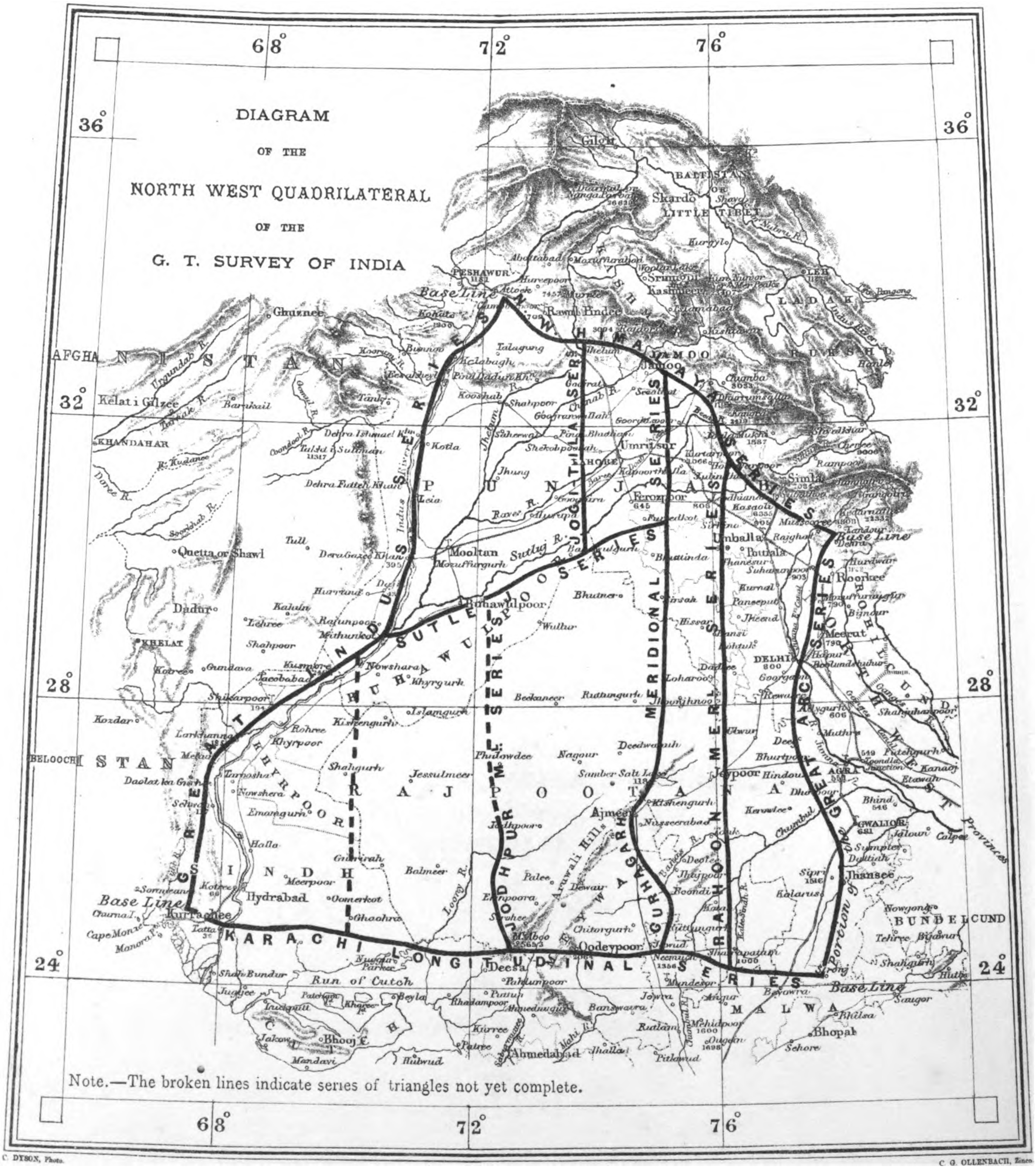
GREAT TRIGONOMETRICAL SURVEY OF INDIA.



C. DYSON, Photo.

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SYNOPSIS OF THE RESULTS OF THE OPERATIONS OF

THE GREAT TRIGONOMETRICAL SURVEY OF INDIA

VOLUME III.

DESCRIPTIONS AND CO-ORDINATES

OF THE

PRINCIPAL AND SECONDARY STATIONS AND OTHER FIXED POINTS OF

THE KARACHI LONGITUDINAL SERIES

OR SERIES B

OF THE

NORTH-WEST QUADRILATERAL.

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

Dehra Doon:
PRINTED AT THE OFFICE OF THE GREAT TRIGONOMETRICAL SURVEY OF INDIA.
M. J. O'CONNOR.
1874.

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ERRATA ET ADDENDA.

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IX—$_{B.}$	in margin.	*for* 1850-51	*read* 1851-52.
XIII—$_{B.}$	line 3 from bottom	*after* triangulation	*insert* to the length of the base-line
„	„ „	*for* distance	*read* length
8—$_{B.}$	„ 12 „	„ 5·42	„ 6·17
9—$_{B.}$	„ 4 from top	„ 3·5	„ 6·7
10—$_{B.}$	„ 12 from bottom	„ Ernipoora	„ Erinpoora
„	„ „ „	„ S.E.	„ N.W.

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 10 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 2 or 3 feet. When in the plains, and mounds were not available, towers had to be built, consisting of a solid, central pillar, surrounded by a platform formed of alternate layers of mud and wood from which it was isolated by an annulus of masonry.

The abbreviations employed in the text and on the charts at the end of the volume are as follows:—

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

These 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 list commencing on page 51—$_{B.}$ 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 this volume 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 1874.

PREFACE.

THE Karáchi (Kurrachee) Longitudinal Series constitutes the southern flank 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, and included between the British frontier-line 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 most 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 of the reduction and the procedure followed in carrying it out 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 the Great Indus Series and for the section of the Great Arc which enters into the North-West Quadrilateral.

The present is the 3rd of the Synoptical Volumes, and it gives the results of the whole of the triangulation of the Karáchi Longitudinal Series, both the principal—or that executed with a great theodolite, having an azimuthal circle 36 inches in diameter which was read by micrometer-microscopes—and the secondary, executed by smaller theodolites with circles of 6 to 14 inches in diameter, read by verniers.

By the process of reduction which has been followed the principal triangulation has been rendered perfectly consistent, both internally and externally; internally, so that if in any one of the triangles and polygonal figures of which the chains are composed, calculations are carried from one station to other 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

Introduction—written by Captain H. R. Thuillier, R.E.—and the Descriptions of the Principal Stations were originally prepared for Volume III 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 descriptions of the principal stations pages 1—*B* to 19—*B* 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, in accordance with which the four polygonal figures round the base-lines at the corners of the Quadrilateral were grouped together instead of being treated as portions of either of the two chains to which each figure may be considered as belonging. This arrangement was made with the expectation of simplifying the reduction of the Quadrilateral, which had not then been commenced; subsequently when the reduction was actually taken in hand the arrangement was found to be not only unnecessary but inconvenient; the Sironj and Dehra Dún base-line figures were therefore combined with the section of the Great Arc which lies between them, and the Karáchi and the Chach base-line figures with the Great Indus Series. There is thus an absence of uniformity in this portion of the work which is to be regretted, as it may somewhat inconvenience persons searching through the volumes devoted to the triangulation of the North-West Quadrilateral for the data of the stations of the said base-line figures; but in excuse thereof it may be pleaded that the reduction of this vast amount of triangulation was a most formidable geodetic problem, far exceeding in magnitude and intricacy anything of the kind which had been undertaken in any part of the world; consequently allowances may well be made for a slight departure from the programme of operation which was marked out in the first instance, the results of which are merely that the principal stations appertaining to the base-line figures are not numbered in order with the other stations, and that in the volumes devoted to the details of the Great Indus Series and the Great Arc (Section 24° to 30°), their descriptions must be looked for in a different place to that where those of the other stations are given; the numerical data of their co-ordinates and mutual azimuths are however given with those of the other stations.

The data given in this volume are the following:—

First (page 1—*B*), an alphabetical list 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 (page 3—*B*), a numerical list giving the names corresponding to the numbers.

Third (page 5—*B*), descriptions of the principal stations—of their structure and positions—as taken from the original records of the observations, and supplemented by an addendum, page 21*—*B*, giving the most recent information of their condition which has been received up to date.

Fourth (page 21—*B*), the angles and sides of the principal triangles, numbered and arranged in order from east to west.

Fifth (page 28—*B*), the latitudes, longitudes and heights of the principal stations, and the azimuths at each station of the surrounding ones.

Sixth (page 36—*B*), 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 (page 46—*B*), the azimuths of points surrounding the several stations of observation, the latter arranged in alphabetical order.

Eighth (page 51—*B*), the co-ordinates and descriptions of all the stations and fixed points, arranged in alphabetical order.

The heights of the principal stations at the extremities of the Series were determined by the line of levels which was carried from the tidal station of Manora, at Karáchi, through the valley of the Indus to the Chach base-line, 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 reciprocal vertical angles, back and forward observations being taken at each of the principal stations; the accordance between the two determinations of the height of the Sironj base-line (at the eastern extremity of the Series) above the mean

sea level at Karáchi, by the triangulation and by the spirit leveling operations, was most satisfactory, the difference was only 2·1 feet, the trigonometrical being in excess.

It is not usually necessary to publish the whole of the details of the sides and angles of the secondary triangulation; in some of the Series the amount of this triangulation is so great that the whole of the data could not be given without swelling the Synoptical Volumes very considerably and greatly adding to their cost; in these cases full details are given only for the most important points. But the co-ordinates of *all* the points are invariably given, however numerous they may be; and, with the aid of Nos. X, XI, and XII of the "*Auxiliary Tables to facilitate the calculations of the Survey Department of India, Dehra Doon,* 1868," local surveyors, working on a system of rectangular co-ordinates, can readily transform these data to suit their own requirements. In the present instance however, as the number of points fixed is much smaller than usual, full details are given of a large majority of the points which were fixed.

From the very commencement of the operations of the Trigonometrical Survey up to the present time all the deductions of longitudes have invariably been referred, differentially, to the longitude of the Madras Observatory, taken as 80° 17′ 21″. This value has been modified on several occasions by the successive Government Astronomers at Madras; in the year 1869, I was—to the best of my recollection—verbally informed by Mr. Pogson, who was then and still is the Astronomer, that the latest value was $5^h\ 20^m\ 57^s\cdot3$ = 80° 14′ 19″·5 as given in the Nautical Almanacs for 1862 and subsequent years, on the authority of his predecessor Captain Jacob, the value in the Nautical Almanacs for 1861 and previous years being $5^h\ 21^m\ 3^s\cdot77$ = 80° 15′ 56″·55. I have long been expecting an answer to various letters which I have written to Mr. Pogson enquiring whether my recollection of the information which he communicated to me verbally is correct, and whether any later and more accurate determination of the longitude of the observatory has been made, but hitherto no answer has been received. The following precept may however be considered as sufficiently exact for the practical requirements of surveyors and geographers,—

the whole of the longitudes given 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 of orthography in this 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 as 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 it 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 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 Mus-

soorie and scientifically Masúrí, but according to Dr. Hunter it should be spelt Masauri. In September 1873 the Government of India issued amended rules for the spelling of all names not well known, which are practically identical with those originally followed in this Department; at the same time it was ordered that the orthography of the well-known names should be retained, and that a list of all note-worthy names should be prepared, in each province, showing the orthography to be uniformly followed, in future official correspondence and publications. When these lists are published uniformity of spelling will become possible; to what extent uniformity of system will be secured will depend on the latitude taken by the compilers of the lists in defining the number of names which are to be considered as well-known; and this is a point on which considerable differences of opinion are known to exist.

Some portions of the present volume having been printed before and others after the orders were received for the employment of Dr. Hunter's system, the attempts to introduce a uniform system of orthography have occasionally led to considerable diversities of spelling; but nevertheless it is believed that the names will be generally recognizable.

The Charts accompanying this volume show the whole of the principal stations and triangulation, the positions of all the secondary points—the stations of observation as well as the hill peaks and other unvisited 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., 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.

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

Dehra Doon,
December 1874.

KARACHI LONGITUDINAL SERIES.

KARACHI LONGITUDINAL SERIES

INTRODUCTION

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

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

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

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

Season 1848-49.

PERSONNEL.

Captain T. Renny, Bengal Engineers, 1st Assistant.
„ A. Strange, Madras Cavalry, 2nd „
Mr. C. Lane, 3rd Principal Sub-Assistant.
„ W. C. Rossenrode, Junior 1st Class Sub-Asst.
„ A. T. Haycock, 3rd Class Sub-Assistant.
„ R. W. Pierce, Do.

Captain A. Strange, who had been appointed a 2nd Assistant in the Department, in December 1847, and was originally selected on account of his qualifications as an astronomical observer, and a skilful mechanic, was posted to the party, with a view to his acquiring a practical knowledge of geodetical operations. Captain Renny left Head Quarters on the 3rd October 1848, accompanied by Mr. Pierce, and arrived in the neighbourhood of Sironj on 22nd November, having been joined *en-route* at Agra,

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

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

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

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

PERSONNEL.

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

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

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

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

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

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

Season 1849-50.

PERSONNEL.

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

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

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

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

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

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

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

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

Captain Strange, with Messrs. Lane and Burt, the latter having been posted to the party in place of Mr. Pierce, who had resigned his appointment in the department, took the field on the 4th November and commenced operations at Gúrú Sikkar station, the highest hill above Mount Aboo.

Season 1850-51.
PERSONNEL.
Captain A. Strange, Madras Cavalry, 1st Assistant.
Mr. C. Lane, 3rd Principal Sub-Assistant.
" W. C. Rossenrode, Junior 1st Class Sub-Asst.
" C. H. Burt, 3rd Class Sub-Assistant.
" James McGill, Do.

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

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

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

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

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

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

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

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

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

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

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

Season 1850-51.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Captain Strange took the field again on 15th November. Even at that late date considerable sickness was found to prevail in the villages, and a large proportion of the native establishment became prostrated with fever which proved fatal in four cases. Mr. Rossenrode, having completed the preliminary operations of this series, was directed to lay out the approximate triangulation of the Indus Series, on which duty he was employed all the season. Mr. McGill was transferred to the Ráwal Pindi survey under Lieutenant Robinson, of the Bengal Engineers.

Season 1852-53.

Personnel.

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

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

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

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

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

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

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

The Karáchi base-line was measured in the season 1854-55, and on the completion of the calculations thereof, it was found that the measured length of the base-line was greater than that of the trigonometrical length, expressed in terms of the Sironj base-line, by 10·45 inches: in other words, the ratio of the total error which had been generated in the course of the triangulation was = 23 μ, μ being the millionth part of the distance. This error is taken from the then existing records of the department, in which the triangulation was reduced according to a method of successive approximations introduced by Colonel Everest.

July 17th, 1873. H. R. THUILLIER.

ALPHABETICAL LIST OF STATIONS.

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

ALPHABETICAL LIST OF STATIONS—(*Continued.*)

NUMERICAL LIST OF STATIONS.

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

NUMERICAL LIST OF STATIONS—(*Continued.*)

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

KARACHI LONGITUDINAL SERIES.

DESCRIPTION OF STATIONS.

(III.)—*(Of base-line figures).* Súrantál Hill Station, lat. 24° 14′, long. 77° 43′, is situated in pargana Sironj of the territories of the Nawab of Tonk, and stands on the highest swell of an extensive range of flat hills running north and south. The circumjacent villages, with their distances and bearings, are,—Súrantál, about 2 miles N.N.E.; Bemakheri, about 1½ miles S.W., and Sareko, about 2 miles S.S.W.

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

(IV.)—*(Of base-line figures).* Kámkherá Hill Station, lat. 24° 0′, long. 77° 46′, stands on the lands of the village of Imlani, in pargana Sironj of the territories of the Nawab of Tonk. The circumjacent villages, with their distances and bearings, are,—Imlani, 2 miles N.W.; Kámkherá, 1½ miles W.; Ladhora, about 2 miles N., and Kua, about 2 miles S.

