11·07

Bágúwálá s.
(*Faridkot*)

λ	30	45	41·42
L	74	42	4·49

No. 162

Bahádurwálá s.
(*Ferozpúr*) On mound.

λ	30	59	47·44
L	74	41	26·36

Bahamníwálá, XL
(*Vide page 8—H.*)

λ	30	31	46·28
L	74	17	21·40
H	637		
h	34		

No. 7

Bahamníwálá Fort,
(*Ferozpúr*) Flag.

λ	30	32	23
L	74	15	56

Nos. 88, 89

Bájá s.
(*Ferozpúr*) On roof of Bútá Lambardár's house, W. of and in village.

λ	30	33	27·94
L	74	41	10·96

No. 195

Bakáinwálá House,
(*Sarsá*) Flag on Kádú Lambardár's house.

λ	30	9	57·7
L	74	0	48·3

Nos. 276, 277

Name of station, district, description, co-ordinates &c.

Bakhíderá, XVI.
(*Vide page* 5—*H.*)

	° ′ ″
λ	29 26 32·99
L	71 54 17·11
H	446
h	15

No. 38

Bakhíderá Bench-Mark.
(*Bháwalpúr*) Stone B.M. imbedded to the S.W. of village so called, on the village side of the road from Bháwalpúr to Ferozpúr.

λ	29 26 43·80
L	71 53 56·43
H_s	390·07

Bakhíderá Village,
(*Bháwalpúr*) Flag.

λ	29 26 59
L	71 54 9

Balamgarh House,
(*Ferozpúr*) Flag on Jawáhar Sing's house.

λ	30 28 0·2
L	74 28 22·8

Nos. 80, 81

Balel s.
(*Multán*)

λ	30 2 40·41
L	71 25 28·42

No. 416

Ballúwáná House,
(*Sarsá*) Flag in village.

λ	30 10 32
L	74 21 15

Nos. 270, 271

Bám House,
(*Sarsá*) Flag on Jagtá Lambardár's house in village.

λ	30 22 22·2
L	74 22 46·4

Nos. 243, 244

Bánáwálá, XXXIX.
(*Vide page* 8—*H.*)

λ	30 22 43·28
L	74 18 39·80
H	659
h	35

No. 8

Bangar, XXXII.
(*Vide page* 7—*H.*)

λ	29 59 0·34
L	73 9 58·30
H	526
h	25

No. 22

Name of station, district, description, co-ordinates &c.

Bará Harí s.
(*Ferozpúr*) On roof of Dharmsálá in centre of village.

	° ′ ″
λ	30 28 56·34
L	74 44 46·03

No. 197

Barí Machákí s.
(*Faridkot*) On Bhagwán Sing Lambardár's house, S.E. side of village so called.

λ	30 41 27·04
L	74 42 19·90

No. 160

Bázidpúr Village,
(*Ferozpúr*) Flag.

λ	30 53 48
L	74 42 43

Begíwálí House,
(*Sarsá*) Flag on Púran Lambardár's house.

λ	30 20 44·9
L	74 7 13·4

Nos. 102, 103

Berwálá, XXV.
(*Vide page* 6—*H.*)

λ	29 36 22·18
L	72 41 35·97
H	513
h	15

No. 29

Bhágsar, XLI.
(*Vide page* 8—*H.*)

λ	30 26 29·17
L	74 26 29·02
H	672
h	30

No. 6

Bhágthalá s.
(*Faridkot*) On roof of Kálá Sing Zamíndár's house in centre of village.

λ	30 46 31·29
L	74 49 52·54

No. 173

Bhágú Khán s.
(*Multán*) On top of a deserted house, said to be haunted; mauza Arápúr, thánah Kihror, tahsíl Mailsí. Marked by a platform 6 in. high and 4 ft. square with ⊙ inscribed thereon and covered up for protection.

λ	29 39 49·68
L	72 5 43·16

No. 335

Bhakúwálá Khú s.
(*Multán*) Also called Fatúwálpúr s.

λ	30 3 53·45
L	71 26 0·52

No. 418

Name of station, district, description, co-ordinates &c.

Bhambá s.
(*Ferozpúr*) On Dulla Zamíndár's house in village; mauza Bhambá, thánah Bagáke, tahsíl Mukatsar. Marked by a platform with ⊙ inscribed thereon.

	° ′ ″
λ	30 32 18·81
L	74 9 53·19

No. 304

Bhángar s.
(*Ferozpúr*) On top of Ját's house, W. corner of village so called.

λ	30 50 15·26
L	74 45 59·12

No. 165

Bhangewálá, XLIV.
(*Vide page* 9—*H.*)

λ	30 38 27·34
L	74 36 37·89
H	673
h	30

No. 3

Bhatiáwálá House,
(*Ferozpúr*) Flag on Diál Sing Baniá's house in village.

λ	30 27 53·1
L	74 41 29·0

Nos. 209, 210

Bhatiáwálá s.
(*Ferozpúr*) On high mound, about 0·50 of a mile S.E. of village so called. Marked by a paká platform 1 ft. high.

λ	30 27 22·73
L	74 41 13·03

No. 198

Bháwalgarh Fort,
(*Bháwalpúr*) Flag on gateway.

λ	30 9 54·6
L	73 31 54·6

No. 124

Bháwalpúr Bench-Mark.
(*Bháwalpúr*) Stone B.M. imbedded at the southern base of a masonry monument erected over an Englishman, who died during the march of Indian troops to Candahár. The tomb, a conspicuous object, lies 1·50 miles W. of the town of Bháwalpúr, by the roadside.

λ	29 22 52·37
L	71 41 39·67
H_s	375·03

No. 144

Bháwalpúr Mosque,
(*Bháwalpúr*) Spire of dome of Sher Sháh Jalál's masjid S. of Bháwalpúr.

λ	29 22 11·3
L	71 42 41·3

Nos. 483, 484

Name of station, district, description, co-ordinates &c.

Bháwalpúr s.
(*Bháwalpúr*) On Munshí Rám Chand's high paká house in town so called; Kárdárí Narangáwáh. Marked by a paká masonry pillar 6 in. high, with ⊙ inscribed thereon and covered up for protection.

	° ′ ″
λ	29 23 44·87
L	71 43 5·80

Nos. 472, 473

Bháwalpúr Tomb No. 1.
(*Bháwalpúr*) Spire of dome of Bíbí Mahtáb's tomb.

λ	29 22 6·5
L	71 42 41·2

Nos. 481, 482

Bháwalpúr Tomb No. 2.
(*Bháwalpúr*) Centre dome of Bháwal Khán's tomb, E. of town.

λ	29 23 15·5
L	71 43 42·7

No. 485

Bhílá Tomb.
(*Lahor*) Kalas of dome of Panáh Sháh's tomb.

λ	31 3 54·7
L	74 23 55·7

Nos. 317, 318

Bhular s.
(*Ferozpúr*) On roof of Dharmsálá in centre of village.

λ	30 25 14·60
L	74 38 32·51

No. 213

Bhuliáná s.
(*Ferozpúr*) On roof of Dátá Sing Zamíndár's house in village. A platform 1 ft. high and 3 ft. in diameter defines the station.

λ	30 19 44·44
L	74 45 11·56

No. 202

Bihak s.
(*Sarsá*) On top of Gámá goldsmith's house in village; mauza Bihak, thánah, tahsíl and subdivision district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30 28 51·79
L	74 7 24·43

Nos. 323, 324

Bodlá Núr Sháh s.
(*Sarsá*) Stone B.M. imbedded on the N.W. side of the road near Bodlá Núr Sháh, and S. of old fort Jamáldín-ká-kot.

λ	30 27 26·78
L	74 6 51·54
H_s	586·20

No. 327

Burj Mastewálá Flag
(*Faridkot*) On Gyán Sing Lambardár's house.

λ	30 43 43·3
L	74 42 49·2

Name of station, district, description, co-ordinates &c.

Butrá House,
(*Ferozpúr*) Flag in village.

	° ′ ″
λ	30 15 5
L	74 42 15

Nos. 253, 254

Chak s.
(*Multán*) Also called Dhorehwálá Khú s.

λ	29 55 18·36
L	71 22 7·20

No. 403

Chamb s.
(*Multán*) On a high sand hill near one of the villages of Chamb; mauza Chamb, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29 26 21·19
L	71 37 14·84

No. 348

Chanikhán, V.
(*Vide page 4—H.*)

λ	29 5 14·61
L	71 3 13·92
H_s	319·59
h	28

No. 49

Chanikhán Bench-Mark.
(*Bháwalpúr*) Stone B.M. imbedded on the site of a deserted village crossed by the road near Chanikhán's well.

λ	29 5 10·96
L	71 6 17·21
H_s	327·18

No. 150

Chanikhán-ká-got s.
(*Bháwalpúr*) On prominent paká house in centre of town.

λ	29 5 48·54
L	71 3 6·65

No. 149

Chatrí s.
(*Ferozpúr*) On a sand hill about 0·75 of a mile S. of Sohág village and about 1·50 miles N.E. of Gurúsar; cháukí Kot Bháí, thánah and tahsíl Mukatsar. Marked by a platform with ⊙ inscribed thereon.

λ	30 17 24·78
L	74 38 43·93

Nos. 245, 246

Chilávahán s.
(*Multán*) On a turret of large paká tomb of Maulví Golám Murtazá, about 0·19 of a mile S.E. of village so called; mauza Chilávahán, thánah Kihror, tahsíl Mailsí. Marked by a platform 6 in. high and 4 ft. square with ⊙ inscribed thereon and covered up for protection.

λ	29 37 29·55
L	72 7 57·88

No. 333

Name of station, district, description, co-ordinates &c.

Chilávahán Tomb,
(*Multán*) Dome of Maulví Kamaruddín's tomb.

	° ′ ″
λ	29 37 29·7
L	72 7 57·4

Nos. 356, 357

Chistí House,
(*Bháwalpúr*) Flag on Mír Hájim's house.

λ	29 48 3·0
L	72 52 54·3

Chistí Tomb No. 1.
(*Bháwalpúr*) Tái Dín's.

λ	29 47 52·1
L	72 53 7·9

Nos. 132, 133

Chistí Tomb No. 2.
(*Bháwalpúr*) Khwájah Núr Muhammad's.

λ	29 48 11·6
L	72 52 56·2

No. 134

Chuharlár, LXXXIII.
(*Vide page 3—H.*)

λ	28 52 52·82
L	70 40 51·83
H_s	300·55
h	25

No. 54

Chúng House,
(*Ferozpúr*) Flag on Tilok Sing's house.

λ	30 29 28·2
L	74 26 11·0

Nos. 90, 91

Chúnián s.
(*Lahor*) On turret of Siwáí Khatrí's house in town; thánah and tahsíl Chúnián, sub-division district Kasúr. Marked by a platform, with ⊙ inscribed thereon.

λ	30 57 45·35
L	74 1 20·22

Nos. 315, 316

Chúrawála, III. of the Jogí-Tílá Series.
(*Bháwalpúr*) About 3 miles S. by E. of the little village of Máchiwála-búnga; thánah Chaveka, kárdárí Bháwalgarh. Denoted by a perforated masonry pillar with a markstone let into the floor of the passage at the ground level.

λ	30 3 53·80
L	73 26 25·91
H	558
h	31

No. 18

Chúráwálá Khú s.
(*Multán*)

λ	29 57 44·40
L	71 23 3·33

No. 407

Name of station, district, description, co-ordinates &c.

Chúríwálá Khú s.
(*Multán*)

	° ′ ″
λ	30 6 47·80
L	71 27 52·90

No. 421

D. s.
(*Multán*) On left bank of Trimáb.

λ	30 7 18·67
L	71 20 22·57

No. 429

Dád-kí-bastí s.
(*Multán*) About 0·28 of a mile S.W. by W. of village so called.

λ	29 48 4·33
L	71 24 36·75

No. 391

Dátekhán, XI.
(*Vide page 4—H.*)

λ	29 15 27·92
L	71 26 48·03
H_s	397·16
h	3

No. 43

Dayá Singwálá s.
(*Lahor*) On top of Dayá Sing Lambardár's house in village; mauza Dayá Sing, thánah and tahsíl Chúnián, sub-division district Kasúr. Marked by a platform with ⊙ inscribed thereon.

λ	30 41 38·19
L	74 10 53·97

Nos. 307, 308

Dhabbar, V.
(*Vide page 7—H.*)

λ	30 2 35·16
L	73 38 48·74
H	610
h	24

No. 16

Dhalle s.
(*Lahor*) On top of Panjává Sing Zamíndár's house in village; mauza Dhalle, thánah and tahsíl Chúnián, sub-division district Kasúr. Marked by a platform with ⊙ inscribed thereon.

λ	31 3 4·83
L	74 12 38·77

Nos. 313, 314

Dhaniot s.
(*Multán*) On a mound 0·25 of a mile N.E. of village so called; mauza Dhaniot, thánah Kihror, tahsíl Mailsí. Marked by a platform with ⊙ inscribed thereon and covered up for protection.

λ	29 35 16·40
L	71 47 20·60

No. 341

Dhánwálá Custom Chaukí.
(*Sarsá*) Flag on Chaukí on roadside.

λ	30 22 12·4
L	74 13 38·2

Nos. 98, 99

Name of station, district, description, co-ordinates &c.

Dhilan, LXVIII.
(*Vide page 9—H.*)

	° ′ ″
λ	30 34 54·96
L	74 55 38·48
H	731
h	20

No. 79 (of Gurhágarh Meridional Series) *vide* Synoptical Vol. of that series page 20—F.

Dhímáwálá s.
(*Farídkot*) On Múr Sing's house in centre of village. *Station since destroyed.*

λ	30 35 56·23
L	74 46 47·08

No. 157

Dhingáná s.
(*Bháwalpúr*) On a high sand hill about 0·40 of a mile W. of village so called; zamíndárí Chaiman Taurí, kárdárí Sultánwáh. Marked by a peg driven in and covered up for protection.

λ	29 9 27·62
L	71 7 50·77

No. 454

Dhingáwálá s.
(*Sarsá*) On top of Hírá Lambardár's house; mauza Dhingáwálá, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30 1 11·53
L	74 5 24·38

No. 227

Dhorá s.
(*Bháwalpúr*) On a high sand hill, about 0·75 of a mile S.W. of village so called; zamíndárí Dhorá, kárdárí Ahmadpúr. Marked by a peg driven in and covered up for protection.

λ	29 7 45·13
L	71 22 45·73

No. 460

Dhúlkot House,
(*Ferozpúr*) Flag on Ranjít Sing Zamíndár's house in village.

λ	30 23 8·8
L	74 44 44·3

Nos. 214, 215

Dípoláná, XXXVIII.
(*Vide page 8—H.*)

λ	30 27 30·80
L	74 9 14·30
H	628
h	26

No. 9

Díwán Kherá House,
(*Sarsá*) Flag on Baniá's house.

λ	30 6 54
L	74 2 39

No. 275

Name of station, district, description, co-ordinates &c.

Dod s.
(*Farídkot*) On highest house in village belonging to Sudh Sing Lambardár. A brick with ⊙ inscribed on it and imbedded in the roof defines the station.

	° ′ ″
λ	30 46 4·88
L	74 38 32·77

Nos. 300, 301

Dortá s.
(*Multán*) About 0·50 of a mile S. of well so called; mauza Ghází Chanar, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29 42 37·81
L	71 28 32·97

No. 381

Drakhánwálá s.
(*Sarsá*) On a sand hill about 0·50 of a mile N. of village so called; mauza Drakhánwálá, chaukí Arníwálá, thánah, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30 20 5·16
L	74 24 55·12

Nos. 239, 240

Dubrí House,
(*Ferozpúr*) Flag on Hukmí Lambardár's house in village.

λ	30 22 6·2
L	74 30 54·0

No. 262

Dumbáwálá s.
(*Multán*) About 1·25 miles S.E. by E. of well so called; mauza Ghází Chanar, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29 41 39·34
L	71 29 49·92

No. 379

Durátá s.
(*Multán*) Also called Marandá s.

λ	29 53 51·07
L	71 16 25·18

No. 434

E. s.
(*Multán*) On Canal bank.

λ	30 7 2·32
L	71 23 36·17

No. 426

F. s.
(*Multán*) On mound in plain.

λ	30 7 42·43
L	71 25 17·58

No. 422

Fakkarsar House,
(*Ferozpúr*) Flag on Gulább Sing Lambardár's house.

λ	30 11 55·9
L	74 36 58·3

Name of station, district, description, co-ordinates &c.

Farídkot, XLVI.
(*Vide page 9—H.*)

	° ′ ″
λ	30 40 3·87
L	74 47 48·73
H	709
h	26

No. 1

Farídkot s.
(*Farídkot*) On roof over staircase of Sundar Mal Baniá's house in fort in centre of town.

λ	30 40 23·46
L	74 47 42·97

No. 155

Farídkot Temple,
(*Farídkot*) Small dome spire in Rájá's palace in city.

λ	30 40 21·5
L	74 47 47·1

Nos. 56, 57

Fategarh, XXXIV.
(*Vide page 8—H.*)

λ	30 16 18·74
L	73 52 51·68
H	595
h	27

No. 13

Fathigarh Fort.
(*Bháwalpúr*) Also called Gurdiáná; flag on highest bastion.

λ	30 15 16·4
L	73 50 39·8

Nos. 118, 119

Fathikhánwálá s.
(*Multán*)

λ	30 0 0·71
L	71 23 31·75

No. 410

Fathipúr s.
(*Multán*) On top of a Maháputr Bráhman's house in village; mauza Fathipúr, thánah and tahsíl Mailsí. Marked by a platform 4 ft. square with ⊙ inscribed thereon and covered up for protection.

λ	29 40 4·71
L	72 11 28·92

No. 334

Fatteh, XXIX.
(*Vide page 7—H.*)

λ	29 46 17·64
L	73 1 4·79
H	551
h	16

No. 25

Fázilká Bench-Mark.
(*Sarsá*) Stone B.M. imbedded opposite the Kachahrí and near the hospital at Fázilká.

λ	30 24 27·21
L	74 4 8·96
H	582·33

Nos. 106, 107

Name of station, district, description, co-ordinates &c.

Fázilká House,
(*Sarsá*) Flag on Deputy Commissioner's house.