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

I. Losalli Station, lat. 24° 6′, long. 77° 36′, is situated in the Sironj district of the Tonk territory, 1½ miles W. of Pagrani, and the same distance S.E. of Bará Losalli, on a gentle undulation of the high table-land which rises immediately to the west of the Sironj valley. Some of the circumjacent villages are as follows:—Manakherí, N. 2·33 miles; Alinagar, W. 0·85 miles, and Bogra, S.E. 3·39 miles.

The pillar is solid, 14½ feet high, and has the usual mark-stones at top and bottom, besides two intermediate ones at 5 and 10 feet respectively above the lower mark.

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

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

III. Tinsiá Hill Station, lat. 24° 6′, long. 77° 21′, is in the Tonk territory on the western border of the Sironj district, at ½ mile S. of the small village of Tinsiá, and 5 miles W.S.W. of Isarwás.

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

IV. Rámpúr Hill Station, lat. 24° 18′, long. 77° 28′, is situated on the highest peak of a double-headed hill in the Iságarh suba and Aráon district of Sindiá's territory, at 1·38 miles S.W. of the village of Rámpúr, and 4 miles S. of Aráon.

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

V. Salot Hill Station, lat. 24° 15′, long. 77° 17′, is situated on a high peak in the territory of the chieftain of Garhá, and immediately east of the valley of the Parbatti. The village of Gaddiá lies about ¼ of a mile to the E.S.E., and that of Salot about 3 miles to the west of the station.

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

VI. Dand Hill Station, lat. 24° 4′, long. 77° 9′, is situated in the Napanírá pargana of the territory of the Rájá of Rájgarh, at about 2 miles N.E. of the village of Napanír, and 3 miles south of Tehlí.

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

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

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

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

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

IX. Mátá-ká-húrá Hill Station, lat. 24° 14′, long. 76° 39′, is situated on a high hill in a wild and hilly tract appertaining to the Rájá of Kilchepúr. The circumjacent villages are Dhand, at about 1¼ miles E.; Rosúldiá, 1 mile N.W., and Mawá-kherá, 1¼ miles N.

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

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

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

XI. Sartal Hill Station, lat. 24° 30′, long. 76° 40′, is situated upon a high range of hills in the territory of the Rájá of Pátan. The town of Sartal is distant 1·55 miles, its azimuth being 37° 25′.

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

XII. Rangáon Hill Station, lat. 23° 55′, long. 76° 26′, is on the highest point of an isolated hill, the northern half of which belongs to the Jírápúr district of Holkar's territory, and the southern half to the Chaperá pargana of the Narsinghar state. The village of Rangáon is distant about a mile to the S.E.; Berkherí, about 1½ miles S.; Bánskherí, about 1¼ miles N.W., and Jharmáo, about 1½ miles N.W.W.

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

XIII. Kúsalpúrá Hill Station, lat. 24° 18′, long. 76° 22′, is situated near the northern boundary of the Jhallawar state, in the Haráotí district of the province of Ajmere. The village of Kúsalpúrá is distant about ¼ mile W.

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

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

The pillar is solid, and is 4·42 feet high. It has two mark-stones, one at bottom, and the other at top.

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

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

XVI. Gurária Hill Station, lat. 24° 26′, long. 76° 7′, is fixed upon the eastern half of a small low isolated hill, and is in the territories of Holkar. The western portion of the hill is in the Pátan state. The circumjacent places are as follows:—The village of Gurária, distant about a mile to the southward, the large town of Sunail, about five miles in the same direction, and the city of Pátan, 13·704 miles to the N.E.

The pillar is 4½ feet high, and is solid. It has a mark-stone at the top, and another at bottom.

XVII. Khajúri Hill Station, lat. 24° 14′, long. 75° 46′, is fixed on a small isolated flat-topped hill in Holkar's territories. The circumjacent villages are as follows:—Nerkherá, N.W. by W. 2 miles; Samelí, N. 2½ miles; Kotrá, a large village, E. 1 mile; Khajúri, S.S.W. 1 mile.

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

XVIII. Nimthúr Hill Station, lat. 24° 32′, long. 75° 50′, is situated in Holkar's territories, and N.E. of the large town of Bhanpúr, on the high range of hills that runs continuously

from that town to Rámpúrá. The village of Nimthúr lies about a mile to the eastward, at the foot of the hills.

The pillar, 8 feet 10½ inches in height, is solid, and has three mark-stones, one at top, another at bottom, and the third 4 feet above the latter.

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

From want of time the pillar could not be built of masonry. It consists of three large stones placed in a triangular form, height 0·75 feet.

XX. Rámpúrá Hill Station, lat. 24° 29′, long. 75° 29′, is situated in Holkar's territories, about a mile north of the large town of Rámpúrá, and on a high range of hills.

The pillar, 6 feet 9 inches in height, is solid, and carries three mark-stones, one at top, another at bottom, and the third 3 feet above the latter.

XXI. Búda Station, lat. 24° 14′, long. 75° 11′, is situated in Holkar's territories. The following villages lie around the station, *viz.*; Búda, 1 mile N.E.; Ger-rawud, due E. 2 miles; Talláopiplá, E. by S. one-fifth of a mile; Bájpúr, S.W. 0·8 mile.

Four mark-stones are placed in the solid pillar, which is 5·2 feet high, *viz.*; at level of foundation, 1·23 and 2·75 feet above it, and on top of pillar.

XXII. Nanka Húáro Hill Station, lat. 24° 32′, long. 75° 17′, is situated in Holkar's territories, on the southern edge of the same extensive flat-topped range as Rámpúrá H. S. and Nimthúr H. S. The circumjacent villages are as follows:—Mota Soárá to the N. about 2 miles; Nanka Húáro, N.E. by N. about 1½ miles; Mokrí, W. by N. about 3 miles; Kherawudda, S. about 1½ miles.

The pillar is solid, and 7¾ feet high. It has a mark-stone at bottom, and another at top.

XXIII. Aramlia Station, lat. 24° 25′, long. 75° 2′, is in the Jawud Neemuch district. The following villages lie near the station, *viz.*; Deori, N. 2 miles; Bijurwas, N.W. by N. 1½ miles; Kana-Kherá, N.W. 1½ miles; Rattrio, W. 2 miles; Palsora, or Parorá, a large village, S.E. by S. 4 miles; Aramlia, E. 1 mile.

The pillar is solid, and 5·42 feet high. It carries a mark-stone at the bottom, another 2 feet higher, and a third at the surface.

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

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

XXV. Gopálpúra Hill Station, lat. 24° 18′, long. 74° 49′, is situated in the Jawud Neemuch district, on a range of wild hills, inhabited chiefly by Bhíls. The village of Gopálpúra is about 1½ miles E., and that of Chota Kherá about 3 miles N.E. of the station.

The pillar is solid, and 5·17 feet high. It carries a mark-stone at the bottom, another 2 feet higher, and a third at the top.

XXVI. Mendki Hill Station, lat. 24° 38′, long. 74° 56′, is situated in the dominions of

the Ráná of Udaipúr, on the southern edge of the same extensive flat range as Nimthúr H. S., Rámpúra H. S., and Nanka Húáro H. S. The town of Jawud Neemuch lies in the plain below the station, towards the S.W., at a distance of 3 miles.

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

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

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

XXVIII. Sánd Hill Station, lat. 24° 43′, long. 74° 35′, is on a irregular cluster of high hills in the Nimdhera district, appertaining to the Nawab of Tonk. The village from which the station derives its name is distant 1½ miles to the N.E.

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

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

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

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

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

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

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

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

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

XXXIII. Tiki Hill Station, lat. 24° 56′, long. 73° 53′, is fixed upon the highest of an

irregular cluster of low hills, in pargana Nathdwára, territory Udaipúr. The large town of Nathdwára, celebrated for its sanctity, is east of the station.

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

XXXIV. Ter Hill Station, lat. 24° 47′, long. 73° 39′, stands upon the highest point of one of the ridges which rise from the plateau of the Araballas, in the Chalpakí pargana of the Udaipúr territories. The large town of Gogunda is distant 5·680 miles to the S.S.W., and the village of Búballá lies to the N.W. at 1·623 miles.

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

XXXV. Marwar Hill Station, lat. 24° 26′, long. 73° 35′, is situated upon a high ridge of the Araballa range, in the midst of a wild tract called the Bhílwárá, from its being inhabited exclusively by Bhíls. The village of Jharol is distant about 3 miles to the west.

The pillar is solid, and 2·6 feet high. It has one mark-stone at surface, another 1 foot below, and a third at level of foundation.

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

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

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

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

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

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

XXXIX. Belka Hill Station, lat. 24° 47′, long. 73° 12′, is situated on a high hill of the Araballa range in pargana Rohai of the Sarohi state, and is distant 24 miles from Mount Aboo.

The pillar is solid, and 5·6 feet high. A mark-stone was placed at bottom, another 2 feet higher, and a third at top.

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

The pillar is solid, and 3·75 feet high. A mark-stone was placed at top, a second at bottom, and a third 2 feet above the latter.

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

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

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

The pillar is solid, and 3·5 feet high. It has a mark-stone at surface, and another engraved on the rock *in situ*.

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

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

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

The pillar is solid, and 3·2 feet high. It has one mark-stone at top, another at level of foundation, and a third 2 feet above.

XLV. Bargáon Hill Station, lat. 24° 40′, long. 72° 17′, is situated in the Jodhpúr territory, on the highest point of a conspicuous isolated hill, about 2 miles S.W. of the town of Bargáon.

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

XLVI. Birona Station, lat. 24° 27′, long. 72° 16′, is situated in the dominions of the Nawab of Palhanpúr, on the summit of a gentle swell of ground, about 1 mile from the village of Birona.

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

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

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

XLVIII. Sitora Station, lat. 24° 31′, long. 72° 9′, is situated in the territories of the Nawab of Palhanpúr, on a high bank of sand, after which it is called. The circumjacent

villages are as follows :—Rampúrá, about 1½ miles N.; Vorú, about ¾ miles W. by N.; Wadir, about 1 mile S., and the town of Dhanala, about 5 miles to the west.

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

XLIX. Atithol Station, lat. 24° 42′, long. 72° 6′, is situated in the territory of the Nawab of Palhanpúr, on a high bank or ridge of sand, about 1½ miles N.E. of the large village of Yeta.

The pillar is solid, and 3·3 feet high. A mark-stone was imbedded at surface, another at bottom, and a third 2 feet above the latter.

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

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

LI. Khankharia Station, lat. 24° 37′, long. 71° 56′, is situated on a low swell of sand of the same name. The large village of Ninawa lies about 3½ miles to the N.E., and Baja village is distant about 2¼ miles.

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

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

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

LIII. Gulásan Tower Station, lat. 24° 41′, long. 71° 46′, is situated in the Jodhpur territory. The village of Gulásan is distant about 1 mile to the west, and the town of Sachor about 5 miles to the N.E.

The platform is 14·7 feet high. Five mark-stones were imbedded in the usual masonry pillar as follows : One at level of foundation, three others at 2, 8, and 14 feet successively above this level, and the fifth at the surface of pillar.

LIV. Waladhar Station, lat. 24° 32′, long. 71° 48′, is situated in the Palhanpúr territory on a knoll about 2 miles west by south of the village of Waladhar. The adjacent villages are as follows :—Kahilgáon, about 4 miles to the north, and Sohana, about the same distance to the north-east.

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

LV. Dáwal Station, lat. 24° 51′, long. 71° 45′, is situated in the Sachor pargana of the Jodhpúr territories on a swell of sand, after which it is named. Dáwal village lies N.N.E. at 0·6 miles; Palrí, S. at 2·0 miles; and Amlí, S.S.W. at 2·4 miles.

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

LVI. Rajúra Tower Station, lat. 24° 35′, long. 71° 35′, is situated in the territories of the Nawab of Palhanpúr, on the site of the ancient village of Rajúra. The village of Saráo lies about 6 miles to the south.

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

LVII. Sarla Station, lat. 24° 47′, long. 71° 37′, is situated in the Jodhpúr territory on a slightly elevated knoll, about 2 miles S.E. of Jámí.

The pillar is solid, and 2·17 feet high. A mark-stone was placed at top, and another at bottom.

LVIII. Dhingpúra Station, lat. 24° 44′, long. 71° 28′, is situated on a swell of sand in the Sachor pargana of the Jodhpúr territories. The village of Dhingpúra lies about 2 miles to the west.

The pillar is 14·25 feet high. It has seven mark-stones buried as follows:—One on a level with the bottom of the foundation, the others 3, 5, 10, 12, 13, and 14·25 feet respectively above it.

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

The pillar is 1·25 feet high. It has two mark-stones, one at surface, the other below.

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

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

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

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

LXII. Didáwa Hill Station, lat. 24° 51′, long. 71° 21′, is on a sandhill in the Tharr, or Little-desert, and distant from the hamlet of Didáwa ¼ of a mile. It is in the Jodhpúr territories.

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

LXIII. Sohági Hill Station, lat. 24° 48′, long. 71° 10′, is situated in the Jodhpúr territories, on a sandhill in the Tharr, or Little-desert. The well-known town of Bakesar is distant about 3½ miles, and the village of Sohági is some ¼ of a mile from the station.

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

LXIV. Bhilgáon Hill Station, lat. 24° 42′, long. 71° 7′, is situated on a sandhill in that

portion of the Tharr, or Little-desert, appertaining to Bhúj. The village of Sammari, bearing 16° east of the ray to Jhund Station, is about 2 miles distant.

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

LXV. Gangasára Hill Station, lat. 24° 59′, long. 71° 14′, is fixed on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The village of Gangasára is distant 2 or 3 miles towards the N.E., and Faglia village is about 2½ miles away.

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

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

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

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

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

LXVIII. Alam-Shahar Hill Station, lat. 24° 52′, long. 70° 53′, is situated on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The azimuths and distances of circumjacent villages are as follows:—Lonia, 312° 56′; miles, 2·5. Herar, 93° 46′; miles, 6. Aoramar, 178° 26′; miles, 4. Karúro, 291° 16′; miles, 8.

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

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

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

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

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

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

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

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

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

LXXIII. Dhárindera Hill Station, lat. 25° 0′, long. 70° 27′, is situated on a sandhill in that portion of the Tharr, or Little-desert, appertaining to Bhúj. Dhárindera village is distant about ¾ miles, at an azimuth of 290°.

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

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

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

LXXV. Rojhra Hill Station, lat. 24° 57′, long. 70° 17′, is situated on a sandhill in that part of the Tharr, or Little-desert, appertaining to Bhúj. The village of Paríára is distant about 3½ miles to the N.N.W.

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

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

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

LXXVII. Drábi Hill Station, lat. 24° 44′, long. 70° 6′, is situated on a sandhill in that portion of the Tharr, or Little-desert, which appertains to Bhúj. The following are the azimuths and distances of the circumjacent villages :—Islámkot (a town), 285° ; miles, 5. Kamra, 175° ; miles, 2·3. Dipiar, 35° ; miles, 2·5.

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

LXXVIII. Sandohar Hill Station, lat. 25° 3′, long. 70° 1′, is situated on a sandhill in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The following are the azimuths and distances of circumjacent villages :—Sandohar, 280° ; miles, 0·5 ; and Arnará, 155°, miles 1.

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

LXXIX. Kíl Hill Station, lat. 24° 47′, long. 69° 50′, is situated on a sandhill so named

in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The town of Mittí is distant about 2¾ miles S.

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

LXXX. Chánga Hill Station, lat. 24° 59′, long. 69° 54′, is situated on a sandhill bearing that name in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The town of Chelar lies to the east at about 3½ miles.

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

LXXXI. Búgia Hill Station, lat. 24° 56′, long. 69° 37′, is fixed on a sandhill so named in that portion of the Tharr, or Little-desert, appertaining to Bhúj. The village of Haida is distant about 1½ miles W.

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

LXXXII. Pádria Hill Station, lat. 24° 44′, long. 69° 33′, is situated on a sandhill in that part of the Tharr, or Little-desert, which appertains to Bhúj. The following are circumjacent villages with their azimuths and distances:—Ladia, 160°; miles, 1·0. Nabísar, 242°; miles, 3·0. Kalián, 357°; miles, 2.