	° ′ ″
λ	30 24 57·4
L	74 4 9·9

Nos. 110, 111

Fázilká Tahsíl.
(*Sarsá*)

λ	30 24 25·6
L	74 4 12·2

Nos. 108, 109

Ferozpúr Barrack.
(*Ferozpúr*) Skylight of 4th barrack from E.

λ	30 54 41·4
L	74 39 58·9

Ferozpúr Church,
(*Ferozpúr*) Flag on belfry.

λ	30 55 4·1
L	74 39 21·8

Nos. 185, 186

Ferozpúr Cotton Press s.
(*Ferozpúr*) On centre of building.

λ	30 56 44·63
L	74 39 28·62

Nos. 180, 181

Ferozpúr Gun Foundry No. 1.
(*Ferozpúr*) Mr. H. G. Coate's chimney.

λ	30 55 15·1
L	74 39 39·2

Nos. 182, 183

Ferozpúr Gun Foundry No. 2.
(*Ferozpúr*) Chimney in entrenchment.

λ	30 55 6·8
L	74 39 44·3

Nos. 191, 192

Ferozpúr Jail,
(*Ferozpúr*) Flag on room over doorway.

λ	30 57 6·9
L	74 39 20·8

Ferozpúr Kachahrí,
(*Ferozpúr*) Flag on centre of building.

λ	30 55 37·2
L	74 39 22·2

Ferozpúr Lightning Conductor No. 1.
(*Ferozpúr*) Magazine.

λ	30 56 42·5
L	74 38 22·5

Nos. 187, 188

Ferozpúr Lightning Conductor No. 2.
(*Ferozpúr*) Magazine.

λ	30 56 42·3
L	74 38 22·1

Nos. 189, 190

Name of station, district, description, co-ordinates &c.

Ferozpúr No. 1. s.
(*Ferozpúr*) On high mound of Núr Sháh-ká-kháng'h and alongside of Núr Sháh's tomb in centre of town near tahsíl.

	° ′ ″
λ	30 57 44·92
L	74 38 59·88

No. 172

Ferozpúr No. 2. s.
(*Ferozpúr*) On roof of Mr. H. G. Coate's two-storied house.

λ	30 55 14·23
L	74 39 34·79

No. 171

Gaddan, XVIII.
(*Vide page 5—H.*)

λ	29 29 19·15
L	72 4 7·10
H	459
h	*Not forthcoming*

No. 36

Gajiáni, XXXI.
(*Vide page 7—H.*)

λ	29 50 53·07
L	73 10 54·52
H	556
h	15

No. 23

Gamchal House,
(*Sarsá*) Flag on Harbhajan Zamíndár's house.

λ	29 59 54·9
L	73 57 6·9

Nos. 280, 281

Gandá Dád-kí-bastí s.
(*Multán*)

λ	29 47 11·36
L	71 25 36·17

No. 389

Gandhí Flag,
(*Lahor*) On house.

λ	31 6 33
L	74 6 24

No. 332

Gelehwálá s.
(*Multán*) 0·13 of a mile N.W. by W. of village so called and about 0·12 of a mile N.E. by E. of Chandarwálá.

λ	29 45 22·98
L	71 29 3·05

No. 384

Ghallú, XXIV.
(*Vide page 6—H.*)

λ	29 40 58·76
L	72 32 49·56
H	511
h	20

No. 30

Name of station, district, description, co-ordinates &c.

Ghauswálá Khú s.
(*Multán*) Also called Chak s. About 0·58 of a mile N.E. by E. of Chak village.

	°	′	″
λ	29	56	43·09
L	71	22	35·61

No. 405

Ghazíwálá Khú s.
(*Multán*) 0.17 of a mile N.E. of village so colled; mauza Kundí, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29	32	57·69
L	71	36	19·19

No. 367

Ghazíwattá No. 1. s.
(*Multán*)

λ	29	52	1·94
L	71	21	39·01

No. 398

Ghazíwattá No. 2. s.
(*Multán*) On canal bank.

λ	29	51	20·23
L	71	19	57·41

No. 399

Ghelan s.
(*Lahor*) On top of Amír Nirwái's house in village; mauza Ghelan, thánah and tahsíl Chúnián, sub-division district Kasúr. Marked by a platform with ⊙ inscribed thereon.

λ	30	51	32·46
L	74	4	42·42

No. 312

Gidárvái s.
(*Ferozpúr*) On turret of Kánha Baniá's house in village; mauza Gidárvái, chaukí Kot Bhái, thánah and tahsíl Mukatsar. Marked by a platform with ⊙ inscribed thereon.

λ	30	11	54·55
L	74	42	27·65

No. 235

Godrí, XIV.
(*Vide page* 5—*H.*)

λ	29	25	2·00
L	71	42	51·31
H	415		
h	34		

No. 40

Golehwálá s.
(*Faridkot*) On Sáhib Sing's house, about the centre of village so called.

λ	30	47	14·71
L	74	44	35·65

No. 163

Golehwálá s. No. 2.
(*Faridkot*) On Chet Sing Lambardár's house in village.

λ	30	47	17·09
L	74	44	32·83

Name of station, district, description, co-ordinates &c.

Gosain, XIII.
(*Vide page* 4—*H.*)

	°	′	″
λ	29	16	28·55
L	71	38	5·33
H	404·46		
h	20		

No. 41

Got Káim Raís Fort,
(*Bháwalpúr*) Flag on turret over doorway.

λ	29	41	3·9
L	72	27	35·7

No. 140

Gúghá s.
(*Ferozpúr*) On top of Mullá Zamíndár's house; mauza Gúghá, chaukí Kot Bhái, thánah and tahsíl Mukatsar. Marked by a platform with ⊙ inscribed thereon.

λ	30	14	39·84
L	74	37	8·71

No. 234

Gulábewálá House.
(*Ferozpúr*) Flag on Guláb Sing Lambardár's house.

λ	30	33	37·2
L	74	31	9·3

Nos. 62, 63

Gurjá s.
(*Muzaffargarh*)

λ	30	5	7·05
L	71	18	39·38

No. 430

Gurú Harsahái s.
(*Ferozpúr*) On one of the 2 turrets of high paká house of Gurú Guláb Sing, Sodi Jagírdár, in large village so called. A mark-stone with centrical dot imbedded in the roof defines the station.

λ	30	42	11·36
L	74	26	56·11

No. 290

Gurúsar House.
(*Ferozpúr*) Flag on Budhu carpenter's house in village.

λ	30	16	27·7
L	74	37	55·2

Harí Sháh Tomb No. 1,
(*Multán*) Kalas of dome.

λ	29	26	59·7
L	71	40	24·7

Nos. 365, 366

Harí Sháh Tomb No. 2,
(*Multán*) Spire of dome.

λ	29	28	3·8
L	71	41	23·0

No. 486

Hasan Dariá Tomb,
(*Bháwalpúr*) Spire near Uch.

λ	29	14	14·6
L	71	7	12·1

No. 476

Name of station, district, description, co-ordinates &c.

Hásilpúr House.
(*Bháwalpúr*) Flag on Lakhpat Rái's house.

	°	′	″
λ	29	42	55·0
L	72	35	37·8

No. 138

Hatejí, X.
(*Vide page* 4—*H.*)

λ	29	22	2·40
L	71	19	56·13
H	379		
h	28		

No. 44

Hosnár House.
(*Ferozpúr*) Flag on Panjává Sing Baniá's house in village.

λ	30	13	32·7
L	74	40	42·4

Nos. 255, 256

Jahánwálá s.
(*Bháwalpúr*) On a high sand hill S.S.E. of Sangálá village; zamíndárí Sangálá, kárdárí Narangáwáh. Marked by a peg driven in and covered up for protection.

λ	29	19	43·29
L	71	37	46·71

No. 469

Jalá s.
(*Multán*) On the bastion of an old fort in village; mauza Jalá, thánah and tahsíl Mailsí. Marked by a platform 3 feet high and 4 feet square and covered up for protection.

λ	29	43	4·77
L	72	10	40·76

No. 351

Jalálábád s.
(*Multán*) About 0·43 of a mile N.N.W. of village so called.

λ	30	8	38·88
L	71	23	23·42

No. 425

Jandwálá House.
(*Sarsá*) Flag on Chain Lambardár's house.

λ	30	2	30·0
L	74	2	24·3

No. 274

Jánpúr House.
(*Bháwalpúr*) Flag on Thákur Missar's house.

λ	29	1	2·1
L	70	51	33·1

No. 151

Jánwálá Flag.
(*Bháwalpúr*)

λ	29	19	42
L	71	23	34

Jhajjal Tower,
(*Bháwalpúr*) On sand hill.

λ	30	11	21·1
L	73	58	42·0

Nos. 120, 121

Name of station, district, description, co-ordinates &c.

Jhakar s.
(*Multán*)

	°	′	″
λ	29	46	27·59
L	71	28	31·53

No. 386

Jhambherá, XXXIII.
(*Vide page 7—H.*)

λ	30	5	59·27
L	73	51	43·48
H	630		
h	23		

No. 14

Jhambherá Referring Mark.
(*Bháwalpúr*)

λ	30	8	12·77
L	73	51	43·49

Nos. 122, 123

Jhandá Phidá s.
(*Faridkot*) On roof of Guláb Sing Zamíndár's house in centre of village.