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

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

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

LXXXIV. Manjákar Tower Station, lat. 25° 7′, long. 69° 30′, is situated in the Hydrabad Collectorate of Scinde. The azimuths and distances of circumjacent villages are as follows:—Manjákar, 192°; miles, 0·7. Shahokathar, 264°; miles, 4. Kakúbíro, 299°; miles, 3.

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

LXXXV. Mairáb-ká-Shahar Tower Station, lat. 24° 50′, long. 69° 23′, is situated in the Hydrabad Collectorate of Scinde. The village of Mairáb-ká-Shahar is distant about 2 miles.

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

LXXXVI. Amírsha Tower Station, lat. 25° 0′, long. 69° 23′, is situated in the Hydrabad Collectorate of Scinde. The village of Amírsha is only 70 yards away.

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

LXXXVII. Farráha Tower Station, lat. 24° 56′, long. 69° 14′, is situated in the Hydrabad Collectorate of Scinde. The village of Farráha is distant 0·3 miles, azimuth 120°, and that of Sawun 0·8 miles, azimuth 340°.

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

LXXXVIII. Pangra Tower Station, lat. 24° 46′, long. 69° 14′, is situated in the Hydrabad Collectorate of Scinde. The azimuths and distances of circumjacent villages are as follows: Pangra, 342°; miles, 0·4. Khanghar, 69°; miles 2. Máhamad Alí Sand, 153° 22′; miles, 2. Nurpower, 217° 52′; miles, 2·5

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

LXXXIX. Ján Mahamad Tower Station, lat. 25° 4′, long. 69° 15′, is situated in the centre of the village of that name in the Hydrabad Collectorate of Scinde.

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

XC. Adúri Tower Station, lat. 24° 50′, long. 69° 6′, is situated in the Hydrabad Collectorate of Scinde. The nearest of several small villages bearing that name is distant about 1·5 miles N.N.E.

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

XCI. Khori Tower Station, lat. 25° 1′, long. 69° 6′, is situated in the Hydrabad Collectorate of Scinde at about 1 mile from the largest of the three villages after which it is named. The village of Kariana is distant 2½ miles, at an azimuth of 350°, and that of Raen 1·3 miles nearly due N.

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

XCII. Dang-ka-basti Tower Station, lat. 24° 55′, long. 68° 56′, is built in the centre of the village of that name, in the Hydrabad Collectorate of Scinde. Seidpúr village is distant about ½ mile N.W.

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

XCIII. Shá Turel Tower Station, lat. 24° 46′, long. 68° 56′, is situated in the centre of the village of that name, and in the Hydrabad Collectorate of Scinde.

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

XCIV. Nidamáni Tower Station, lat. 25° 4′, long. 68° 54′, is situated in the Hydrabad Collectorate of Scinde, on the ruins of an ancient town, distant about 0·4 miles from the village of Nidamáni. Golám Alí Tandá (a town) is distant 2 miles N.N.E.

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

XCV. Alamkhán Tower Station, lat. 24° 50′, long. 68° 46′, is situated in the Hydrabad Collectorate of Scinde. Alam Khán Sigari village is distant about 0·15 miles.

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

XCVI. Hakimáni Tower Station, lat. 24° 59′, long. 68° 45′, is situated in the Hydrabad Collectorate of Scinde. The adjacent villages are,—Bilasand, distant about 0·6 miles, and Alipúr, at about 1·5 miles.

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

XCVII. Kát-báman Tower Station, lat. 24° 53′, long 68° 37′, stands on a high mound, the site of the ancient city of that name, in the Hydrabad Collectorate of Scinde. An old musjid stands at about 40 feet from the tower to the S.

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

XCVIII. Kakeja Tower Station, lat. 24° 43′, long. 68° 37′, is built 0·3 of a mile to the S.W. of the village so called, in the Hydrabad Collectorate of Scinde.

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

XCIX. Nága-Sha Tower Station, lat. 25° 1′, long. 68° 37′, is situated 0·4 miles from the village of the same name in the Hydrabad Collectorate of Scinde.

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

C. Chútli Tower Station, lat. 24° 46′, long. 68° 26′, is situated about 1½ miles N.W. of the village of Khorwa, in the Hydrabad Collectorate of Scinde.

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

CI. Kanád Tower Station, lat. 24° 56′, long. 68° 25′, is built close to and W. of the village of the same name in the Hydrabad Collectorate of Scinde. The following are circumjacent villages, with their azimuths and distances :—Lairaní, 295°; miles, 2·5. Dádu, 125°; mile, 1. Dandí, 170°; miles, 4·5.

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

CII. Hilaia Hill Station, lat. 24° 52′, long. 68° 5′, is about 1 mile from the west bank of the Indus, and within 200 yards of the main road running from Jherak to Taka. The village after which the station is named is about 4 miles.

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

CIII. Dadúri Hill Station, lat. 25° 0′, long. 68° 13′, is situated about 300 yards from

the west bank of the Indus, and 2 miles south-west of the large village of Súnda. It derives its name from a hunting preserve distant about ¼ mile to the south.

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

CIV. Károthol Hill Station, lat. 24° 54′, long. 67° 56′, is situated in the Karáchí Collectorate of Scinde, on the highest part of a hill of the same name.

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

CV. Ghatána Hill Station, lat. 25° 4′, long. 68° 1′, is situated on the highest point of a long low isolated range about 1½ miles in length, and is distant 0·8 of a mile from the village after which it is called.

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

CVI. Kára Hill Station, lat. 25° 2′, long. 67° 42′, is situated on the southern of two points on the high hill so called.

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

CVII. Sáhiji Hill Station, lat. 24° 51′, long. 67° 38′, is situated on a small mound on the northern edge of a long flat range of hills, after which it is named. The well-known temple of Kanpitianí is about a mile and a-half to the north.

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

CVIII. Kúni Hill Station, lat. 25° 11′, long. 67° 48′, is situated on the highest part of the hill so called.

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

CIX. Sáwaji Hill Station, lat. 25° 14′, long. 67° 33′, is situated on the highest point of a high rocky hill of that name. No villages can be seen from the station.

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

(XXIII.)—*(Of base-line figures).* Bol Hill Station, lat. 24° 55′, long. 67° 23′, stands on the highest of three knobs on a hill 3 miles N.W. of Gagar, on the hill road between Karáchí and Kotree. It is in the Karáchí Collectorate of Scinde.

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

(XXV.)—*(Of base-line figures).* Bolálio Hill Station, lat. 25° 9′, long. 67°24′, stands on the highest point of a very extensive irregular-shaped hill, in the Karáchí district. The hill commands a view to the south of the plain in which the Karáchí base-line is situated. The river Tudda flows round the western foot of the hill, at a distance of about 3 miles, and the village of Morid-ka-got lies about 8 miles W.

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

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

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

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

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

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

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

No.	Local name	District	Pargana &c.	Village	Remark
CVIII	Koni Thulo	Karáchi	Kohistán	Kulhejo Khur	
CIX	Thulo Jubul Sháh-waiji	„	„	Pud Kani	
(XXIII)	Bor	„	Táluka Karáchi	Mallír Makán Darsáno Chúto	
(XXV)	Bolári	„	„ „	Hubb Makán Thudo	

KARACHI LONGITUDINAL 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
		"	° ′ ″						"	° ′ ″			
1	(IV)	·34	45 32 9·46	4·8060767	63984·8	12·118	6	IV	·26	42 59 50·09	4·7357108	54414·0	10·306
	(III)	·34	49 10 0·70	4·8314430	67833·3	12·847		III	·27	50 53 53·19	4·7918258	61919·3	11·727
	I	·34	85 17 49·84	4·9511023	89351·6	16·923		V	·27	86 6 16·72	4·9009453	79605·9	15·077
2	(III)	·39	63 38 22·70	4·9098775	81260·1	15·390	7	III	·30	81 12 40·18	4·9151695	82256·4	15·579
	I	·39	71 29 16·27	4·9344860	85997·5	16·287		V	·30	57 57 50·05	4·8485484	70558·3	13·363
	IV	·39	44 52 21·03	4·8060767	63984·8	12·118		VI	·30	40 49 29·77	4·7357108	54414·0	10·306
3	I	·44	58 25 31·92	4·9009453	79605·9	15·077	8	V	·64	79 49 12·55	5·0719977	118031·4	22·354
	IV	·45	61 9 17·33	4·9129936	81845·3	15·501		VI	·64	56 52 15·41	5·0018434	100425·4	19·020
	III	·45	60 25 10·75	4·9098775	81260·1	15·390		VIII	·64	43 18 32·04	4·9151695	82256·4	15·579
4	(IV)	·39	45 4 53·87	4·8597773	72406·5	13·713	9	IV	·45	66 9 58·14	4·9769036	94820·8	17·958
	I	·39	93 21 34·17	5·0089275	102076·9	19·333		V	·45	77 9 18·99	5·0046089	101066·9	19·141
	II	·38	41 33 31·96	4·8314430	67833·3	12·847		VII	·45	36 40 42·87	4·7918258	61919·3	11·727
5	I	·36	51 25 45·88	4·8290877	67466·4	12·778	10	V	·64	58 57 19·39	4·9831816	96201·4	18·220
	II	·37	71 31 35·75	4·9129936	81845·3	15·501		VII	·65	63 25 45·90	5·0018434	100425·4	19·020
	III	·37	57 2 38·37	4·8597773	72406·5	13·713		VIII	·64	57 36 54·71	4·9769036	94820·8	17·958

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

No. of triangle	Station	Spherical excess	Corrected plane angle	Distance		
				Log. feet	Feet	Miles
		"	° ′ ″			
	VI	1·23	49 29 33·50	5·1215489	132296·7	25·056
11	VIII	1·23	87 47 36·20	5·2402288	173871·7	32·930
	IX	1·23	42 42 50·30	5·0719977	118031·4	22·354
	VIII	·92	43 15 33·74	4·9833201	96232·1	18·226
12	IX	·92	66 19 41·47	5·1092672	128607·8	24·358
	XI	·92	70 24 44·79	5·1215489	132296·7	25·056
	IX	·73	79 20 20·14	5·0916671	123500·2	23·390
13	XI	·73	50 41 12·05	4·9877977	97229·4	18·415
	XIII	·72	49 58 27·81	4·9833201	96232·1	18·226
	XI	·92	51 37 54·86	5·0280189	106664·2	20·202
14	XIII	·93	63 9 58·35	5·0842016	121395·2	22·992
	XIV	·93	65 12 6·79	5·0916671	123500·2	23·390
	XIII	·59	48 7 43·77	4·9181116	82815·5	15·685
15	XIV	·59	58 19 1·89	4·9760745	94640·0	17·924
	XVI	·60	73 33 14·34	5·0280189	106664·2	20·202
	XIII	·87	55 44 49·06	5·0681407	116987·8	22·157
16	XVI	·87	82 17 20·34	5·1469214	140256·0	26·564
	XV	·86	41 57 50·60	4·9760745	94640·0	17·924
	VI	1·93	49 30 35·45	5·1779794	150653·6	28·533
17	IX	1·93	69 7 15·52	5·2673728	185085·7	35·054
	X	1·93	61 22 9·03	5·2402288	173871·7	32·930
	X	·91	67 5 49·94	5·1492051	140995·5	26·704
18	IX	·91	33 4 48·12	4·9219084	83542·7	15·822
	XII	·92	79 49 21·94	5·1779794	150653·6	28·533
	IX	1·01	69 24 57·72	5·1471640	140334·4	26·578
19	XII	1·01	40 26 12·46	4·9877977	97229·4	18·415
	XIII	1·02	70 8 49·82	5·1492051	140995·5	26·704
	XII	1·48	53 33 39·14	5·1469214	140256·0	26·564
20	XIII	1·49	72 50 5·57	5·2216134	166576·4	31·549
	XV	1·48	53 36 15·29	5·1471640	140334·4	26·578
	XV	·77	85 0 4·65	5·1394110	137851·3	26·108
21	XVI	·77	37 16 52·63	4·9233440	83819·3	15·875
	XVII	·77	57 43 2·72	5·0681407	116987·8	22·157
	XVI	·89	51 51 26·00	5·0418681	110120·5	20·856
22	XVII	·89	48 14 6·70	5·0188557	104437·3	19·780
	XVIII	·90	79 54 27·30	5·1394110	137851·3	26·108
	XV	·96	42 8 15·12	5·0188557	104437·3	19·780
23	XVI	·97	89 8 19·32	5·1921408	155647·0	29·479
	XVIII	·96	48 43 25·56	5·0681407	116987·8	22·157
	XVII	·61	113 44 10·02	5·1967310	157300·8	29·792
24	XVIII	·60	26 24 32·79	4·8832587	76429·1	14·475
	XIX	·61	39 51 17·19	5·0418681	110120·5	20·856
	XVIII	·96	41 54 44·31	5·0215104	105077·7	19·901
25	XIX	·97	47 44 30·21	5·0660416	116423·8	22·050
	XX	·97	90 20 45·48	5·1967310	157300·8	29·792
	XVII	·94	58 11 13·57	5·0660416	116423·8	22·050
26	XVIII	·94	68 19 17·72	5·1048809	127315·4	24·113
	XX	·94	53 29 28·71	5·0418681	110120·5	20·856
	XIX	·97	73 2 17·16	5·1324807	135669·0	25·695
27	XX	·97	59 9 37·28	5·0855898	121783·9	23·065
	XXI	·96	47 48 5·56	5·0215104	105077·7	19·901
	XX	·63	55 40 46·46	5·0499755	112195·5	21·249
28	XXI	·62	31 23 19·46	4·8497554	70754·7	13·401
	XXII	·63	92 55 54·08	5·1324807	135669·0	25·695
	XIX	·53	25 28 10·18	4·8497554	70754·7	13·401
29	XX	·54	114 50 24·80	5·1740946	149312·0	28·279
	XXII	·53	39 41 25·02	5·0215104	105077·7	19·901
	XXII	·61	46 37 47·64	4·9214691	83458·2	15·806
30	XXI	·61	55 37 4 33	4·9765810	94750·4	17·945
	XXIII	·61	77 45 8·03	5·0499755	112195·5	21·249
	XXI	·40	74 13 4·60	4·9525354	89646·9	16·979
31	XXIII	·39	42 9 41·31	4·7960898	62530·2	11·843
	XXIV	·40	63 37 14·09	4·9214691	83458·2	15·806
	XXIV	·45	58 42 43·22	4·9113453	81535·2	15·442
32	XXIII	·45	51 18 20·95	4·8719683	74467·8	14·104
	XXV	·45	69 58 55·83	4·9525354	89646·9	16·979
	XXV	·54	40 18 10·60	4·9344921	85998·7	16·288
33	XXIII	·54	101 52 17·95	5·1143126	130110·6	24·642
	XXVI	·54	37 49 31·44	4·9113453	81535·2	15·442
	XXII	·64	43 37 13·49	4·9344921	85998·7	16·288
34	XXIII	·65	86 54 29·11	5·0950874	124476·5	23·575
	XXVI	·64	49 28 17·40	4·9765810	94750·4	17·945

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
		"	° ′ ″						"	° ′ ″			
	XXVI	1·19	89 12 55·22	5·2379367	172956·4	32·757		XXXIV	1·14	73 17 9·72	5·1649710	146207·9	27·691
35	XXV	1·18	42 0 11·06	5·0635141	115748·2	21·922	47	XXXVII	1·13	51 56 19·35	5·0798865	120195·0	22·764
	XXVIII	1·19	48 46 53·72	5·1143126	13011·06	24·642		XXXVIII	1·13	54 46 30·93	5·0958844	124705·2	23·618
	XXV	·98	43 44 58·85	5·0841685	121386·0	22·990		XXXIII	·45	49 48 52·91	4·8684117	73860·4	13·989
36	XXVIII	·98	36 24 43·95	5·0178575	104197·6	19·734	48	XXXIV	·45	57 48 50·44	4·9128765	81823·2	15·497
	XXVII	·99	99 50 17·20	5·2379367	172956·4	32·757		XXXVI	·46	72 22 16·65	4·9644508	92140·6	17·451
	XXV	1·07	85 45 11·00	5·2056240	160555·0	30·408		XXXIV	·56	53 33 53·17	4·9855703	96732·0	18·320
37	XXVI	1·06	40 19 51·30	5·0178575	104197·6	19·734	49	XXXVI	·57	88 32 2·06	5·0798865	120195·0	22·764
	XXVII	1·07	53 54 57·70	5·1143126	130110·6	24·642		XXXVIII	·56	37 54 4·77	4·8684117	73860·4	13·989
	XXVIII	1·14	80 10 28·65	5·1915425	155432·8	29·438		XXXVIII	·63	38 5 33·38	4·9735392	94089·1	17·820
38	XXVII	1·13	49 30 58·83	5·0791110	119980·6	22·724	50	XXXVII	·62	35 22 40·38	4·9459537	88298·6	16·723
	XXIX	1·13	50 18 32·52	5·0841685	121386·0	22·990		XXXIX	·63	106 31 46·24	5·1649710	146207·9	27·691
	XXVII	·99	59 24 55·97	5·1290445	134599·8	25·492		XXXVII	1·00	80 54 27·03	5·1841945	152825·0	28·944
39	XXIX	·99	36 47 55·17	4·9715322	93655·3	17·738	51	XXXIX	1·00	61 39 9·24	5·1342106	136210·5	25·797
	XXX	·99	83 47 8·86	5·1915425	155432·8	29·438		XL	·99	37 26 23·73	4·9735392	94089·1	17·820
	XXX	1·31	59 17 26·64	5·1383142	137503·6	26·042		XXXIX	1·11	43 24 40·31	5·0314494	107510·1	20·362
40	XXIX	1·31	63 23 54·29	5·1553384	143000·8	27·083	52	XL	1·11	58 55 47·53	5·1270934	133996·5	25·378
	XXXII	1·30	57 18 39·07	5·1290445	134599·8	25·492		XLII	1·11	77 39 32·16	5·1841945	152825·0	28·944
	XXIX	1·33	63 35 12·85	5·1598055	144479·3	27·363		XL	1·05	54 36 16·31	5·0971227	125061·2	23·686
41	XXXII	1·32	57 56 34·11	5·1358358	136721·2	25·894	53	XLII	1·05	80 54 23·34	5·1803796	151488·5	28·691
	XXXIII	1·33	58 28 13·04	5·1383142	137503·6	26·042		XLIII	1·04	44 29 20·35	5·0314494	107510·1	20·362
	XXVIII	1·45	58 55 28·27	5·1921625	155654·8	29·480		XLII	1·14	64 34 41·49	5·1300885	134923·8	25·554
42	XXIX	1·45	79 45 39·62	5·2524693	178841·9	33·872	54	XLIII	1·14	58 34 52·14	5·1054601	127485·3	24·145
	XXXI	1·45	41 18 52·11	5·0791110	119980·6	22·724		XLIV	1·13	56 50 26·37	5·0971227	125061·2	23·686
	XXIX	1·54	66 8 37·80	5·2050256	160334·0	30·366		XXXVIII	·96	64 51 49·48	5·1475244	140450·9	26·601
43	XXXI	1·53	51 14 56·38	5·1358358	136721·2	25·894	55	XXXIX	·97	80 26 44·60	5·1846654	152990·9	28·976
	XXXIII	1·54	62 36 25·82	5·1921625	155654·8	29·480		XLI	·96	34 41 25·92	4·9459537	88298·6	16·723
	XXXIII	·85	54 1 3·46	5·0686945	117137·1	22·185		XXXIX	1·38	67 57 34·52	5·1860577	153482·1	29·069
44	XXXII	·85	39 31 57·74	4·9644508	92140·6	17·451	56	XLI	1·37	54 1 18·48	5·1270934	133996·5	25·378
	XXXIV	·85	86 26 58·80	5·1598055	144479·3	27·363		XLII	1·38	58 1 7·00	5·1475244	140450·9	26·601
	XXXII	·88	72 4 5·34	5·1083223	128328·2	24·305		XLI	1·51	44 9 33·02	5·1054601	127485·3	24·145
45	XXXIV	·87	47 39 9·21	4·9986361	99686·5	18·880	57	XLII	1·52	78 50 9·81	5·2541461	179533·8	34·003
	XXXV	·88	60 16 45·45	5·0686945	117137·1	22·185		XLIV	1·51	57 0 17·17	5·1860577	153482·1	29·069
	XXXV	·83	67 12 15·94	5·0958844	124705·2	23·618		XLIV	·68	67 23 32·45	5·0994649	125737·5	23·814
46	XXXIV	·83	41 13 53·96	4·9501585	89157·6	16·886	58	XLIII	·68	30 28 5·57	4·8392480	69063·4	13·080
	XXXVII	·84	71 33 50·10	5·1083223	128328·2	24·305		XLV	·68	82 8 21·98	5·1300885	134923·8	25·554

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
		"	° ′ ″						"	° ′ ″			
	XLIII	·63	42 10 53·32	4·9265618	84442·6	15·993		LIII	·33	60 49 29·70	4·8471600	70333·1	13·321
59	XLV	·63	48 47 43·85	4·9759557	94614·1	17·919	71	LVI	·32	52 55 56·45	4·8080407	64274·8	12·173
	XLVI	·63	89 1 22·83	5·0994649	125737·5	23·814		LVII	·33	66 14 33·85	4·8676236	73726·5	13·963
	XLVI	·28	65 15 10·47	4·8884804	77353·6	14·650		LII	·25	54 14 17·93	4·7590266	57415·2	10·874
60	XLV	·27	32 16 11·25	4·6577813	45475·9	8·613	72	LIII	·26	63 27 15·93	4·8013810	63296·7	11·988
	XLVIII	·28	82 28 38·28	4·9265618	84442·6	15·993		LV	·25	62 18 26·14	4·7969275	62650·9	11·866
	XLV	·33	61 43 55·37	4·8603275	72498·3	13·731		LIII	·23	51 53 32·15	4·7291536	53598·6	10·151
61	XLVIII	·33	48 15 43·73	4·7883330	61423·3	11·633	73	LV	·23	70 39 43·95	4·8080407	64274·8	12·173
	XLIX	·33	70 0 20·90	4·8884804	77353·6	14·650		LVII	·23	57 26 43·90	4·7590266	57415·2	10·874
	XLVIII	·37	52 41 23·48	4·8371805	68735·4	13·018		LVII	·24	60 25 35·19	4·7984423	62869·8	11·907
62	XLIX	·37	70 17 6·75	4·9103800	81354·2	15·408	74	LVI	·23	42 55 33·56	4·6922424	49231·4	9·324
	LI	·37	57 1 29·77	4·8603275	72498·3	13·731		LVIII	·24	76 38 51·25	4·8471600	70333·1	13·321
	XLIX	·27	52 58 26·45	4·7725122	59226·0	11·217		LVI	·20	56 22 50·52	4·7332002	54100·4	10·246
63	LI	·28	59 7 22·32	4·8039359	63670·2	12·059	75	LVIII	·20	48 13 2·23	4·6852442	48444·5	9·175
	LII	·28	67 54 11·23	4·8371805	68735·4	13·018		LIX	·20	75 24 7·25	4·7984423	62869·8	11·907
	XLIV	·25	46 30 49·31	4·7213968	52649·8	9·972		LIX	·20	62 9 11·99	4·7382616	54734·6	10·366
64	XLV	·25	61 21 42·26	4·8040638	63688·9	12·062	76	LVIII	·19	56 55 30·09	4·7149325	51871·9	9·824
	XLVII	·26	72 7 28·43	4·8392480	69063·4	13·080		LXI	·20	60 55 17·92	4·7332002	54100·4	10·246
	XLV	·25	73 42 2·88	4·8374121	68772·1	13·025		LVIII	·24	69 58 23·84	4·8169046	65600·1	12·424
65	XLVII	·24	59 0 31·76	4·7883330	61423·3	11·633	77	LXI	·24	58 24 22·56	4·7743222	59473·3	11·264
	XLIX	·24	47 17 25·36	4·7213968	52649·8	9·972		LXII	·24	51 37 13·60	4·7382616	54734·6	10·366
	XLVII	·31	54 52 37·74	4·8067442	64083·2	12·137		LVII	·19	64 23 25·74	4·7346350	54279·4	10·280
66	XLIX	·32	63 44 55·57	4·8467594	70268·3	13·308	78	LVIII	·18	60 44 4·80	4·7202420	52510·0	9·945
	L	·31	61 22 26·69	4·8374121	68772·1	13·025		LX	·18	54 52 29·46	4·6922424	49231·4	9·324
	XLIX	·26	55 41 43·18	4·7758111	59677·6	11·303		LVIII	·18	47 30 6·56	4·6633351	46061·2	8·724
67	L	·27	61 48 6·14	4·8039359	63670·2	12·059	79	LX	·19	72 10 23·51	4·7743222	59473·3	11·264
	LII	·27	62 30 10·68	4·8067442	64083·2	12·137		LXII	·19	60 19 29·93	4·7346350	54279·4	10·280
	LII	·24	55 22 58·05	4·7537243	56718·4	10·742		LXI	·30	59 46 44·10	4·8179696	65761·2	12·455
68	LI	·24	65 22 25·02	4·7969275	62650·9	11·866	80	LXII	·30	60 40 55·91	4·8218859	66356·9	12·568
	LIII	·24	59 14 36·93	4·7725122	59226·0	11·217		LXIII	·29	59 32 19·99	4·8169046	65600·1	12·424
	LI	·20	62 31 55·96	4·7447883	55563·3	10·523		LXII	·29	64 59 59·47	4·8320418	67926·9	12·865
69	LIII	·19	52 32 52·48	4·6964774	49713·9	9·416	81	LXIII	·28	53 40 6·87	4·7808880	60379·3	11·435
	LIV	·20	64 55 11·56	4·7537243	56718·4	10·742		LXV	·28	61 19 53·66	4·8179696	65761·2	12·455
	LIV	·31	64 55 5·81	4·8676236	73726·5	13·963		LXV	·22	56 25 4·43	4·7615541	57750·3	10·938
70	LIII	·31	72 2 11·25	4·8889333	77434·3	14·666	82	LXIII	·22	45 5 21·31	4·6910206	49093·1	9·298
	LVI	·30	43 2 42·94	4·7447883	55563·3	10·523		LXVII	·22	78 29 34·26	4·8320418	67926·9	12·865

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
		"	° ′ ″						"	° ′ ″			
	LXIII	·20	65 9 3·48	4·7606923	57635·8	10·916		LXXIII	·26	73 35 29·39	4·8479918	70468·0	13·346
83	LXVII	·20	49 27 4·15	4·6836138	48262·9	9·141	95	LXXII	·26	51 16 5·66	4·7581912	57304·8	10·853
	LXVI	·20	65 23 52·37	4·7615541	57750·3	10·938		LXXV	·26	55 8 24·95	4·7801570	60277·7	11·416
	LXI	·21	37 31 10·05	4·6274056	42403·9	8·031		LXXII	·31	47 27 50·09	4·7708429	58998·8	11·174
84	LXIII	·21	70 6 19·95	4·8160425	65470·0	12·400	96	LXXV	·31	70 52 56·69	4·8788250	75652·8	14·328
	LXIV	·21	72 22 30·00	4·8218859	66356·9	12·568		LXXIV	·31	61 39 13·22	4·8479918	70468·0	13·346
	LXIII	·15	66 26 47·05	4·6982550	49917·7	9·454		LXXII	·36	98 43 55·96	5·0155298	103640·6	19·629
85	LXIV	·15	62 24 42·04	4·6836138	48262·9	9·141	97	LXXIII	·35	46 10 40·12	4·8788250	75652·8	14·328
	LXVI	·14	51 8 30·91	4·6274056	42403·9	8·031		LXXIV	·35	35 5 23·92	4·7801570	60277·7	11·416
	LXVII	·38	83 5 39·24	4·9826046	96073·7	18·196		LXXV	·21	45 4 39·83	4·6784240	47689·6	9·032
86	LXVI	·38	60 21 11·56	4·9248322	84107·0	15·929	98	LXXIV	·22	73 45 41·63	4·8106700	64665·1	12·247
	LXIX	·38	36 33 9·20	4·7606923	57635·8	10·916		LXXVI	·21	61 9 38·54	4·7708429	58998·8	11·174
	LXVI	·16	23 49 29·59	4·7206329	52557·3	9·954		LXXIV	·17	72 34 7·62	4·7464497	55776·3	10·564
87	LXIX	·16	23 46 13·40	4·7196962	52444·0	9·933	99	LXXVI	·16	52 46 10·15	4·6678926	46547·1	8·816
	LXVIII	·16	132 24 17·01	4·9826046	96073·7	18·196		LXXVII	·17	54 39 42·23	4·6784240	47689·6	9·032
	LXVI	·24	84 10 41·45	4·8685588	73885·4	13·993		LXXVII	·40	76 58 9·49	4·9830763	96178·1	18·216
88	LXVII	·23	44 55 18·56	4·7196962	52444·0	9·933	100	LXXVI	·39	68 37 43·87	4·9634676	91932·2	17·411
	LXVIII	·24	50 53 59·99	4·7606923	57635·8	10·916		LXXIX	·39	34 24 6·64	4·7464497	55776·3	10·564
	LXVIII	·32	86 1 36·53	4·9540226	89954·4	17·037		LXXVI	·44	49 57 41·94	4·8755377	75082·3	14·220
89	LXIX	·32	58 19 16·09	4·8849996	76736·1	14·533	101	LXXIX	·44	51 18 18·87	4·8838938	76541·0	14·496
	LXX	·31	35 39 7·38	4·7206329	52557·3	9·954		LXXX	·45	78 43 59·19	4·9830763	96178·1	18·216
	LXIX	·18	30 27 21·98	4·7292814	53614·4	10·154		LXXV	·34	46 47 48·10	4·8242047	66712·1	12·635
90	LXX	·17	27 48 13·24	4·6931768	49337·5	9·344	102	LXXVI	·34	88 14 50·63	4·9613162	91477·9	17·325
	LXXI	·18	121 44 24·78	4·9540226	89954·4	17·037		LXXVIII	·34	44 57 21·27	4·8106700	64665·1	12·247
	LXVIII	·20	43 45 44·69	4·6931768	49337·5	9·344		LXXVI	·25	39 13 53·08	4·6899704	48974·6	9·275
91	LXIX	·21	88 46 38·36	4·8531793	71314·7	13·507	103	LXXVIII	·26	81 16 52·96	4·8838938	76541·0	14·496
	LXXI	·20	47 27 36·95	4·7206329	52557·3	9·954		LXXX	·25	59 29 13·96	4·8242047	66712·1	12·635
	LXXI	·36	79 51 23·50	4·9673729	92762·6	17·569		LXXX	·52	64 27 8·05	4·9698145	93285·6	17·668
92	LXX	·36	65 28 1·56	4·9331238	85728·2	16·236	104	LXXIX	·52	68 58 53·24	4·9845969	96515·5	18·279
	LXXIII	·35	34 40 34·94	4·7292814	53614·4	10·154		LXXXI	·51	46 33 58·71	4·8755377	75082·3	14·220
	LXX	·33	40 31 35·15	4·7801570	60277·7	11·416		LXXIX	·52	47 1 1·36	4·8794929	75769·2	14·350
93	LXXIII	·33	49 11 36·50	4·8464284	70214·8	13·298	105	LXXXI	·52	68 44 8·40	4·9846224	96521·1	18·281
	LXXII	·34	90 16 48·35	4·9573729	92762·6	17·569		LXXXII	·52	64 14 50·24	4·9698145	93285·6	17·668
	LXX	·29	105 59 37·11	4·9973586	99393·6	18·825		LXXXII	·38	72 16 27·77	4·9245048	84043·6	15·917
94	LXXI	·29	42 46 20·32	4·8464284	70214·8	13·298	106	LXXXI	·37	48 32 58·39	4·8204164	66132·7	12·525
	LXXII	·28	31 14 2·57	4·7292814	53614·4	10·154		LXXXV	·38	59 10 33·84	4·8794929	75769·2	14·350