λ	30	34	54·02
L	74	43	40·98

No. 194

Jhandwálá, XXXV.
(*Vide page 8—H.*)

λ	30	13	4·35
L	74	2	53·90
H	626		
h	20		

No. 12

Jhandwálá Khú s.
(*Multán*)

λ	29	48	51·02
L	71	23	37·97

No. 393

Jhok, XII.
(*Vide pag 4—H.*)

λ	29	24	47·33
L	71	31	41·10
H	396		
h	28		

No. 42

Jhúlán, IV.
(*Vide page 7—H.*)

λ	30	3	21·90
L	73	16	44·25
H	534		
h	20		

No. 21

Jhúmbá Tower.
(*Ferozpúr*) Flag on Jang Sing's tower.

λ	30	9	33·2
L	74	49	2·6

No. 257

Name of station, district, description, co-ordinates &c.

Jíwan, XXVI.
(*Vide page 6—H.*)

	°	′	″
λ	29	46	16·99
L	72	43	22·82
H	494		
h	25		

No. 28

Joáríwálá, XLII.
(*Vide page 8—H.*)

λ	30	35	31·77
L	74	27	19·74
H	659		
h	29		

No. 5

Johárki, II. of the Jogí-Tílá Series.
(*Bikanír*) On a sand ridge, about 2.5 miles W. by S. of the little village of Dhanúr; thánah Mirizawála, kardari Bhatír. Denoted by a perforated masonry pillar with a markstone let into the floor of the passage at the ground level.

λ	29	56	42·38
L	73	31	8·01
H	577		
h	11		

No. 19

Josar, XXVIII.
(*Vide page 6—H.*)

λ	29	50	42·52
L	72	53	4·44
H	502		
h	20		

No. 26

Kabar Buchá House.
(*Ferozpúr*) Flag on highest house.

λ	30	46	49·5
L	74	51	46·1

Nos. 174, 175

Kabírwálá, XV.
(*Vide page 5—H.*)

λ	29	17	30·05
L	71	50	22·51
H	421		
h	23		

No. 39

Kaimsir, XIX.
(*Vide page 5—H.*)

λ	29	24	42·14
L	72	10	45·04
H	461		
h	11		

No. 35

Káimwálá Khú s.
(*Multán*)

λ	29	49	36·24
L	71	22	36·59

No. 395

Name of station, district, description, co-ordinates &c.

Kamál Kherá House.
(*Sarsá*) Flag on Manglá Lambardár's house.

	°	′	″
λ	30	2	43·1
L	73	59	38·6

No. 282

Kamálpúr s.
(*Multán*) 0·27 of a mile N. of village so called; mauza Kamálpúr, thánah Kihror, tahsíl Mailsí. Marked by a paká pillar and annulus 8 feet high with ⊙ inscribed thereon and covered up for protection.

λ	29	38	6·99
L	71	45	41·05

No. 342

Kanaíwálá Tower.
(*Ferozpúr*) Flag on Sukhá Sing's tower.

λ	30	37	28·7
L	74	33	33·1

Nos. 64, 65

Kandá, XXI.
(*Vide page 5—H.*)

λ	29	27	41·52
L	72	22	12·29
H	478		
h	20		

No. 33

Kandání, I.
(*Vide page 3—H.*)

λ	28	49	38·62
L	70	49	32·44
H_s	300·03		
h	26		

No. 53

Kanganpurá s.
(*Lahor*) On turret of a deserted thánah in village; mauza Kanganpurá, thánah and tahsíl Chúnián, sub-division district Kasúr. Marked by a platform with ⊙ inscribed thereon.

λ	30	46	9·83
L	74	10	3·64

No. 309

Karníkherá, XXXVI.
(*Vide page 8—H.*)

λ	30	21	33·14
L	74	1	10·71
H	609		
h	20		

No. 11

Kasbá s.
(*Multán*)

λ	30	1	21·24
L	71	26	40·50

No. 415

Kásimká House.
(*Bháwalpúr*) Flag on Kárdár's house.

λ	30	0	50·3
L	73	5	24·3

No. 127

Name of station, district, description, co-ordinates &c.

Kasúr s.
(*Lahor*) On top of the large dome of building used as kachahrí and residence of the Asst. Commissioner and about 1 mile S.E. of town. A trigonometrical mark inscribed on the top defines the station.

	° ′ ″
λ	31 6 46·83
L	74 30 30·96

No. 295

Kásúwálá s.
(*Ferozpúr*) On Bálah Lambardár's house, W. side of village so called.

λ	30 51 26·42
L	74 42 40·19

No. 166

Katerá, XXXVII.
(*Vide page* 8—H.)

λ	30 17 9·02
L	74 10 48·93
H	649
h	25

No. 10

Katgarh s.
(*Multán*) About 0·50 of a mile from the village so called and about 0·39 of a mile N.N.W. of Trijunction Pillar; mauza Katgarh, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29 37 53·12
L	71 33 53·73

No. 373

Kauní s.
(*Ferozpúr*) On roof of Duni Chand Baniá's house in centre of village.

λ	30 24 2·74
L	74 42 16·60

No. 200

Kauráwálá s.
(*Bháwalpúr*) On a sand hill in the Thal about 3 miles E. of Hotedálá village. Marked by a paká masonry platform 2·5 feet high with ⊙ inscribed thereon and covered up for protection.

λ	29 19 21·66
L	71 43 6·43

No. 470

Kauríwálá Khú s.
(*Multán*)

λ	30 4 56·57
L	71 27 33·96

No. 419

Khái Mosque,
(*Bháwalpúr*) Flag.

λ	30 1 50·4
L	73 10 56·9

No. 126

Khái s.
(*Ferozpúr*) On Suján Bráhman's house in large village so called. A stone having ⊙ inscribed on it and imbedded in the roof defines the station.

λ	30 54 22·69
L	74 35 29·88

Nos. 302, 303

Name of station, district, description, co-ordinates &c.

Khairpúr Bench-Mark.
(*Bháwalpúr*) Stone B.M. imbedded opposite to, and N. of the town of Khairpúr, about 250 yards in a direct line from the Maulví's Khángáh, which latter bears 150° N.

	° ′ ″
λ	29 35 9·37
L	72 16 53·44
H_s	418·75

No. 142

Khairpúr No. 1. s.
(*Bháwalpúr*)

λ	29 34 55·39
L	72 17 1·13

No. 141

Khairpúr No. 2. s.
(*Multán*) About 0·44 of a mile S. by E. of village so called and about 0·70 of a mile N.E. by N. of Tibbí village.

λ	30 9 51·66
L	71 25 50·72

No. 424

Khánbelá, II.
(*Vide page* 3—H.)

λ	28 59 14·18
L	70 46 49·13
H_s	309·71
h	26

No. 52

Khánbelá Tomb.
(*Bháwalpúr*) Dome of Sultán Mahmúd's tomb.

λ	28 57 39·6
L	70 46 53·4

Nos. 153, 154

Khángáh House.
(*Bháwalpúr*) Flag on Mián Amádár Fakír's house.

λ	29 18 51·2
L	71 35 5·5

No. 145

Khángarh Fort,
(*Muzaffargarh*) Flag on highest turret of a Baniá's haveli.

λ	29 54 56·3
L	71 12 11·1

No. 439

Khánpúr Dome.
(*Multán*) Of Kází-ká-Rauzá.

λ	29 58 28·4
L	71 20 20·2

Nos. 440, 441

Khánpúr s.
(*Multán*) On top of Adú Mal Baniá's house in village; mauza Khánpúr, thánah and tahsíl Mailsí. Marked by a platform 6 in. high and 4 ft. square and covered up for protection.

λ	29 47 49·29
L	72 16 7·34

No. 354

Name of station, district, description, co-ordinates &c.

Khárá, XLV.
(*Vide page* 9—H.)

	° ′ ″
λ	30 32 2·63
L	74 45 21·07
H	708
h	26

No. 2

Khárá s.
(*Faridkot*)

λ	30 32 0·08
L	74 45 15·47

No. 193

Kharak s.
(*Multán*) On a high sand hill, 0·33 of a mile S. E. by E. of village so called; mauza Kharak, thánah Kihror, tahsíl Mailsí. Marked by a peg driven in and covered up for protection.

λ	29 33 35·82
L	71 52 39·78

No. 339

Kharal s.
(*Multán*) About 100 paces from a well so called; mauza Hamídpúr, thánah Kihror, tahsíl Mailsí. Marked by a paká pillar and annulus 9 ft. high with ⊙ inscribed thereon and covered up for protection.

λ	29 37 27·70
L	71 50 0·27

No. 340

Kháreпár s.
(*Lahor*) On Ahmad Lambardár's house in village; mauza Kháreпár, thánah, tahsíl and sub-division district Kasúr. A mark-stone with ⊙ inscribed thereon, defines the station.

λ	31 0 3·31
L	74 29 37·02

No. 294

Khiuwálá House.
(*Sarsá*) Flag on Dáná Lambardár's house.

λ	30 14 43·1
L	74 3 17·2

Nos. 112, 113

Khokar Mosque.
(*Multán*)

λ	30 0 44·9
L	71 24 52·5

No. 443

Khokar Village,
(*Ferozpúr*) Flag on highest house.