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
		"	° ′ ″						"	° ′ ″			
	LXXXI	·35	43 33 44·89	4·7815071	60465·4	11·452		XCIII	·23	68 52 3·74	4·7979382	62796·9	11·893
107	LXXXV	·36	63 7 38·22	4·8935676	78265·0	14·823	119	XCII	·22	61 8 36·67	4·7705932	58964·9	11·168
	LXXXVI	·36	73 18 36·89	4·9245048	84043·6	15·917		XCV	·22	49 59 19·59	4·7123553	51565·0	9·766
	LXXX	·41	53 59 29·08	4·8953997	78595·9	14·886		XCII	·25	53 12 11·75	4·7548904	56870·9	10·771
108	LXXXI	·40	42 36 50·12	4·8181132	65782·9	12·459	120	XCV	·26	64 38 34·23	4·8073881	64178·3	12·155
	LXXXIII	·41	83 23 40·80	4·9845969	96515·5	18·279		XCVI	·25	62 9 14·02	4·7979382	62796·9	11·893
	LXXXI	·42	65 32 40·32	4·9165944	82526·7	15·630		XCI	·26	54 10 13·86	4·7672545	58513·3	11·082
109	LXXXIII	·41	54 21 7·68	4·8673022	73672·0	13·953	121	XCII	·27	65 7 18·75	4·8160659	65473·6	12·400
	LXXXIV	·42	60 6 12·00	4·8953997	78595·9	14·886		XCIV	·26	60 42 27·39	4·7989440	62942·5	11·921
	LXXXI	·31	44 25 36·29	4·7604073	57598·0	10·909		XCII	·25	59 15 43·92	4·7843315	60859·9	11·527
110	LXXXIV	·32	72 1 13·22	4·8935676	78265·0	14·823	122	XCIV	·26	65 0 35·15	4·8073881	64178·3	12·155
	LXXXVI	·32	63 33 10·49	4·8673022	73672·0	13·953		XCVI	·25	55 43 40·93	4·7672545	58513·3	11·082
	LXXXVI	·24	60 42 31·30	4·7753463	59613·7	11·290		XCV	·22	62 57 30·73	4·7676247	58563·2	11·092
111	LXXXV	·24	57 5 18·67	4·7587848	57383·2	10·868	123	XCVI	·22	57 9 55·96	4·7423079	55246·9	10·463
	LXXXVII	·24	62 12 10·03	4·7815071	60465·4	11·452		XCVII	·22	59 52 33·31	4·7548904	56870·9	10·771
	LXXXV	·22	60 31 21·76	4·7606972	57636·4	10·916		XCVI	·18	53 42 23·03	4·6948438	49527·2	9·380
112	LXXXVII	·22	55 15 52·08	4·7356644	54408·2	10·305	124	XCVII	·18	53 55 16·92	4·6960358	49663·3	9·406
	LXXXVIII	·23	64 12 46·16	4·7753463	59613·7	11·290		XCIX	·19	72 22 20·05	4·7676247	58563·2	11·092
	LXXXVIII	·20	60 7 20·41	4·7410829	55091·3	10·434		XCIX	·26	66 42 45·91	4·8383656	68923·2	13·054
113	LXXXVII	·20	54 45 47·79	4·7151208	51894·4	9·828	125	XCVII	·26	71 59 2·16	4·8534369	71357·1	13·515
	XC	·21	65 6 51·80	4·7606972	57636·4	10·916		CI	·25	41 18 11·93	4·6948438	49527·2	9·380
	LXXXVII	·22	68 14 1·18	4·7899533	61652·9	11·677		XCVII	·29	49 9 49·37	4·7673567	58527·1	11·085
114	XC	·22	55 40 53·73	4·7390126	54829·3	10·384	126	CI	·30	67 50 26·01	4·8551769	71643·5	13·569
	XCI	·22	56 5 5·09	4·7410829	55091·3	10·434		C	·29	62 59 44·62	4·8383656	68923·2	13·054
	LXXXVI	·19	58 3 12·46	4·7195095	52421·5	9·928		XCV	·25	58 46 38·51	4·7789988	60117·2	11·386
115	LXXXVII	·19	53 41 21·30	4·6970726	49782·0	9·428	127	XCVII	·25	69 25 13·77	4·8183134	65813·3	12·465
	LXXXIX	·19	68 15 26·24	4·7587848	57383·2	10·868		XCVIII	·24	51 48 7·72	4·7423079	55246·9	10·463
	LXXXVII	·21	65 50 46·34	4·7658712	58327·2	11·047		XCVII	·28	55 38 2·99	4·7946662	62325·6	11·804
116	LXXXIX	·21	59 3 45·52	4·7390126	54829·3	10·384	128	XCVIII	·28	71 35 48·69	4·8551769	71643·5	13·569
	XCI	·20	55 5 28·14	4·7195095	52421·5	9·928		C	·28	52 46 8·32	4·7789988	60117·2	11·386
	XCI	·26	58 31 29·86	4·7847173	60914·0	11·537		C	·51	65 38 2·92	5·0433392	110494·1	20·927
117	XC	·26	61 47 44·96	4·7989440	62942·5	11·921	129	CI	·51	85 31 0·05	5·0825235	120927·1	22·903
	XCII	·26	59 40 45·18	4·7899533	61652·9	11·677		CII	·50	28 50 57·03	4·7673567	58527·1	11·085
	XC	·21	51 15 57·49	4·7123553	51565·0	9·766		CI	·30	30 29 6·06	4·7902334	61692·7	11·684
118	XCII	·22	61 35 22·26	4·7644941	58142·6	11·012	130	CII	·31	34 49 48·62	4·8417045	69455·2	13·154
	XCIII	·22	67 8 40·25	4·7847173	60914·0	11·537		CIII	·31	114 41 5·32	5·0433392	110494·1	20·927

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
		"	° ′ ″						"	° ′ ″			
	C	·29	35 3 11·35	4·8417045	69455·2	13·154		CVII	·47	91 21 2·91	5·0470922	111453·1	21·109
131	CI	·29	116 0 6·63	5·0361917	108690·5	20·585	137	CVI	·46	51 23 7·24	4·9400646	87109·3	16·498
	CIII	·28	28 56 42·02	4·7673567	58527·1	11·085		(XXIII)	·46	37 15 49·85	4·8293173	67502·1	12·784
	CIII	·32	67 2 38·42	4·8676934	73738·3	13·966		CVI	·69	46 36 4·13	4·9388102	86858·1	16·450
132	CII	·32	62 34 3·23	4·8517211	71075·7	13·461	138	(XXIII)	·69	64 35 51·36	5·0333621	107984·7	20·452
	CV	·31	50 23 18·35	4·7902334	61692·7	11·684		(XXV)	·69	68 48 4·51	5·0470922	111453·1	21·109
	CII	·27	62 12 19·85	4·8298127	67579·1	12·799		CV	·41	37 2 26·65	4·8100828	64577·7	12·231
133	CV	·26	42 56 35·26	4·7163736	52044·4	9·857	139	CVI	·42	49 37 42·50	4·9120855	81674·3	15·469
	CIV	·27	74 51 4·89	4·8676934	73738·3	13·966		CVIII	·42	93 19 50·85	5·0294760	107022·7	20·269
	CII	·21	124 46 23·46	5·0038093	100881·0	19·106		CVI	·40	66 57 51·80	4·9293276	84982·1	16·095
134	CIII	·20	25 4 21·62	4·7163736	52044·4	9·857	140	CVIII	·41	68 39 51·65	4·9345827	86016·7	16·291
	CIV	·21	30 9 14·92	4·7902334	61692·7	11·684		CIX	·40	44 22 16·55	4·8100828	64577·7	12·231
	CV	·49	58 33 4·18	4·9640410	92053·6	17·434		CVI	·39	32 15 32·48	4·7625264	57879·7	10·962
135	CIV	·49	82 40 19·07	5·0294760	107022·7	20·269	141	CIX	·39	95 15 13·50	5·0333621	107984·7	20·452
	CVI	·48	38 46 36·75	4·8298127	67579·1	12·799		(XXV)	·39	52 29 14·02	4·9345827	86016·7	16·291
	CIV	·47	41 20 42·01	4·8293173	67502·1	12·784							
136	CVI	·48	74 23 1·78	4·9930496	98412·3	18·639							
	CVII	·47	64 16 16·21	4·9640410	92053·6	17·434							

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

J. B. N. HENNESSEY.

KARACHI LONGITUDINAL 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 (III) and (IV) of the Sironj base-line figure and I, II, the initial stations of the series, and thence through the triangulation westwards to the stations (XXIII) and (XXV) of the Karáchi base-line figure; 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 21—*B.* 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* for Height of the station pillar or tower in feet.

A description of the exact point referred to by spirit leveling will be found in a foot note on page 35—*B.*; 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
	° ′ ″			° ′ ″	
(III)	I 40 38 11·30	1	I	II 39 14 31·86	4
λ 24 14 20·42	IV 104 16 34·39	2	λ 24 6 19·17	III 90 40 18·10	3
L 77 43 11·09	(IV) 351 28 10·25	1	L 77 35 41·29	IV 149 5 50·46	2
H_s 1802·19			H 1749	(III) 220 35 7·11	1
h †			*h* 15	(IV) 305 52 57·30	1
(IV)	II 80 52 4·61	4	II	III 147 39 34·67	5
λ 23 59 44·93	I 125 56 58·87	1	λ 23 57 3·35	I 219 11 10·79	4
L 77 45 34·03	(III) 171 29 8·67	1	L 77 27 27·46	(IV) 260 44 43·13	4
H 1780			H 1811		
h 10			*h* 4		

† Not forthcoming.

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
III		VI	78 2 32·14	7
	λ 24 6 27·97	V	159 15 12·62	6
	L 77 20 57·88	IV	210 9 6·08	3
	H 1776	I	270 34 17·29	3
	h 5	II	327 36 56·03	5
IV		III	30 12 3·29	3
	λ 24 17 49·79	V	73 11 53·64	6
	L 77 28 10·14	VII	139 21 52·23	9
	H 1842	(III)	284 10 24·09	2
	h 5	I	329 2 45·51	2
V		VI	37 11 37·66	7
	λ 24 14 52·08	VIII	117 0 50·86	8
	L 77 17 29·59	VII	175 58 10·89	9
	H 1834	IV	253 7 30·33	6
	h 3	III	339 13 47·32	6
VI		X	61 15 29·91	17
	λ 24 4 2·62	IX	110 46 7·29	11
	L 77 8 33·01	VIII	160 15 42·02	8
	H 1736	V	217 7 58·07	7
	h 4	III	257 57 28·14	7
VII		VIII	59 23 27·65	10
	λ 24 30 29·18	IV	319 16 57·78	9
	L 77 16 17·43	V	355 57 41·10	9
	H 1822			
	h 6			
VIII		IX	68 0 22·56	11
	λ 24 22 23·15	XI	111 15 57·22	12
	L 77 1 21·84	VII	239 17 17·10	10
	H 1682	V	296 54 12·45	8
	h 4	VI	340 12 45·13	8
IX		XII	32 46 15·02	18
	λ 24 14 10·67	XIII	102 11 13·75	13
	L 76 39 16·38	XI	181 31 34·62	12
	H 1645	VIII	247 51 17·01	11
	h 4	VI	290 34 8·54	11
		X	359 41 25·99	17
X		XII	112 35 38·72	18
	λ 23 49 18·04	IX	179 41 29·57	17
	L 76 39 25·14	VI	241 3 40·53	17
	H 1601			
	h 3			

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XI		IX	1 31 46·07	12
	λ 24 30 3·74	XIII	52 12 58·85	13
	L 76 39 44·13	XIV	103 50 54·64	14
	H 1437	VIII	291 7 0·37	12
	h 4			
XII		XV	118 40 45·41	20
	λ 23 54 35·44	XIII	172 14 26·03	19
	L 76 25 33·84	IX	212 40 39·50	18
	H 1628	X	292 30 2·36	18
	h 4			
XIII		XV	65 3 9·46	16
	λ 24 17 33·06	XVI	120 47 59·40	15
	L 76 22 9·03	XIV	168 55 43·76	14
	H 1441	XI	232 5 43·03	13
	h 8	IX	282 4 11·57	13
		XII	352 13 2·41	19
XIV		XVI	47 13 14·43	15
	λ 24 34 50·10	XI	283 42 4·23	14
	L 76 18 27·11	XIII	348 54 11·95	14
	H 1463			
	h 4			
XV		XVII	117 55 49·55	21
	λ 24 7 45·23	XVIII	160 47 38·89	23
	L 75 59 16·08	XVI	202 55 54·97	16
	H 1622	XIII	244 53 46·42	16
	h 3	XII	298 30 3·19	20
XVI		XV	22 59 17·78	16
	λ 24 25 32·46	XVII	60 16 11·18	21
	L 76 7 29·34	XVIII	112 7 38·07	22
	H 1360	XIV	227 8 41·62	15
	h 5	XIII	300 41 56·57	15
XVII		XIX	78 9 0·04	24
	λ 24 14 13·63	XX	133 41 56·15	26
	L 75 45 55·89	XVIII	191 53 10·67	22
	H 1582	XVI	240 7 18·26	21
	h 3	XV	297 50 21·75	21
XVIII		XVII	11 54 52·09	22
	λ 24 32 1·18	XIX	38 19 25·47	24
	L 75 50 1·55	XX	80 14 10·75	25
	H 1659	XVI	292 0 23·89	22
	h 9	XV	340 43 50·41	23

NOTE.—The Station (III) appertains to the Sironj base-line figure.

Station and its co-ordinates		Azimuths of surrounding stations	° ′ ″	Reference to triangle containing distance
XIX	° ′ ″	XXI	97 25 21·52	27
λ	24 11 37·54	XXII	144 59 28·94	29
L	75 32 27·93	XX	170 27 39·65	25
H	1591	XVIII	218 12 10·83	24
h	1	XVII	258 3 28·63	24
XX		XXI	49 36 0·22	27
λ	24 28 44·16	XXII	105 16 47·31	28
L	75 29 19·42	XVIII	260 5 35·52	25
H	1920	XVII	313 35 5·17	26
h	7	XIX	350 26 21·97	25
XXI		XXIV	68 14 49·77	31
λ	24 14 11·86	XXIII	142 27 54·77	30
L	75 10 43·06	XXII	198 4 59·71	28
H	1525	XX	229 28 19·80	27
h	5	XIX	277 16 26·32	27
XXII		XXI	18 7 35·42	28
λ	24 31 48·39	XXIII	64 45 23·68	30
L	75 17 0·22	XXVI	108 22 37·80	34
H	1860	XX	285 11 40·71	28
h	8	XIX	324 53 6·27	29
XXIII		XXIV	4 33 49·82	31
λ	24 25 7·27	XXV	55 52 11·22	32
L	75 1 32·87	XXVI	157 44 29·72	33
H	1532	XXII	244 38 59·49	30
h	6	XXI	322 24 8·12	30
XXIV		XXV	125 50 34·45	32
λ	24 10 21·90	XXIII	184 33 18·12	31
L	75 0 15·84	XXI	248 10 32·62	31
H	1804			
h	3			
XXV		XXVII	109 43 47·13	36
λ	24 17 33·54	XXVIII	153 28 46·96	35
L	74 49 23·29	XXVI	195 28 59·20	33
H	1855	XXIII	235 47 10·34	32
h	5	XXIV	305 46 6·62	32
XXVI		XXV	15 31 35·12	33
λ	24 38 15·67	XXVII	55 51 27·48	37
L	74 55 39·78	XXVIII	104 44 31·53	35
H	1951	XXII	288 13 45·10	34
h	7	XXIII	337 42 3·14	33

Station and its co-ordinates		Azimuths of surrounding stations	° ′ ″	Reference to triangle containing distance
XXVII	° ′ ″	XXX	80 50 14·69	39
λ	24 23 21·01	XXIX	140 15 11·65	38
L	74 31 42·24	XXVIII	189 46 11·61	36
H	1954	XXVI	235 41 31·03	37
h	2	XXV	289 36 29·80	36
XXVIII		XXVII	9 47 44·45	36
λ	24 43 6·11	XXIX	89 58 14·24	38
L	74 35 25·66	XXXI	148 53 43·96	42
H	1910	XXVI	284 36 4·61	35
h	3	XXV	333 22 59·52	35
XXIX		XXXII	60 19 35·48	40
λ	24 43 3·93	XXXIII	123 54 49·67	41
L	74 13 44·30	XXXI	190 3 29·01	42
H	2089	XXVIII	269 49 10·08	38
h	3	XXVII	320 7 43·72	38
		XXX	356 55 39·88	39
XXX		XXXII	117 38 44·32	40
λ	24 20 52·34	XXIX	176 56 12·27	39
L	74 15 2·32	XXVII	260 43 22·13	39
H	1599			
h	4			
XXXI		XXIX	10 5 33·71	42
λ	25 8 22·17	XXXIII	61 20 31·62	43
L	74 18 40·16	XXVIII	328 46 40·15	42
H	2262			
h	3			
XXXII		XXXV	70 37 56·13	45
λ	24 31 47·99	XXXIV	142 42 2·35	44
L	73 52 10·41	XXXIII	182 14 0·94	41
H	2574	XXIX	240 10 36·37	40
h	3	XXX	297 29 16·73	40
XXXIII		XXXII	2 14 26·53	41
λ	24 55 38·24	XXXIV	56 15 30·83	44
L	73 53 11·59	XXXVI	106 4 24·19	48
H	2369	XXXI	241 9 44·80	43
h	3	XXIX	303 46 12·16	41
XXXIV		XXXV	10 15 51·05	45
λ	24 47 10·58	XXXVII	51 29 45·84	46
L	73 39 20·09	XXXVIII	124 46 56·69	47
H	3577	XXXVI	178 20 50·42	48
h	3	XXXIII	236 9 41·31	44
		XXXII	322 36 40·97	44

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XXXV	° ′ ″	XXXVII	123 1 51·22	46
λ	24 26 19·52	XXXIV	190 14 7·98	45
L	73 35 12·62	XXXII	250 30 54·31	45
H	3433			
h	3			
XXXVI		XXXVIII	86 52 43·30	49
λ	24 59 21·99	XXXIII	285 58 23·56	48
L	73 38 56·93	XXXIV	358 20 40·67	48
H	3876			
h	3			
XXXVII		XL	63 8 54·87	51
λ	24 34 20·39	XXXIX	144 3 22·91	50
L	73 21 42·82	XXXVIII	179 26 3·90	47
H	3827	XXXIV	231 22 24·39	46
h	3	XXXV	302 56 15·33	46
XXXVIII		XXXIX	37 31 31·35	50
λ	24 58 28·78	XLI	102 23 21·79	55
L	73 21 27·13	XXXVI	266 45 19·93	49
H	3607	XXXIV	304 39 25·27	47
h	3	XXXVII	359 25 57·33	47
XXXIX		XL	25 38 22·92	51
λ	24 46 54·71	XLII	69 3 4·34	52
L	73 11 43·48	XLI	137 0 40·24	55
H	3599	XXXVIII	217 27 25·81	50
h	6	XXXVII	323 59 12·68	50
XL		XLIII	92 1 19·17	53
λ	24 24 9·27	XLII	146 37 36·53	52
L	72 59 48·01	XXXIX	205 33 25·17	51
H	3080	XXXVII	242 59 49·89	51
h	4			
XLI		XLII	10 54 41·14	56
λ	25 3 51·50	XLIV	55 4 15·67	57
L	72 54 21·85	XXXVIII	282 11 54·41	55
H	2098	XXXIX	316 53 21·29	55
h	3			
XLII		XLIII	47 27 34·79	53
λ	24 38 58·39	XLIV	112 2 17·42	54
L	72 49 6·91	XLI	190 52 28·75	56
H	5650	XXXIX	248 53 37·13	52
h	4	XL	326 33 10·40	52

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XLIII	° ′ ″	XLVI	96 6 47·32	59
λ	24 24 59·77	XLV	138 17 41·26	58
L	72 32 29·86	XLIV	168 45 47·52	54
H	3575	XLII	227 20 40·79	53
h	0	XL	271 50 2·18	53
XLIV		XLV	56 7 21·89	58
λ	24 46 50·77	XLVII	102 38 11·45	64
L	72 27 44·54	XLI	234 53 2·57	57
H	3252	XLII	291 53 21·25	54
h	3	XLIII	348 43 48·75	54
XLV		XLVI	6 59 8·96	59
λ	24 40 29·02	XLVIII	39 15 20·48	60
L	72 17 22·84	XLIX	100 59 16·18	61
H	1809	XLVII	174 41 19·31	64
h	0	XLIV	236 3 1·82	58
		XLIII	318 11 24·48	58
XLVI		XLVIII	121 43 12·01	60
λ	24 26 38·64	XLV	186 58 22·76	59
L	72 15 31·69	XLIII	275 59 46·22	59
H	673			
h	9			
XLVII		XLIX	53 41 29·17	65
λ	24 49 8·38	L	108 34 7·22	66
L	72 16 29·94	XLIV	282 33 28·49	64
H	1459	XLV	354 40 57·17	64
h	2			
XLVIII		LI	118 14 32·00	62
λ	24 30 35·36	XLIX	170 55 55·85	61
L	72 8 32·81	XLV	219 11 39·91	60
H	625	XLVI	301 40 18·47	60
h	6			
XLIX		LI	61 12 11·37	62
λ	24 42 24·61	LII	114 10 38·09	63
L	72 6 28·89	L	169 52 21·53	66
H	652	XLVII	233 37 17·41	65
h	3	XLV	280 54 43·01	61
		XLVIII	350 55 4·25	61
L		LII	51 39 36·62	67
λ	24 52 49·57	XLVII	288 29 3·20	66
L	72 4 26·52	XLIX	349 51 30·21	66
H	456			
h	3			

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
LI	° ′ ″	LIV	54 5 54·96	69
λ	24 36 56·19	LIII	116 37 51·12	68
L	71 55 36·09	LII	182 0 16·38	63
H	362	XLIX	241 7 38·98	62
h	8	XLVIII	298 9 9·12	62
LII		LI	2 0 25·78	63
λ	24 46 42·58	LIII	57 23 24·07	68
L	71 55 58·57	LV	111 37 42·25	72
H	323	L	231 36 3·32	67
h	6	XLIX	294 6 14·27	63
LIII		LVI	61 9 6·04	70
λ	24 41 7·79	LVII	121 58 36·08	71
L	71 46 26·31	LV	173 52 8·46	72
H	221	LII	237 19 24·65	68
h	15	LI	296 34 1·81	68
		LIV	349 6 54·48	69
LIV		LVI	104 12 35·69	70
λ	24 32 7·21	LIII	169 7 41·81	69
L	71 48 19·95	LI	234 2 53·57	69
H	290			
h	12			
LV		LVII	64 31 24·75	73
λ	24 50 33·33	LII	291 33 14·18	72
L	71 45 19·73	LIII	353 51 40·57	72
H	161			
h	6			
LVI		LIX	88 49 53·09	75
λ	24 35 14·92	LVIII	145 12 43·81	74
L	71 34 46·61	LVII	188 8 17·60	71
H	162	LIII	241 4 14·37	70
h	25	LIV	284 6 57·61	70
LVII		LVI	8 9 2·72	71
λ	24 46 44·68	LVIII	68 34 38·15	74
L	71 36 34·66	LX	132 58 4·08	78
H	132	LV	244 27 44·41	73
h	2	LIII	301 54 28·54	71
LVIII		LIX	13 23 3·90	75
λ	24 43 46·31	LXI	70 18 34·18	76
L	71 28 17·52	LXII	140 16 58·26	77
H	92	LX	187 47 5·00	78
h	14	LVII	248 31 9·99	74
		LVI	325 10 1·47	74

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
LIX	° ′ ″	LXI	131 12 55·10	76
λ	24 35 4·88	LVIII	193 22 7·29	75
L	71 26 1·83	LVI	268 46 14·74	75
H	134			
h	1			
LX		LVIII	7 47 38·50	78
λ	24 52 39·08	LXII	79 58 2·20	79
L	71 29 37·37	LVII	312 55 8·86	78
H	180			
h	6			
LXI		LXIV	94 32 23·18	84
λ	24 40 43·31	LXIII	132 3 33·44	80
L	71 18 58·74	LXII	191 50 17·85	77
H	56	LVIII	250 14 40·65	76
h	8	LIX	311 9 58·77	76
LXII		LXI	11 51 19·06	77
λ	24 51 19·36	LXIII	72 32 15·27	80
L	71 21 24·87	LXV	137 32 15·02	81
H	212	LX	259 54 35·10	79
h	2	LVIII	320 14 5·22	77
LXIII		LXIV	22 6 9·81	84
λ	24 48 3·43	LXVI	88 32 57·01	83
L	71 10 4·02	LXVII	153 42 0·69	82
H	269	LXV	198 47 22·23	81
h	†	LXII	252 27 29·38	80
		LXI	311 59 49·66	80
LXIV		LXVI	139 40 15·19	85
λ	24 41 34·19	LXIII	202 4 57·38	84
L	71 7 11·00	LXI	274 27 27·60	84
H	100			
h	4			
LXV		LXIII	18 49 2·31	81
λ	24 58 40·45	LXVII	75 14 6·95	82
L	71 14 1·82	LXII	317 29 8·37	81
H	428			
h	†			
LXVI		LXVIII	118 54 43·12	87
λ	24 47 51·07	LXIX	142 44 12·88	86
L	71 1 20·38	LXVII	203 5 24·81	83
H	374	LXIII	268 29 17·38	83
h	3	LXIV	319 37 48·43	85

† Not forthcoming.

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
LXVII	° ′ ″	LXVI	23 7 8·11	83
λ	24 56 36·25	LXVIII	68 2 26·90	88
L	71 5 25·99	LXIX	106 12 47·72	86
H	460	LXV	255 10 29·27	82
h	3	LXIII	333 40 3·75	82
LXVIII		LXX	80 25 19·74	89
λ	24 52 2·03	LXXI	122 41 11·70	91
L	70 53 1·85	LXIX	166 26 56·59	87
H	492	LXVII	247 57 13·53	88
h	3	LXVI	298 51 13·76	87
LXIX		LXX	44 45 16·55	89
λ	25 0 28·18	LXXI	75 12 38·71	90
L	70 50 47·97	LXVII	286 6 37·00	86
H	595	LXVI	322 39 46·58	86
h	3	LXVIII	346 26 0·14	87
LXX		LXXII	90 52 36·04	93
λ	24 49 54·91	LXXIII	131 24 11·52	92
L	70 39 20·39	LXXI	196 52 13·43	90
H	512	LXIX	224 40 26·84	89
h	3	LXVIII	260 19 34·53	89
LXXI		LXX	16 53 24·64	90
λ	24 58 23·16	LXXII	59 39 45·25	94
L	70 42 9·50	LXXIII	96 44 48·50	92
H	588	LXIX	255 8 59·68	90
h	3	LXVIII	302 36 36·83	91
LXXII		LXXIV	81 46 30·91	96
λ	24 50 5·01	LXXV	129 14 21·31	95
L	70 26 38·20	LXXIII	180 30 27·23	93
H	520	LXXI	239 33 13·08	94
h	3	LXX	270 47 15·93	93
LXXIII		LXXII	0 30 29·67	93
λ	25 0 2·14	LXXIV	46 41 10·15	97
L	70 26 44·00	LXXV	74 5 59·32	95
H	539	LXXI	276 38 17·56	92
h	9	LXX	311 18 52·85	92
LXXIV		LXXVII	53 41 46·58	99
λ	24 48 17·18	LXXVI	126 15 54·38	98
L	70 13 5·51	LXXV	200 1 36·23	96
H	485	LXXIII	226 35 25·50	97
h	6	LXXII	261 40 49·76	96

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
LXXV	° ′ ″	LXXIV	20 3 8·61	96
λ	24 57 26·28	LXXVI	65 7 48·65	98
L	70 16 45·08	LXXVIII	111 55 37·09	102
H	518	LXXIII	254 1 46·40	95
h	3	LXXII	309 10 11·62	95
LXXVI		LXXIX	67 36 53·50	100
λ	24 52 56·48	LXXX	117 34 35·87	101
L	70 6 7·90	LXXVIII	156 48 29·20	102
H	474	LXXV	245 3 20·17	98
h	3	LXXIV	306 12 58·93	98
		LXXVII	358 59 9·23	99
LXXVII		LXXIX	102 1 3·84	100
λ	24 43 44·01	LXXVI	178 59 13·72	99
L	70 6 18·61	LXXIV	233 38 56·12	99
H	382			
h	3			
LXXVIII		LXXX	58 3 21·82	103
λ	25 3 3·89	LXXV	291 49 6·99	102
L	70 1 22·18	LXXVI	336 46 28·60	102
H	408			
h	3			
LXXIX		LXXXII	80 11 53·27	105
λ	24 46 52·76	LXXXI	127 12 55·14	104
L	69 50 2·84	LXXX	196 11 48·90	101
H	479	LXXVI	247 30 8·21	100
h	3	LXXVII	281 54 15·24	100
LXXX		LXXIX	16 13 24·67	101
λ	24 58 47·00	LXXXI	80 40 33·24	104
L	69 53 50·48	LXXXIII	134 40 2·73	108
H	349	LXXVIII	238 0 10·82	103
h	3	LXXVI	297 29 25·03	101
LXXXI		LXXXII	15 51 24·73	105
λ	24 56 11·09	LXXXV	64 24 23·49	106
L	69 36 35·65	LXXXVI	107 58 8·73	107
H	278	LXXXIV	152 23 45·32	109
h	3	LXXXIII	217 56 26.07	108
		LXXX	260 33 16·59	104
		LXXIX	307 7 15·81	104
LXXXII		LXXXV	123 33 22·25	106
λ	24 44 8·98	LXXXI	195 49 50·40	105
L	69 32 51·07	LXXIX	260 4 41·17	105
H	302			
h	3			

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
LXXXIII	° ′ ″	LXXXI	38 0 8·46	108
λ	25 6 24·88	LXXXIV	92 21 16·55	109
L	69 45 21·44	LXXX	314 36 27·25	108
H	333			
h	3			
LXXXIV		LXXXVI	44 22 21·73	110
λ	25 6 57·72	LXXXIII	272 14 55·77	109
L	69 30 24·20	LXXXI	332 21 8·19	109
H	46			
h	20			
LXXXV		LXXXVIII	63 34 17·72	112
λ	24 50 10·79	LXXXVII	124 5 39·70	111
L	69 22 52·74	LXXXVI	181 10 58·62	107
H	44	LXXXI	244 18 37·19	106
h	20	LXXXII	303 29 11·42	106
LXXXVI		LXXXV	1 11 4·33	107
λ	25 0 9·68	LXXXVII	61 53 35·87	111
L	69 23 6·31	LXXXIX	119 56 48·52	115
H	47	LXXXIV	224 19 16·27	110
h	24	LXXXI	287 52 27·08	107
LXXXVII		XC	54 3 34·32	113
λ	24 55 41·58	XCI	122 17 35·72	114
L	69 13 56·39	LXXXIX	188 8 22·27	115
H	58	LXXXVI	241 49 43·76	111
h	15	LXXXV	304 1 54·03	111
		LXXXVIII	359 17 46·33	112
LXXXVIII		XC	119 10 28·95	113
λ	24 46 10·63	LXXXVII	179 17 49·56	112
L	69 14 4·07	LXXXV	243 30 35·95	112
H	49			
h	20			
LXXXIX		LXXXVII	8 8 56·39	115
λ	25 4 15·66	XCI	67 12 42·12	116
L	69 15 17·12	LXXXVI	299 53 29·96	115
H	54			
h	10			
XC		XCIII	65 15 33·69	118
λ	24 50 21·02	XCII	116 31 31·39	117
L	69 5 52·13	XCI	178 19 16·61	114
H	56	LXXXVII	234 0 10·56	113
h	20	LXXXVIII	299 7 2·57	113