λ	30 28 56
L	74 43 12

Khoráwálá Khú s.
(*Multán*)

λ	29 50 56·99
L	71 22 5·14

No. 396

Name of station, district, description, co-ordinates &c.

Khúdián s.
(*Lahor*) On top of Dewá Sing Kalár's house in village; mauza Khúdián, thánah and tahsíl Chúnián, sub-division district Kasúr. Marked by a platform with ⊙ inscribed thereon.

	° ′ ″
λ	30 59 9·45
L	74 18 48·95

No. 293

Kihror s.
(*Multán*) On a turret of Saiyid Fathi Sháh's house in town; thánah Kihror, tahsíl Mailsí. Marked by a platform 6 in. high and 4 ft. square with ⊙ inscribed thereon and covered up for protection.

λ	29 37 30·21
L	71 57 20·67

No. 337

Kihror Tomb No. 1.
(*Multán*) Dome of Sultán Alí Sarwar's tomb.

λ	29 37 20·2
L	71 57 24·5

Nos. 358, 359

Kihror Tomb No. 2,
(*Multán*) Muhammad Akram's.

λ	29 37 22·7
L	71 57 6·0

Kilá Dípsingwálá s.
(*Faridkot*) On N.W. bastion of fort alongside the village so called. A brick having ⊙ inscribed on it and imbedded in the roof defines the station.

λ	30 44 35·88
L	74 31 9·80

Nos. 297, 298

Kingárá s.
(*Sarsá*) On a sand hill about 200 yds. W. of village so called; mauza Kingárá, chaukí Malaut, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30 9 35·33
L	74 36 19·40

No. 233

Kolanwálí s.
(*Sarsá*) On a high sand hill about 1·50 miles W. of village so called; mauza Kolanwálí, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30 6 46·81
L	74 29 37·18

No. 222

Korái House.
(*Ferozpúr*) Flag on Hukm Baniá's house in village.

λ	30 15 48·2
L	74 34 9·1

No. 249

Name of station, district, description, co-ordinates &c.

Kot Bhái s.
(*Ferozpúr*) On roof of bastion of Gurú Anúp Sing's old fort.

	° ′ ″
λ	30 15 59·60
L	74 44 23·74

No. 236

Kot Kapúrá s.
(*Faridkot*) On tower in fort E. of northern gateway and town.

λ	30 34 52·07
L	74 52 19·25

No. 156

Kotlí Madarsá,
(*Lahor*) Flag.

λ	31 5 59·6
L	74 19 4·9

Nos. 319, 320

Kúbáwálá Khú s.
(*Multán*)

λ	29 58 51·29
L	71 22 4·30

No. 408

Labana House.
(*Ferozpúr*) Flag on Gámá Lambardár's house.

λ	30 34 52·3
L	74 35 56·8

Nos. 66, 67

Labrá s.
(*Multán*) About 0·18 of a mile N.E. of village so called.

λ	30 3 14·80
L	71 27 17·45

No. 417

Ládimsir, XVII.
(*Vide page 5—H.*)

λ	29 21 41·58
L	72 1 46·89
H	468
h	10

No. 37

Lahorí s.
(*Multán*) Near the village so called; mauza Lahorí, thánah and tahsíl Shujá-ábád. Marked by a pillar and annulus 3 ft. high with ⊙ inscribed thereon and covered up for protection.

λ	29 44 8·17
L	71 28 30·52

No. 382

Lakarwálá House,
(*Sarsá*) Flag on Bágha Zamíndár's house in village.

λ	30 19 31·3
L	74 28 55·0

Nos. 260, 261

Lakhíwálá Sand Hill,
(*Ferozpúr*) Flag.

λ	30 26 15
L	74 22 27

Nos. 86, 87

Name of station, district, description, co-ordinates &c.

Lakhmíráná House,
(*Ferozpúr*) Flag in village.

	° ′ ″
λ	30 20 36
L	74 27 40

Nos. 241, 242

Lálkhán-kí-bastí s.
(*Bháwalpúr*) N. of village. Marked by a platform 7·5 ft. high with ⊙ engraved thereon.

λ	29 14 57·34
L	71 0 27·75

No. 450

Lálsahárá village,
(*Bháwalpúr*) Flag.

λ	29 27 58
L	71 59 36

Lálúwálí, LXXXIV.
(*Vide page 3—H.*)

λ	28 43 19·36
L	70 41 59·15
H_s	296·30
h	31

No. 55

Lamochar Flag,
(*Ferozpúr*) In village.

λ	30 34 22
L	74 12 22

Nos. 325, 326

Landá s.
(*Sarsá*) On a sand hill about 2 miles S.W. of Khuián and 1·50 miles S. of Díwán Kherá village; mauza Díwán Kherá, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30 5 42·60
L	74 4 27·34

No. 226

Langrá s.
(*Multán*) About 0.28 of a mile S.E. of village so called.

λ	29 52 44·04
L	71 18 10·39

No. 433

Lodhran Dome.
(*Multán*)

λ	29 32 29·5
L	71 40 39·6

Nos. 361, 362

Lodhran s.
(*Multán*) On top of a Baniá's house in village; mauza, thánah and tahsíl Lodhran. Marked by a platform 6 in. high and 4 ft. square with ⊙ inscribed thereon and covered up for protection.

λ	29 32 25·41
L	71 40 39·17

No. 345

Name of station, district, description, co-ordinates &c.

Lohárú s.
(*Bháwalpúr*) On a high sand hill 0·33 of a mile S. of village so called; zamíndárí Málkání, kárdárí Ahmadpúr. Marked by a peg driven in and covered up for protection.

	°	′	″
λ	29	9	53·71
L	71	13	20·08

No. 456

Lúndá House,
(*Ferozpúr*) Flag in village.

λ	30	18	29
L	74	35	52

Nos. 247, 248

Lundá s.
(*Bháwalpúr*) On a small sand hill in the Thal, about 2 miles N.E. of Paberwálí fort; kárdárí Khánwáh. Marked by a peg driven in and covered up for protection.

λ	29	12	14·38
L	71	38	14·33

No. 466

Lundí Bhít s.
(*Bháwalpúr*) On a sand hill in the Thal. Marked by a peg driven in and covered up for protection.

λ	29	7	13·40
L	71	28	20·10

No. 462

Lurúwálá s.
(*Bháwalpúr*) On a high sand hill in the Thal. Marked by a peg driven in and covered up for protection.

λ	29	8	3·96
L	71	37	50·15

No. 465

Machíwárá s.
(*Ferozpúr*) On Kháná Lambardár's house in village; tahsíl Mukatsar. A brick having ⊙ inscribed on it and imbedded in the roof, defines the station.

λ	30	49	27·18
L	74	33	42·15

No. 299

Madank Tower.
(*Faridkot*) Flag on highest of three towers E. of and in village.

λ	30	27	23·3
L	74	47	38·7

Nos. 211, 212

Madersá Temple,
(*Ferozpúr*) Centre dome.

λ	30	28	8·4
L	74	24	23·5

Nos. 82, 83

Madi Shahíd s.
(*Bháwalpúr*) On a high and extensive mound formed of the ruins of an old fort, and now a well known grave-yard; zamíndárí Madi Shahíd, Kárdárí Ahmadpúr. Marked by a peg driven in and covered up for protection.

λ	29	12	32·45
L	71	16	54·32

No. 457

Name of station, district, description, co-ordinates &c.

Madír House,
(*Ferozpúr*) Flag on highest house in village.

	°	′	″
λ	30	16	21
L	74	40	32

No. 252

Magrejá, III.
(*Vide page 3—H.*)

λ	28	57	24·70
L	70	56	35·80
H_s	306·84		
h	31		

No. 51

Mahmúdpúr s.
(*Multán*)

λ	30	1	36·92
L	71	25	1·28

No. 414

Mailsí s.
(*Multán*) On top of a Bráhman's house in village; mauza, thánah and tahsíl Mailsí. Marked by a platform 6 in. high and 4 ft. square and covered up for protection.

λ	29	47	55·66
L	72	13	7·58

No. 353

Makhanbelá s.
(*Bháwalpúr*) N. W. of village. Marked by a platform 6 ft. high.

λ	29	18	13·07
L	71	2	26·80

No. 451

Malan s.
(*Ferozpúr*) On roof of Gurú Albel Sing's paká house in centre of village and near the domed tombs of Kán Sing and Abhá Rám.

λ	30	24	7·09
L	74	46	28·41

No. 201

Malaut s.
(*Sarsá*) On a bastion of an old fort quite contiguous to the new village so called; mauza and chaukí Malaut, thánah Abohar, tahsíl and subdivision district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30	12	47·15
L	74	31	15·24

No. 220

Malkáná House,
(*Bháwalpúr*) Flag on large paká house on E. side of village.

λ	29	15	1·8
L	71	16	25·7

No. 148

Malúkvahán Mosque,
(*Multán*) Centre dome.

λ	29	49	19·6
L	72	18	33·8

No. 355

Name of station, district, description, co-ordinates &c.

Malwal s.
(*Ferozpúr*) On S. E. bastion of old fort.

	°	′	″
λ	30	54	18·29
L	74	43	11·05

No. 168

Mamdot s.
(*Ferozpúr*) On W. bastion of an old fort enclosing the ruinous town of that name; mauza and iláká Mamdot, thánah and tahsíl Ferozpúr. A mark-stone having ⊙ inscribed on it and imbedded in the roof, defines the station.

λ	30	52	17·54
L	74	27	26·05

No. 292

Mámúdeh, I.
(*Vide page 7—H.*)

λ	29	55	25·19
L	73	20	59·48
H	569		
h	14		

No. 20

Mandíwálá s.
(*Bháwalpúr*) On a sand hill in the Thal E. of Sangrásí well. Marked by a peg driven in and covered up for protection.

λ	29	7	27·32
L	71	34	4·85

No. 464

Mandresa, XXX.
(*Vide page 7—H.*)

λ	29	55	9·17
L	73	1	55·60
H	512		
h	25		

No. 24

Mandresa Referring Mark.
(*Bháwalpúr*) On ruined tomb near village.

λ	29	55	8·05
L	73	3	38·89

Nos. 128, 129

Marí No. 1 s.
(*Multán*)

λ	29	45	14·98
L	71	27	47·06

No. 385

Marí No. 2 s.
(*Multán*)

λ	29	47	30·11
L	71	27	1·95

No. 388

Marí-ká-mauza s.
(*Multán*)

λ	29	48	24·42
L	71	25	55·46

No. 390

Name of station, district, description, co-ordinates &c.

Márishonkshá House,
(*Bhâwalpúr*) Flag on Fakír's house.

	°	′	″
λ	29	51	15·7
L	72	56	46·4

Nos. 130, 131

Marrí s.
(*Muzaffargarh*) On turret of Bhawání Lambardár's paká building in village; thánah Jatoí, tahsíl Sítpúr. Marked by a masonry pillar 6 in. high with ⊙ engraved thereon.

λ	29	18	10·31
L	70	56	23·65

No. 563 (of Great Indus Series) *vide* Synoptical Vol. of that series page 64—D.

Masákothá s.
(*Multán*) On top of a Bania's house in village; mauza Masákothá, thánah Kihror, tahsíl Mailsí. Marked by a platform 6 in. high and 4 ft. square with ⊙ inscribed thereon and covered up for protection.

λ	29	35	48·13
L	72	3	21·67

No. 336

Matelí House,
(*Bíkáner*) Flag on Iláhí Bakhsh Fakír's house.

λ	29	56	18·9
L	73	44	44·1

Nos. 287, 288

Maujípúr s.
(*Multán*)

λ	29	55	17·14
L	71	17	0·87

No. 435

Maur Dharmsálá,
(*Faridkot*) Flag.

λ	30	30	16·6
L	74	47	18·7

Nos. 203, 204

Maur House,
(*Ferozpúr*) Flag on Dhúm Sing's house.

λ	30	29	35·8
L	74	27	46·8

Nos. 74, 75

Maur Tomb,
(*Faridkot*) Spire of Pír Sháh's tomb.

λ	30	30	17·8
L	74	47	19·4

Nos. 205, 206

Mehrú s.
(*Bhâwalpúr*) On a high sand hill about 0·31 of a mile S. E. of Mehrú-ká-got village; zamíndárí Mehrú-ká-got, kárdárí Khánwáh. Marked by a peg driven in and covered up for protection.

λ	29	16	8·32
L	71	34	52·51

No. 467

Name of station, district, description, co-ordinates &c.

Miráliwán s.
(*Multán*) Also called Jíwanwálá Khú s.

	°	′	″
λ	29	53	52·63
L	71	21	41·61

No. 401

Miánpúr s.
(*Multán*) A few paces from the village so called; mauza Miánpúr, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29	39	7·71
L	71	34	33·96

No. 374

Mídhá House,
(*Sarsá*) Flag in village.

λ	30	17	40
L	74	23	46

Nos. 268, 269

Mirzáwálá s.
(*Bíkáner*) On gateway of kachá fort of the same name; kárdárí Mirzáwálá. Marked by a small paká platform with ⊙ inscribed thereon.

λ	29	58	17·86
L	73	47	22·67

No. 231

Mithan-kí-bastí s.
(*Multán*)

λ	29	50	21·11
L	71	21	15·91

No. 397

Mocharwálá s.
(*Multán*) In Jungle Sircar, about 0·75 of a mile from Sultán Mochar's well; thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29	40	20·97
L	71	31	33·27

No. 377

Mohar Flag.
(*Bhâwalpúr*)

λ	29	52	6
L	72	52	33

Mokal s.
(*Lahor*) On Sardár Surjan Sing's high paká building; mauza Mokal, thánah and tahsíl Chúnián, sub-division district Kasúr. Marked by a platform with ⊙ inscribed thereon.

λ	30	46	16·38
L	74	16	1·33

No. 291

Moní-Dhai, VIII.
(*Vide page 7—H*)

λ	30	13	19·98
L	73	43	23·39
H	593		
h	30		

No. 15

Name of station, district, description, co-ordinates &c.

Moráhar Village,
(*Ferozpúr*) Flag on highest house.

	°	′	″
λ	30	32	57
L	74	43	16

Mosque No. 1,
(*Bhâwalpúr*) In wilderness.

λ	30	3	5·4
L	73	23	46·6

No. 125

Mosque No. 2,
(*Bhâwalpúr*) In wilderness.

λ	30	3	5
L	73	23	38

Mubárikpúr Fort,
(*Bhâwalpúr*) Flag on centre bastion of S. face of fort.

λ	29	46	33·9
L	72	49	32·5

Nos. 135, 136

Múkantsingwálá, XLIII.
(*Vide page 9—H.*)

λ	30	28	16·85
L	74	35	29·51
H	698		
h	25		

No. 4

Mukatsar Gurúdwárá,
(*Ferozpúr*) Kalas of Tambú Sáhib's dome.

λ	30	28	19·2
L	74	33	26·9

Nos. 68, 69

Mukatsar Temple No. 1,
(*Ferozpúr*) Spire.

λ	30	28	24·7
L	74	33	20·8

Nos. 70, 71

Mukatsar Temple No. 2,
(*Ferozpúr*) Spire.

λ	30	28	24·2
L	74	33	17·4

Nos. 78, 79

Mulá-ká-Váhí s.
(*Multán*) In Jungle Sircar and about 0·66 of a mile N. E. of Trijunction Pillar; mauza Mulá-ká-Váhí, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29	39	9·81
L	71	32	47·97

No. 375

Múlápúr Temple,
(*Lahor*) Kalas.

λ	30	55	31·6
L	74	6	58·4

No. 331

Name of station, district, description, co-ordinates &c.

Múláwálá House,
(*Sarsá*) Flag on highest house in village.

	° ′ ″
λ	30 20 13
L	74 19 41

Nos. 266, 267

Mulláwálá Khú s.
(*Multán*)

λ	29 49 14·27
L	71 24 59·63

No. 392

Multán City Dome.
(*Multán*) In date-tope N. of Cantonments.

λ	30 13 4·8
L	71 28 45·7

Nos. 444, 445

Multán Flag-Staff.
(*Multán*) In Artillery Lines.

λ	30 11 26·3
L	71 27 57·2

Multán Fort.
(*Multán*) Large dome of Bháwal Hak's tomb in fort.

λ	30 11 57·3
L	71 30 46·6

Nos. 447, 448

Multán s.
(*Multán*) In Cantonments; about 0·58 of a mile E. S. E. of Kásimmelá.

λ	30 11 21·07
L	71 27 20·43

No. 446

Murád Khairwálí s.
(*Bháwalpúr*) On a high sand hill; zamíndárí Murád Khairwálí, kárdárí Pírwálí. Marked by a peg driven in and covered up for protection.

λ	29 12 50·56
L	71 21 43·61

No. 459

Nandgarh House,
(*Ferozpúr*) Flag on Guláb Dás Fakír's house.

λ	30 25 17·2
L	74 22 39·3

Nos. 84, 85

Nandlál, VIII.
(*Vide page 4—H.*)

λ	29 18 54·27
L	71 9 26·08
H	364
h	29

No. 46

Nathal, XXIII.
(*Vide page 6—H.*)

λ	29 32 13·51
L	72 31 40·13
H	494
h	22

No. 31

Name of station, district, description, co-ordinates &c.

Naurangsháh s.
(*Multán*) Near a well so called and about 0·48 of a mile S. S. E. of Salsadar village; mauza Salsadar, thánah and tahsíl Lodhran: Marked by a peg driven in and covered up for protection.

	° ′ ″
λ	29 34 54·32
L	71 36 7·78

No. 369

Nayá Pahálá s.
(*Multán*)

λ	29 58 54·95
L	71 23 57·32

No. 409

Nuníárwálí s.
(*Bháwalpúr*) On a mound formed of the ruins of a salt manufactory in village so called; kárdárí Narangáwáh. Marked by a paká masonry platform 2·5 ft. high with ⊙ inscribed thereon and covered up for protection.

λ	29 22 31·32
L	71 38 57·28

No. 471

Núr Muhammad Bench-Mark.
(*Bháwalpúr*) Stone B.M. imbedded near Núr Muhammad-kí-got across the road opposite an old grave-yard called Rajan Kathar-kí-Kabaristán, about 1 mile N.E. of the village of Sháh Muhammad-kí-got.