Station and its co-ordinates		Azimuths of surrounding stations		Reference to triangle containing distance
			° ′ ″	
XCI	° ′ ″	XCII	56 50 38·45	117
λ	25 0 31·53	XCIV	111 0 52·57	121
L	69 5 32·50	LXXXIX	247 8 34·68	116
H	63	LXXXVII	302 14 3·02	114
h	15	XC	358 19 8·33	114
XCII		XCV	59 11 21·68	119
λ	24 54 50·20	XCVI	112 23 33·68	120
L	68 56 0·05	XCIV	171 39 17·85	121
H	72	XCI	236 46 36·87	117
h	24	XC	296 27 22·31	117
		XCIII	358 2 44·79	118
XCIII		XCV	109 10 48·84	119
λ	24 46 19·65	XCII	178 2 52·81	118
L	68 56 19·13	XC	245 11 33·28	118
H	59			
h	12			
XCIV		XCVI	56 39 14·23	122
λ	25 4 23·72	XCI	290 56 11·18	121
L	68 54 27·68	XCII	351 38 38·82	121
H	93			
h	15			
XCV		XCVIII	52 44 31·25	127
λ	24 49 31·23	XCVII	111 31 10·01	123
L	68 46 14·56	XCVI	174 28 40·96	120
H	67	XCII	239 7 15·45	119
h	32	XCIII	289 6 35·26	119
XCVI		XCVII	51 38 12·09	123
λ	24 58 52·01	XCIX	105 20 35·30	124
L	68 45 15·08	XCIV	236 35 20·46	122
H	78	XCII	292 19 1·64	120
h	38	XCV	354 28 15·91	120
XCVII		XCVIII	0 52 29·42	127
λ	24 52 51·71	C	56 30 32·69	126
L	68 36 56·38	CI	105 40 22·35	125
H	83	XCIX	177 39 24·77	124
h	18	XCVI	231 34 41·87	123
		XCV	291 27 15·40	123
XCVIII		C	109 16 36·28	128
λ	24 42 56·21	XCVII	180 52 25·25	127
L	68 36 46·42	XCV	232 40 33·20	127
H	73			
h	20			

Station and its co-ordinates	Azimuths of surrounding stations		Reference to triangle containing distance
		° ′ ″	
XCIX	CI	64 22 1·65	125
λ 25 1 1·94	XCVI	285 16 55·24	124
L 68 36 34·36	XCVII	357 39 15·48	124
H 88			
h 37			
C	CII	107 48 12·13	129
λ 24 46 19·67	CIII	138 23 3·91	131
L 68 26 8·04	CI	173 26 15·55	126
H 72	XCVII	236 26 0·46	126
h 44	XCVIII	289 12 9·07	128
CI	CII	78 56 45·57	129
λ 24 55 55·68	CIII	109 25 51·93	130
L 68 24 55·36	XCIX	244 17 6·52	125
H 88	XCVII	285 35 18·70	125
h 42	C	353 25 45·01	126
CII	CIV	99 12 17·07	133
λ 24 52 24·51	CV	161 24 37·19	132
L 68 5 17·67	CIII	223 58 40·74	130
H 121	CI	258 48 29·67	129
h 3	C	287 39 27·20	129
CIII	CII	44 1 57·06	130
λ 24 59 44·11	CIV	69 6 18·88	134
L 68 13 3·35	CV	111 4 35·80	132
H 174	CI	289 20 51·43	130
h 3	C	318 17 33·73	130
CIV	CVII	80 16 15·05	136
λ 24 53 46·69	CVI	121 36 57·53	135
L 67 55 59·65	CV	204 17 17·09	133
H 260	CIII	248 59 7·12	134
h 3	CII	279 8 22·25	133
CV	CIV	24 19 24·77	133
λ 25 3 56·83	CVI	82 52 29·44	135
L 68 1 1·99	CVIII	119 54 56·50	139
H 230	CIII	290 59 30·59	132
h 3	CII	341 22 49·25	132

Station and its co-ordinates	Azimuths of surrounding stations		Reference to triangle containing distance
		° ′ ″	
CVI	CVII	15 54 0·05	136
λ 25 1 44·08	(XXIII)	67 17 7·76	137
L 67 41 47·26	(XXV)	113 53 12·57	138
H 1456	CIX	146 8 45·44	140
h 3	CVIII	213 6 37·64	139
	CV	262 44 20·56	135
	CIV	301 30 57·79	135
CVII	(XXIII)	104 31 32·01	137
λ 24 51 0·90	CVI	195 52 35·39	136
L 67 38 26·47	CIV	260 8 52·07	136
H 445			
h 3			
CVIII	CVI	33 9 20·58	139
λ 25 10 39·79	CIX	101 49 12·63	140
L 67 48 11·30	CV	299 49 29·31	139
H 824			
h 3			
CIX	(XXV)	61 20 17·73	141
λ 25 13 31·47	CVIII	281 42 46·89	140
L 67 33 5·39	CVI	326 · 5 3·84	140
H 1135			
h 3			
(XXIII)	(XXV)	182 33 24·25	138
λ 24 54 36·57	CVI	247 9 16·30	137
L 67 23 10·44	CVII	284 25 6·61	137
H 491			
h 3			
(XXV)	(XXIII)	2 33 42·09	138
λ 25 8 56·17	CIX	241 16 22·48	141
L 67 23 52·61	CVI	293 45 36·89	138
H 1091			
h 3			

When determining the spirit leveled height of (III) or Súrantál Hill Station, given on page 28—B., the leveling staff stood on the mark-stone let into the upper surface of the pillar.

NOTE.—The stations (XXIII) and (XXV) appertain to the Karáchi base-line figure.

J. B. N. HENNESSEY.

KARACHI LONGITUDINAL 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	No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles					Log. feet	Feet	Miles	
		° ′ ″				Inch			° ′ ″				Inch
	(III)	82 31 55	4·926099	84353	15·976	36		III	95 1 10	4·924940	84128	15·933	36
142	I	48 41 42	4·805558	63908	12·104	,,	147	V	44 51 57	4·775075	59576	11·283	,,
	Tánk s. (D)		4·806077	63985	12·118			Deobárí h.s.		4·735711	54414	10·306	
	(III)	18 53 32	4·516727	32864	6·224	,,		III	31 21 4	4·715238	51908	9·831	,,
143	IV	39 1 25	4·805558	63908	12·104	,,	148	VI	13 39 26	4·372120	23557	4·462	,,
	Tánk s. (D)		4·934486	85998	16·287			Naya Kila Mark		4·848548	70558	13·363	
	(III)	42 56 49	4·767956	58608	11·100	,,		IV	72 17 1	4·569660	37124	7·031	,,
144	IV	48 23 27	4·808327	64317	12·181	,,	149	Tánk s.	50 13 46	4·476468	29955	5·673	7
	Sarái h.s.		4·934486	85998	16·287			Araun Temple (E)		4·516727	32864	6·224	
	(III)	40 35 2	4·768503	58682	11·114	,,		IV	44 19 44	4·630749	42732	8·093	36
145	IV	66 58 42	4·919172	83018	15·723	,,	150	Sonárí h.s.	29 19 49	4·476468	29955	5·673	7
	Sonárí h.s. (E)		4·934486	85998	16·287			Araun Temple (E)		4·768503	58682	11·114	
	IV	18 35 15	4·277425	18942	3·587	,,		IV	34 24 4	4·524875	33487	6·342	36
146	Sarái h.s.	80 55 37	4·768503	58682	11·114	7	151	Sonárí h.s.	63 40 55	4·725316	53127	10·062	7
	Sonárí ,, (E)		4·767956	58608	11·100			Panwárí Temple		4·768503	58682	11·114	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Saráí h.s.	42 16 58	4·112033	12943	2·451	7
152	Sonárí „	57 46 35	4·211510	16275	3·082	„
	Salaun Masjid		4·277425	18942	3·587	
	IV		4·565909	36805	6·971	
153	VII	109 23 10	5·073661	118484	22·440	36
	Jaynagar s. (E)	53 34 30	5·004609	101067	19·141	7
	V		4·565909	36805	6·971	
154	VII	146 3 53	5·103905	127030	24·059	36
	Jaynagar s. (E)	24 37 37	4·976904	94821	17·958	7
	V	90 45 21	5·073888	118546	22·452	36
155	Deobárí h.s.	44 2 30	4·916024	82418	15·610	7
	Kharlí „ (E)	45 12 9	4·924940	84128	15·933	„
	V	61 7 6	4·957818	90744	17·186	36
156	VII	52 40 55	4·916024	82418	15·610	„
	Kharlí h.s. (E)		4·976904	94821	17·958	
	V	8 33 10	4·417752	26167	4·956	„
157	VII	24 3 26	4·855667	71724	13·584	„
	Rágogarh Hill Fort (D)		4·976904	94821	17·958	
	V	50 24 10	4·890789	77766	14·728	„
158	VIII	45 17 26	4·855667	71724	13·584	„
	Rágogarh Hill Fort (D)		5·001843	100425	19·020	
	VII	12 9 0	4·405918	25463	4·823	„
159	Jaynagar s.	150 8 20	4·779865	60237	11·409	7
	Guna Hill Temple		4·565909	36805	6·971	
	Kharlí h.s.	31 7 30	4·849843	70769	13·403	„
160	Deobárí „		4·820059	66078	12·515	
	Amála „	120 1 0	5·073888	118546	22·452	„
	Deobárí h.s.	90 44 30	4·932173	85541	16·201	„
161	Amála „	33 26 30	4·673430	47144	8·929	„
	Dongra Hill Temple		4·849843	70769	13·403	
	VII	41 41 38	4·815016	65315	12·370	36
162	VIII	59 52 31	4·929079	84934	16·086	„
	Megnáth Hill Mark		4·983182	96201	18·220	
	VIII	48 46 53	5·011432	102667	19·445	„
163	IX	55 27 23	5·050864	112425	21·293	„
	Patlápání Hill Mark		5·121549	132297	25·056	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	IX	50 26 13	5·037005	108894	20·624	7
164	XII	36 6 42	4·920375	83248	15·767	36
	Jálpa h.s. (D)		5·149205	140995	26·704	
	X	86 19 37	5·037005	108894	20·624	„
165	XII	43 42 41	4·877393	75404	14·281	„
	Jálpa h.s. (D)		4·921908	83543	15·822	
	IX		4·386477	24349	4·612	
166	Jálpa h.s.	93 27 57	4·945160	88137	16·693	7
	Amírpura „ (D)	70 31 38	4·920375	83248	15·767	„
	X	12 56 47	4·386477	24349	4·612	36
167	Jálpa h.s.	123 7 16	4·959146	91022	17·239	7
	Amírpura „ (D)		4·877393	75404	14·281	
	IX	39 2 11	4·747471	55908	10·589	„
168	Jálpa h.s.	30 39 4	4·655666	45255	8·571	„
	Pansara „ (D)	110 18 45	4·920375	83248	15·767	„
	Jálpa h.s.	62 48 53	4·696758	49746	9·422	„
169	Amírpura „	91 22 30	4·747471	55908	10·589	„
	Pansara „ (D)	25 48 37	4·386477	24349	4·612	„
	IX	53 29 27	4·826081	67001	12·690	„
170	Jálpa h.s.	33 33 3	4·663425	46071	8·726	„
	Dukúmpí „ (D)	92 57 30	4·920375	83248	15·767	„
	IX	14 27 16	4·061364	11518	2·181	„
171	Pansara h.s.	86 48 7	4·663425	46071	8·726	„
	Dukúmpí „ (D)	78 44 37	4·655666	45255	8·571	„
	IX	28 21 27	4·333436	21549	4·081	„
172	Pansara h.s.	65 43 23	4·616558	41358	7·833	„
	Tikí No. 2 „ (D)	85 55 10	4·655666	45255	8·571	„
	IX	13 54 11	4·063314	11569	2·191	„
173	Dukúmpí h.s.	59 11 50	4·616558	41358	7·833	„
	Tikí No. 2 „ (D)	106 53 59	4·663425	46071	8·726	„
	Jálpa h.s.	29 22 8	4·112270	12950	2·453	„
174	Amírpura „	37 52 5	4·209752	16209	3·070	„
	Rájgarh Palace		4·386477	24349	4·612	
	XII	66 9 39	5·164539	146063	27·663	36
175	XIII		5·101800	126415	23·942	
	Kalwa h.s.	61 29 58	5·147164	140334	26·578	12

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XII	44 9 16	5·002651	100612	19·055	36
176	Kalwa h.s.	74 46 18	5·144147	139363	26·394	12
	Agar Cantonment Flag		5·101800	126415	23·942	
	XIII	23 36 39	4·820495	66145	12·527	36
177	XV	98 15 19	5·213345	163435	30·954	,,
	Masrúrí Hill Temple (D)		5·146921	140256	26·564	
	XV	14 9 11	4·968148	92928	17·600	,,
178	XVIII	10 1 22	4·820495	66145	12·527	,,
	Masrúrí Hill Temple (D)		5·192141	155647	29·479	
	XIV		4·282635	19171	3·631	
179	XVI	22 24 0	4·816242	65500	12·405	,,
	Mata-Pír-kí-Dongrí h.s.	151 11 47	4·918112	82815	15·685	12
	XIV	52 21 20	4·859483	72357	13·704	36
180	XVI	12 38 17	4·300889	19993	3·787	,,
	Jhálrápátan Cant. Palace		4·918112	82815	15·685	
	XVI	33 22 36	4·550948	35559	6·735	,,
181	Mata-Pír-kí-Dongrí h.s.	129 22 43	4·698689	49968	9·464	12
	Jhálrápátan Temple No. 1		4·282635	19171	3·631	
	XVI	33 11 0	4·539376	34624	6·558	36
182	Mata-Pír-kí-Dongrí h.s.	129 10 35	4·690551	49040	9·288	12
	Jhálrápátan Temple No. 2		4·282635	19171	3·631	
	XVI	15 37 12	4·943631	87828	16·634	36
183	XVIII		4·239952	17376	3·291	
	Khanwára s.	161 19 35	5·018856	104437	19·780	7
	XVII	56 56 51	5·028811	106859	20·238	36
184	XX	36 3 29	4·875302	75042	14·212	,,
	Chendwása h.s.		5·104881	127315	24·113	
	XXIV	36 28 15	4·824212	66713	12·635	,,
185	XXV	101 57 41	5·040590	109797	20·795	,,
	Nímach Old Residency		4·871968	74468	14·104	
	XXVI	109 24 38	4·227021	16866	3·194	,,
186	Mendki s.	55 1 45	4·165955	14654	2·775	7
	Jáwad Temple		*3·680978	4797	0·909	
	XXIX	21 1 38	5·232253	170707	32·331	36
187	XXXI	139 52 32	5·486576	306602	58·069	,,
	Hánd Hill Temple		5·192163	155655	29·480	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XXIX	6 56 34	4·876448	75240	14·250	36
188	XXXI	7 32 20	4·912031	81664	15·467	,,
	Jasma h.s.	165 31 6	5·192163	155655	29·480	7
	XXIX	7 0 23	4·419240	26257	4·973	36
189	XXXI	39 18 23	5·134676	136356	25·825	,,
	Modia h.s. (D)		5·192163	155655	29·480	
	XXXI	46 50 43	4·781028	60399	11·439	,,
190	Jasma h.s.	18 29 23	4·419240	26257	4·973	7
	Modia ,, (D)		4·876448	75240	14·250	
	XXIX	7 5 6	4·435578	27263	5·164	36
191	XXXI	37 40 47	5·130685	135109	25·589	,,
	Arní Hill Temple		5·192163	155655	29·480	
	XXIX	57 27 4	5·189874	154837	29·325	,,
192	XXXI	64 37 13	5·220003	165960	31·432	,,
	Chítorgarh Hill Fort		5·192163	155655	29·480	
	XXIX	57 44 42	5·188859	154475	29·257	,,
193	XXXI	63 48 36	5·214607	163911	31·044	,,
	Chítorgarh Column		5·192163	155655	29·480	
	XXIX	31 50 55	4·891781	77944	14·762	,,
194	XXXIII	80 23 33	5·163278	145639	27·583	,,
	Dilwára Hill Temple (D)		5·135836	136721	25·894	
	XXXIII	32 5 46	4·689825	48958	9·272	,,
195	XXXIV	57 46 14	4·891781	77944	14·762	,,
	Dilwára Hill Temple (D)		4·964451	92141	17·451	
	XXX	94 3 18	5·202971	159577	30·223	,,
196	XXXII	22 34 49	4·788366	61428	11·634	,,
	Kanor Building		5·155338	143001	27·083	
	XXXI	119 22 31	4·542942	34909	6·612	,,
197	Modia h.s.	19 40 20	4·129876	13486	2·554	7
	Lakora Temple		4·419240	26257	4·973	
	XXXI	13 42 47	3·862142	7280	1·379	36
198	Modia h.s.	45 2 40	4·337106	21732	4·116	7
	Poní Hill Temple		4·419240	26257	4·973	
	XXXI	14 3 15	4·149647	14114	2·673	36
199	Modia h.s.	12 48 10	4·109890	12879	2·439	7
	Alolí Temple		4·419240	26257	4·973	

* Deduced base.