λ	29 30 16·79
L	72 5 32·70
H_s	407·37

Núrkanch, IX.
(*Vide page 4—H.*)

λ	29 13 55·15
L	71 18 38·02
H_s	348·89
h	30

No. 45

Núrpúr s.
(*Ferozpúr*) On Máná Baniá's house in centre of village.

λ	30 52 31·00
L	74 40 43·41

No. 184

Núrwálí Flag.
(*Bháwalpúr*)

λ	29 10 3
L	70 56 21

Paká s.
(*Bháwalpúr*) On a small sand hill in the Thal, about 0·50 of a mile W. of well so called; kárdárí Khánwáh. Marked by a peg driven in and covered up for protection.

λ	29 16 45·70
L	71 39 28·14

No. 468

Name of station, district, description, co-ordinates &c.

Pákhí Village,
(*Faridkot*) Flag on highest house.

	° ′ ″
λ	30 45 14
L	74 48 2

Pakí s.
(*Sarsá*) On a small sand hill W. of village so called; mauza Pakí, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30 9 43·27
L	74 23 28·58

No. 221

Páníwálá House,
(*Sarsá*) Flag on Chokhá Zamíndár's house.

λ	30 0 17·1
L	74 0 17·1

Nos. 278, 279

Panjává s.
(*Sarsá*) On a sand hill W. of village so called; thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform 2 ft. high with ⊙ inscribed thereon.

λ	30 5 39·42
L	73 59 28·23

No. 228

Paphrá, IV.
(*Vide page 3—H.*)

λ	29 5 49·37
L	70 52 13·00
H_s	316·39
h	25

No. 50

Párámal s.
(*Multán*) About a mile E. of the well so called; mauza Párámal, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29 41 52·98
L	71 31 48·95

No. 378

Patartalá Sand Hill,
(*Sarsá*) Flag.

λ	30 20 57
L	74 11 2

Nos. 100, 101

Pathánwálá s.
(*Multán*) On bank of canal near a well so called; mauza Miánpúr, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29 37 49·52
L	71 35 45·86

No. 372

Paulíwálá s.
(*Multán*) Near a well so called and 0·58 of a mile S. of Trijunction Pillar; mauza Kálúwálá, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29 36 25·78
L	71 37 2·78

No. 370

Name of station, district, description, co-ordinates &c.

auntiá s.
(*Multán*) About 0·49 of a mile S.S.E. of Ganjí astí.

	°	′	″
λ	29	54	13·48
L	71	18	26·79

No. 432

iáráná s.
(*Ferozpúr*) On roof of room over doorway of haukí on Grand Trunk Road near village so called.

λ	30	53	4·81
L	74	45	25·41

No. 167

ípalwálá Khú s.
(*Multán*)

λ	29	46	18·07
L	71	26	38·80

No. 387

ípalwálá s.
(*Multán*) Near a well so called; mauza Lahorí, thánah and tahsíl Shujá-ábád. Marked by a peg driven in and covered up for protection.

λ	29	43	22·09
L	71	30	12·30

No. 380

Pirhár, VII.
(*Vide page 4—H.*)

λ	29	10	34·87
L	71	10	8·66
H_s	348·20		
h	12		

No. 47

Rainawálá s.
(*Faridkot*) On top of thánah in village. A brick having ⊙ inscribed on it and imbedded in the roof, defines the station.

λ	30	43	31·67
L	74	44	40·30

Rainawálá s.
(*Faridkot*) On Rájá's custom house, on E. side of village so called.

λ	30	43	31·69
I	74	44	40·25

No. 161

Ráipúr s.
(*Sarsá*) On a sand hill, 0·75 of a mile S.E. of village so called and about 2 miles W. of large village of Kukriánwálí; mauza Ráipúr, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30	5	57·29
L	74	20	8·13

No. 223

Rajanpúr s.
(*Multán*) On top of Muhammad Sháh Lambardár's house in village; mauza Rajanpúr, thánah and tahsíl Lodhran. Marked by a platform 6 in. high and 4 ft. square with ⊙ inscribed thereon and covered up for protection.

λ	29	35	3·36
L	71	43	16·56

No. 343

Name of station, district, description, co-ordinates &c.

Rájápúr s.
(*Multán*)

	°	′	″
λ	30	8	8·09
L	71	21	54·05

No. 427

Rájúwálá Flag,
(*Faridkot*) On Búrá Lambardár's house.

λ	30	46	8·5
L	74	45	15·3

Ramiáná Flag,
(*Faridkot*) On Gurú Gulább Sing's house in village.

λ	30	25	2·7
L	74	49	34·0

Rámkalí s.
(*Bhawalpúr*) On turret of an old paká building; zamíndárí Rámkalí, kárdárí Uch. Marked by a pillar 9 in. high with ⊙ inscribed thereon and covered up for protection.

λ	29	9	1·28
L	71	4	0·42

No. 453

Rámnagar Fort,
(*Bíkáner*) Flag on gateway.

λ	29	55	35·1
L	73	53	52·2

Nos. 285, 286

Rámpurá House.
(*Sarsá*) Also called Keríwálá; flag on Lachman Lambardár's house.

λ	30	22	42·5
L	74	4	59·6

Nos. 104, 105

Ráthá Ther s.
(*Sarsá*) On top of Baniá's house in village; mauza Ráthá Ther, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30	14	40·13
L	74	18	52·86

Nos. 264, 265

Rúkhálá House,
(*Ferozpúr*) Flag in village.

λ	30	18	4
L	74	41	0

No. 251

Rupáná House,
(*Ferozpúr*) Flag in village.

λ	30	24	20
L	74	34	5

Nos. 237, 238

Saiyidwálá House,
(*Ferozpúr*) Flag on Amír Sháh Lambardár's house in village.

λ	30	55	14·7
L	74	44	9·1

Nos. 178, 179

Name of station, district, description, co-ordinates &c.

Salonoán-kí-Khú s.
(*Multán*)

	°	′	″
λ	29	50	2·63
L	71	23	56·89

No. 394

Salsadar s.
(*Multán*) In Jungle Sircar near the well of Chúráwálá and 0·55 of a mile S.W. of Trijunction Pillar; mauza Salsadar, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29	36	37·82
L	71	35	18·75

No. 371

Sálúkhel, VI.
(*Vide page 4—H.*)

λ	29	13	11·00
L	70	59	30·41
H	352		
h	26		

No. 48

Sand Hill s.
(*Multán*) On an isolated range of hills in Jungle Sircar about 2 miles from Sikandarwálá village; thánah and tahsíl Lodhran. Marked by a peg driven in ground.

λ	29	28	33·76
L	71	36	31·45

No. 347

Sangú s.
(*Faridkot*) On the only house standing on N.W. side of deserted village so called.

λ	30	37	10·42
L	74	43	28·49

No. 158

Sanjrání s.
(*Bhawalpúr*) On a high sand hill about 0·75 of a mile N.W. of village so called; zamíndárí Sanjrání, kárdárí Khánwáh. Marked by a peg driven in and covered up for protection.

λ	29	10	54·91
L	71	27	24·81

No. 461

Sarái Flag,
(*Ferozpúr*) Bábá Nának's, in village.

λ	30	30	55·6
L	74	42	38·1

Nos. 207, 208

Sarái Minaret No. 1.
(*Ferozpúr*)

λ	30	30	55·8
L	74	42	38·4

Nos. 58, 59

Sarái Minaret No. 2.
(*Ferozpúr*)

λ	30	30	55·4
L	74	42	38·3

Nos. 60, 61

Name of station, district, description, co-ordinates &c.

Sathirwálá House,
(*Sarsá*) Flag on Gangá Rám Lambardár's house.

	° ′ ″
λ	30 16 11·1
L	74 2 30·4

Nos. 114, 115

Satíwálá Village,
(*Ferozpúr*) Flag on highest house.

λ	30 55 35
L	74 41 12

Serí Pohoran s.
(*Multán*)

λ	30 0 44·06
L	71 24 11·16

No. 412

Serwálá Khú s.
(*Multán*) Also called Khokar s.

λ	30 0 29·03
L	71 25 24·66

No. 413

Sháh Músá Pole,
(*Multán*) Long, near a tomb on a high mound.

λ	29 47 55·2
L	71 25 6·4

Sháh Sahálí Tomb,
(*Multán*) Dome.

λ	29 29 58·7
L	71 42 57·6

Nos. 363, 364

Sháhdínwálá s.
(*Ferozpúr*) On top of a house W. of and in village.

λ	30 56 46·20
L	74 43 1·16

No. 170

Sháhpúr No. 1 s.
(*Multán*) On turret of Ahmad Phul's house; mauza Sháhpúr, thánah Kihror, tahsíl Mailsí. Marked by a platform 6 in. high and 4 ft. square with ⊙ inscribed thereon and covered up for protection.

λ	29 32 12·35
L	71 57 33·35

No. 338

Sháhpúr No. 2 s.
(*Multán*) On ruined bastion of an old fort in village; mauza Sháhpúr, thánah and tahsíl Mailsí. Marked by a paká pillar and annulus 8 ft. high with ⊙ inscribed thereon and covered up for protection.

λ	29 44 33·47
L	72 15 21·83

No. 352

Shahr Farid House,
(*Bháwalpúr*) Flag on Sant Lál Karár's house.

λ	29 49 20·3
L	72 48 33·1

No. 137

Name of station district, description, co-ordinates &c.

Shekhwahán, XXII.
(*Vide page 6—H.*)

	° ′ ″
λ	29 37 55·87
L	72 23 42·81
H	464
h	15

No. 32

Shekhwahán Tomb.
(*Bháwalpúr*) Small new tomb with white dome.

λ	29 38 37·6
L	72 24 23·4

No. 139

Sher Sháh Dome.
(*Multán*)

λ	30 6 7·7
L	71 21 49·3

No. 449

Sher Sháh s.
(*Multán*)

λ	30 6 1·65
L	71 21 21·36

No. 428

Sher Singwálá s.
(*Faridkot*) On Sobhá Sing Lambardár's house, in S.W. corner of village so called.

λ	30 39 53·92
L	74 40 8·75

No. 159

Shujá-ábád s.
(*Multán*)

λ	29 52 59·28
L	71 19 59·33

No. 400

Sikandrábád Havelí,
(*Multán*) Flag on Chaudharí's havelí.

λ	29 58 0·7
L	71 24 8·6

No. 442

Sindhú House,
(*Faridkot*) Flag on Mahir Sing Zamíndár's house.

λ	30 36 39·5
L	74 50 32·7

Nos. 176, 177

Sítpúr s.
(*Muzaffargarh*) On turret of Chandra Bhán Díwán's paká house in town; thánah and tahsíl Sítpúr. Marked by a masonry pillar 9 in. high with ⊙ engraved thereon.

λ	29 14 26·98
L	70 52 58·40

No. 561 (of Great Indus Series) *vide* Synoptical Vol. of that series page 64—D.

Soágan s.
(*Bháwalpúr*) On a high sand hill; zamíndárí Soágan, kárdárí Khánwáh. Marked by a peg driven in and covered up for protection.

λ	29 11 33·78
L	71 33 10·24

No. 463

Name of station, district, description, co-ordinates &c.

Sobehwálá Khú s.
(*Multán*)

	° ′ ″
λ	29 56 25·86
L	71 21 2·18

No. 404

Sonthálí s.
(*Bháwalpúr*) On a sand hill; zamíndárí Málikání, kárdárí Sultánwáh. Marked by a peg driven in and covered up for protection.

λ	29 13 51·96
L	71 10 8·47

No. 455

Sothá s.
(*Ferozpúr*)

λ	30 22 56·71
L	74 35 39·14

No. 216

Suíviár Thal Tower.
(*Bháwalpúr*) A high kachá-paká tower now partly in ruins.

λ	29 14 54·3
L	71 31 31·1

Nos. 479, 480

Súrajkund Flag,
(*Multán*) On tree.

λ	30 7 57
L	71 28 57

Súrewálá s.
(*Ferozpúr*) On roof of Hírá Sing Zamíndár's house in centre of village.

λ	30 27 0·55
L	74 44 30·20

No. 199

Taliwálá Sand Hill,
(*Sarsá*) Flag.

λ	30 21 9
L	74 14 50

Nos. 94, 95

Talwandí s.
(*Lahor*) On top of Náráyan Dás Bráhman's house in village; mauza Talwandí, thánah and tahsíl Chúnián, sub-division district Kasúr. Marked by a platform with ⊙ inscribed thereon.

λ	30 54 13·55
L	74 10 53·12

Nos. 310, 311

Tamálawálá, LXX.
(*Vide page 9—H.*)

λ	30 44 44·36
L	74 55 35·97
H	729 ·
h	26 ·

No. 81 (of Gurhágarh Meridional Series) *vide* Synoptical Vol. of that series page 20—F.

Name of station, district, description, co-ordinates &c.

Támiwálí, XX.
(*Vide page* 5—*H.*)

	°	′	″
λ	29	34	19·01
L	72	14	46·47
H	483		
h	*Not forthcoming*		

No. 34

Támkot House,
(*Ferozpúr*) Flag on Jíwan Zamíndár's house in village.

λ	30	21	7·3
L	74	30	31·2

No. 263

Támkot s.
(*Ferozpúr*) On a sand hill about 0·75 of a mile W. of village so called and about 1·50 miles E. of Lakarwálá; mauza Támkot, thánah and tahsíl Mukatsar. Marked by a platform with ⊙ inscribed thereon.

λ	30	20	29·32
L	74	29	46·66

No. 217

Tárindá Flag.
(*Bháwalpúr*)

λ	29	2	49
L	70	56	53

Tehrí House,
(*Ferozpúr*) Flag on Bhúp Sing Lambardár's house in village.

λ	30	12	34·5
L	74	37	12·2

Nos. 258, 259

Tháman s.
(*Lahor*) On Bábá Morár's high paká building; mauza Tháman, thánah, tahsíl and sub-division district Kasúr. Marked by a ⊙ inscribed on paká roof.

λ	31	9	34·11
L	74	19	0·98

No. 296

Thattí House,
(*Multán*) Flag on Lambardár's house in village.

λ	29	35	50·3
L	71	44	16·6

No. 360

Thattí s.
(*Muzaffargarh*)

λ	30	7	45·31
L	71	17	18·05

No. 431

Name of station, district, description, co-ordinates &c.

Theríwálá Khú s.
(*Multán*) Also called Darapúr s.

	°	′	″
λ	29	57	43·31
L	71	21	43·66

No. 406

Thíng House,
(*Lahor*) Flag in village.

λ	30	52	15
L	74	6	3

No. 330

Tibbí Sáhib Gurúdwárá,
(*Ferozpúr*) On sand hill.

λ	30	29	16·9
L	74	32	29·8

Nos. 72, 73

Trevit s.
(*Multán*) On a high mound, being the ruins of some old town; mauza Lálsháh, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29	31	35·89
L	71	45	5·21

No. 344

Tuthe s.
(*Ferozpúr*) On Kharak Sing Lambardár's house about the centre of village so called.

λ	30	49	43·79
L	74	41	15·39

No. 164

Tútwálá House,
(*Sarsá*) Flag on Dárá Lambardár's house.

λ	30	3	17·1
L	73	59	23·2

Nos. 283, 284

Uch s.
(*Bháwalpúr*) On turret of Saiyid Makdúm Sáhib's high paká building; zamíndárí and kárdárí Uch. Marked by a masonry pillar 6 in. high, with ⊙ inscribed thereon and covered up for protection.

λ	29	14	32·62
L	71	5	46·26

No. 452

Uch Tomb.
(*Bháwalpúr*) Centre of dome of Bíbí Jamdú's tomb.

λ	29	14	27·3
L	71	5	37·5

Nos. 474, 475

Name of station, district, description, co-ordinates &c.

Ukáwálá s.
(*Multán*) Near the well so called; mauza Odhwálá, thánah and tahsíl Shujá-ábád. Marked by a pillar and annulus with ⊙ inscribed thereon and covered up for protection.

	°	′	″
λ	29	44	20·17
L	71	29	54·17

No. 383

Usmán Kherá s.
(*Sarsá*) On top of Usmán Lambardár's house; mauza Usmán Kherá, thánah Abohar, tahsíl and sub-division district Fázilká. Marked by a platform with ⊙ inscribed thereon.

λ	30	1	12·27
L	73	56	32·91

No. 229

Vadhan House,
(*Ferozpúr*) Flag on Rahmá Lambardár's house in village.

λ	30	17	23·7
L	74	35	24·4

No. 250

Váhíwálá Khú s.
(*Multán*) On a small sand hill near the high road between Bháwalpúr and Multán, 1 mile S. of Kálúwálá village and 0·58 of a mile W. of Váhíwálá village; mauza Somiání, thánah and tahsíl Lodhran. Marked by a peg driven in and covered up for protection.

λ	29	34	47·32
L	71	38	35·38

No. 368

Virang s.
(*Ferozpúr*) On roof of Dharmsálá.

λ	30	30	40·04
L	74	41	13·30

No. 196

Walhúr s.
(*Ferozpúr*) On roof of Malúk Sing Lambardár's house.

λ	30	56	27·97
L	74	46	9·45

No. 169

Yáránwálá Khú s.
(*Multán*) On canal bank.

λ	29	54	47·45
L	71	20	27·87

No. 402

April 1875.

W. H. COLE.

.2° 74° 30′ 75° 0′

an s.

Sutlej R.

d photozincographed under the direction of

IL J. T. WALKER, R. E., F. R. S., &C.,

the Great Trigonometrical Survey of India

fice of the Survey, Dehra Doon, November 1875.

Scale 1 inch = 8 miles or $\frac{1}{506880}$

0 8 16 24 Miles

29° 0′

ANATION OF SYMBOLS USED ON THIS CHART

gnifies Station (Principal)
,, Tower Station (Principal)
,, Station (Secondary)
,, Bench-Mark
,, Referring Mark

,, Church
,, City
,, Dome
,, Flag
,, Fort
,, Hill
,, House
,, Mosque
,, Minaret
,, Staff
,, Temple
,, Tomb
,, Tower
,, Village

72° 74° 30′ 75° 0′

C. G. OLLENBACH, SINGO.