No.	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
200	XXXII	4 54 40	4·264917	18404	3·486	36
	XXXIV	142 4 20	5·121032	132139	25·026	,,
	Koman h.s.		5·068695	117137	22·185	
201	XXXII	50 9 4	4·884789	76699	14·526	,,
	XXXV	36 4 46	4·769623	58833	11·143	,,
	Udaipúr Temple		4·998636	99686	18·880	
202	XXXII	107 35 33	5·023148	105475	19·976	,,
	XXXV	8 7 42	4·194371	15645	2·963	,,
	Lakarwás Hill Temple		4·998636	99686	18·880	
203	XXXIII	52 46 21	4·936628	86423	16·368	,,
	XXXIV		4·002907	10067	1·907	
	Govardhan h.s.	121 54 20	4·964451	92141	17·451	7
204	XXXIII	56 30 48	3·924567	8406	1·592	36
	Govardhan h.s.	30 46 25	3·712365	5157	0·977	7
	Natiwás White Building		4·002907	10067	1·907	
205	XXXIII	26 1 48	3·650758	4475	0·847	36
	Govardhan h.s.	73 6 17	3·989288	9756	1·848	7
	Náthdwára Fort Bastion		4·002907	10067	1·907	
206	XXXIII	17 29 19	3·480822	3026	0·573	36
	Govardhan h.s.	73 21 20	3·984365	9646	1·827	7
	Náthdwára Temple		4·002907	10067	1·907	
207	XXXIII	48 46 36	4·277716	18955	3·590	36
	Govardhan h.s.	107 40 40	4·380406	24011	4·547	7
	Manja Temple		4·002907	10067	1·907	
208	XXXIII	70 53 10	4·347153	22241	4·212	36
	Govardhan h.s.	83 47 35	4·369228	23401	4·432	7
	Bada Aro Temple		4·002907	10067	1·907	
209	XXXIII	88 55 40	4·710536	51349	9·725	36
	Govardhan h.s.	79 46 5	4·703650	50542	9·572	7
	Kakraulí Palace		4·002907	10067	1·907	
210	XXXIV	50 30 5	5·017742	104170	19·729	36
	XXXV	21 24 47	4·692726	49286	9·335	,,
	Dholia Hill Mark		5·108322	128328	24·305	
211	XXXIV	36 31 12	4·385388	24288	4·600	,,
	Koman h.s.	116 40 33	4·561920	36469	6·907	7
	Goginda ,, (E)	26 48 15	4·264917	18404	3·486	,,
212	XXXIV	7 23 53	4·144143	13936	2·639	36
	Dholia Hill Mark		4·561920	36469	6·907	
	Goginda h.s. (E)	152 54 39	4·692726	49286	9·335	7
213	XXXIV	24 10 11	4·047238	11149	2·112	36
	Koman h.s.	18 21 10	3·933174	8574	1·624	7
	Batála Temple		4·264917	18404	3·486	
214	Koman h.s.	7 4 27	3·811726	6482	1·228	,,
	Goginda ,,	20 24 20	4·263683	18352	3·476	,,
	Goginda Temple		4·385388	24288	4·600	
215	Koman h.s.	13 7 25	3·812772	6498	1·231	,,
	Goginda ,,	44 56 40	4·305709	20217	3·829	,,
	Majaurí Temple		4·385388	24288	4·600	
216	XXXVIII	23 34 41	4·855576	71709	13·581	36
	XLI	35 0 15	5·012155	102838	19·477	,,
	Erinpura Cantonment		5·184665	152991	28·976	
217	XXXIX	44 52 33	5·067376	116782	22·118	,,
	XL	22 32 35	4·802461	63454	12·018	,,
	Pesua Hill Temple		5·184195	152825	28·944	
218	XXXIX	83 41 25	5·195849	156982	29·731	,,
	XL	20 55 45	4·751416	56418	10·685	,,
	Birwára Hill Temple		5·184195	152825	28·944	
219	XL	5 29 53	4·110751	12905	2·444	,,
	XLII	47 27 42	4·996696	99242	18·796	,,
	Achalgarh Temple (D)		5·031449	107510	20·362	
220	XLII	33 26 42	5·058860	114514	21·688	,,
	XLIII	3 33 39	4·110751	12905	2·444	,,
	Achalgarh Temple (D)		5·097123	125061	23·686	
221	XLI	11 23 44	4·959565	91110	17·256	,,
	XLII	8 2 45	4·809839	64542	12·224	,,
	Sirohí Dome		5·186058	153482	29·069	
222	XLI		4·447706	28035	5·310	
	XLII		5·242026	174593	33·067	
	Arbada Deví h.s. (D)	38 1 21	5·186058	153482	29·069	14
223	XLI		5·058841	114509	21·687	
	XLIV		5·242026	174593	33·067	
	Arbada Deví h.s. (D)	73 29 26	5·254146	179534	34·003	,,

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XLII	8 59 59	3·674114	4722	0·894	14
224	Arbada Devi h.s.	102 45 20	4·468942	29440	5·576	7
	Abú House		4·447706	28035	5·310	
	XLIII	34 36 29	4·823938	66671	12·627	36
225	XLVI	91 41 6	5·069433	117336	22·223	,,
	Dísa Cantonment		4·975956	94614	17·919	
	XLIV	80 16 55	4·834935	68381	12·951	,,
226	XLV	4 16 23	3·713425	5169	0·979	,,
	Nímaj Temple		4·839248	69063	13·080	
	LX	65 55 32	4·636100	43261	8·193	,,
227	LXII	37 38 21	4·461440	28936	5·480	,,
	Láljí Hill Mark (D)		4·663335	46061	8·724	
	LXII	84 43 59	4·851114	70976	13·442	,,
228	LXV	37 22 8	4·636100	43261	8·193	,,
	Láljí Hill Mark (D)		4·780888	60379	11·435	
	LXI	64 33 38	5·005857	101358	19·197	,,
229	LXIV	79 45 23	5·043172	110451	20·919	,,
	Voláva Hill Mark		4·816043	65470	12·400	
	LXIV	58 39 2	4·664116	46144	8·739	,,
230	LXVI	53 51 13	4·639802	43632	8·264	,,
	Súrtonk Hill Mark		4·698255	49918	9·454	
	LXVI	65 27 48	4·873191	74678	14·144	,,
231	LXVIII [Mark	74 49 49	4·898892	79230	15·006	,,
	Karínáth-ka-bhit Hill		4·719696	52444	9·933	
	LXVII	57 58 34	4·958380	90862	17·209	,,
232	LXIX	70 19 18	5·003939	100911	19·112	7
	Kála Thúra Hill Mark		4·924832	84107	15·929	
	LXVIII	37 55 55	4·692997	49317	9·340	36
233	LXX	69 1 49	4·874556	74913	14·188	7
	Pelú Hill Mark		4·885000	76736	14·533	
	LXIX	48 38 34	4·692378	49247	9·327	,,
234	LXXI	82 35 40	4·813329	65062	12·322	36
	Kusalkot Hill Mark		4·693177	49337	9·344	
	LXIX	75 23 9	4·756735	57113	10·817	,,
235	LXXI	47 54 13	4·641433	43796	8·295	,,
	Sama Hill Mark		4·693177	49337	9·344	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	LXX	79 56 57	4·853977	71446	13·531	36
236	LXXII	24 39 21	4·481003	30269	5·733	,,
	Tattal Hill Mark		4·846428	70215	13·298	
	LXX	39 44 8	4·652235	44899	8·504	,,
237	LXXII	51 42 55	4·741405	55132	10·442	,,
	Bhisiwádí Hill Mark		4·846428	70215	13·298	
	LXX	35 25 53	4·690342	49016	9·283	,,
238	LXXII	88 25 27	4·926953	84519	16·007	,,
	Támpí Hill Mark		4·846428	70215	13·298	
	LXXI	39 14 10	4·734362	54245	10·274	,,
239	LXXIII	49 10 48	4·812252	64901	12·292	,,
	Tonk Hill Mark		4·933124	85728	16·236	
	LXXII	34 22 31	4·669935	46767	8·857	,,
240	LXXIV	31 35 52	4·637478	43399	8·219	7
	Singara Hill Mark		4·878825	75653	14·328	
	LXXII	48 50 59	4·808470	64338	12·185	36
241	LXXIV	68 50 56	4·901393	79688	15·092	,,
	Sehar Hill Mark (D)		4·878825	75653	14·328	
	LXXIV	83 10 1	4·873840	74789	14·165	,,
242	LXXVII	58 39 58	4·808470	64338	12·185	,,
	Sehar Hill Mark (D)		4·667893	46547	8·816	
	LXXIII	65 43 21	4·747140	55865	10·581	,,
243	LXXV	45 2 24	4·637141	43365	8·213	,,
	Narchar Hill Mark		4·758191	57305	10·853	
	LXXIII	72 48 46	4·862089	72793	13·787	,,
244	LXXV	58 25 0	4·812307	64909	12·293	,,
	Darár Hill Mark		4·758191	57305	10·853	
	LXXIV	50 27 48	4·561715	36451	6·904	,,
245	LXXVII	49 32 4	4·555807	35959	6·810	,,
	Islámkot Hill Mark		4·667893	46547	8·816	
	LXXV	56 47 24	4·743379	55383	10·489	,,
246	LXXVI	45 33 8	4·674456	47256	8·950	,,
	Dholkí Hill Mark		4·810670	64665	12·247	
	LXXV	55 34 30	4·907670	80848	15·312	,,
247	LXXVIII	55 28 0	4·907106	80743	15·292	,,
	Milkam Hill Mark		4·961316	91478	17·325	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	LXXV	69 29 41	4·937361	86569	16·396	36
248	LXXVIII	28 42 49	4·647420	44404	8·410	,,
	Dilbhar Hill Mark		4·961316	91478	17·325	
	LXXVII	62 33 54	4·954254	90001	17·046	7
249	LXXIX	52 23 52	4·904931	80340	15·216	36
	Chumpání Hill Mark		4·963468	91932	17·411	
	LXXIX	47 55 57	4·866725	73574	13·934	,,
250	LXXXII	55 11 21	4·910477	81372	15·412	,,
	Sagror Hill Mark		4·984622	96521	18·281	
	LXXIX	9 54 12	4·239118	17343	3·285	7
251	LXXXII	63 16 16	4·954546	90063	17·057	36
	Pelora Hill Mark		4·984622	96521	18·281	
	LXXXII	54 4 30	4·804424	63742	12·072	7
252	LXXXV	68 46 4	4·865525	73371	13·896	,,
	Arní h.s. (E)	57 9 26	4·820416	66133	12·525	,,
	LXXXV	51 19 2	4·714724	51847	9·820	,,
253	LXXXVIII	73 40 48	4·804424	63742	12·072	36
	Arní h.s. (E)	55 0 10	4·735664	54408	10·305	7
	LXXXII	51 55 1	4·815912	65450	12·396	,,
254	Arní h.s.	66 9 10	4·881116	76053	14·404	,,
	Pábú Hill Mark		4·865525	73371	13·896	
	LXXXVIII	13 55 40	4·479261	30148	5·710	36
255	Arní h.s.	141 37 11	4·890794	77767	14·729	7
	Ladda ,, (E)	24 27 9	4·714724	51847	9·820	,,
	Pábú Hill Mark		4·479261	30148	5·710	
256	Arní h.s.	40 4 3	4·668482	46610	8·828	,,
	Ladda ,, (E)	115 19 42	4·815912	65450	12·396	,,
	Arní h.s.	45 51 19	4·374740	23700	4·489	,,
257	Ladda ,,	68 14 40	4·486777	30674	5·810	,,
	Soapdár Laggarí Mosque		4·479260	30148	5·710	
	Arní h.s.	53 27 10	4·401292	25194	4·772	,,
258	Ladda ,,	52 31 44	4·396013	24889	4·714	,,
	Wanga Bázár		4·479260	30148	5·710	
	Arní h.s.	83 38 43	4·610650	40799	7·727	,,
259	Ladda ,,	49 5 53	4·491752	31028	5·876	,,
	Mír Abdul Mosque		4·479260	30148	5·710	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	XCV	51 26 55	4·639698	43621	8·262	36
260	XCVII	46 27 54	4·606774	40437	7·658	,,
	Jhún Dome		4·742308	55247	10·463	
	XCVI	48 51 52	4·666466	46394	8·787	,,
261	XCVII	23 4 10	4·382698	24138	4·572	,,
	Amír's Tomb No. 3		4·767625	58563	11·092	
	XCVI	42 8 33	4·631458	42801	8·106	,,
262	XCVII	24 30 9	4·422519	26456	5·011	,,
	Amír's Tomb No. 1 (D)		4·767625	58563	11·092	
	XCVII	29 25 8	4·386136	24330	4·608	,,
263	XCIX	59 46 55	4·631458	42801	8·106	,,
	Amír's Tomb No. 1 (D)		4·694844	49527	9·380	
	XCVI	42 35 8	4·633194	42973	8·139	,,
264	XCVII	24 39 46	4·423229	26499	5·019	,,
	Amír's Tomb No. 2 (D)		4·767625	58563	11·092	
	XCVII	29 15 31	4·383953	24208	4·585	,,
265	XCIX	60 11 0	4·633194	42973	8·139	,,
	Amír's Tomb No. 2 (D)		4·694844	49527	9·380	
	XCVI	38 57 8	4·528861	33796	6·401	,,
266	XCIX	28 32 33	4·409693	25686	4·865	,,
	Mor-ka-got Dome		4·696036	49663	9·406	
	XCVII	13 20 54	4·123524	13290	2·517	,,
267	XCIX	107 17 34	4·740067	54963	10·410	,,
	Bela-ka-Masjid		4·694844	49527	9·380	
	XCVII	13 24 57	4·347105	22238	4·212	,,
268	C	34 57 20	4·739695	54916	10·401	,,
	Hasan Alí's Dome		4·855177	71644	13·569	
	XCVIII	9 3 54	4·557424	36093	6·836	,,
269	C	6 43 20	4·428386	26816	5·079	,,
	Molásan Dome No. 3		4·794666	62326	11·804	
	XCIX	98 47 42	4·943443	87790	16·627	,,
270	CI	27 45 44	4·616782	41379	7·837	,,
	Muhammad Khán's Tánda		4·853437	71357	13·515	
	C	54 23 55	4·679566	47815	9·056	,,
271	CI	30 0 30	4·468509	29411	5·570	,,
	Jhok s. (D)	95 35 35	4·767357	58527	11·085	7

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
272	CI	85 59 37	4·911288	81525	15·440	36
	CIII	35 48 31	4·679566	47815	9·056	,,
	Jhok s. (D)	58 11 52	4·841705	69455	13·154	7
273	C	53 26 48	4·673864	47192	8·938	36
	CI	31 35 42	4·488243	30778	5·829	,,
	Jhok Temple (D)		4·767357	58527	11·085	
274	CI	84 24 25	4·903502	80076	15·166	,,
	CIII	35 54 40	4·673864	47192	8·938	,,
	Jhok Temple (D)		4·841705	69455	13·154	
275	CI	14 4 42	4·753808	56729	10·744	,,
	CIII	3 14 53	4·121027	13214	2·503	,,
	Dádu Masjid		4·841705	69455	13·154	
276	CI	28 12 34	4·517428	32918	6·234	,,
	CIII	57 38 16	4·769539	58822	11·141	,,
	Jharrak House		4·841705	69455	13·154	
277	CII	4 30 53	3·979546	9540	1·807	,,
	CIII	26 5 5	4·726644	53290	10·093	,,
	Súnda Dome		4·790233	61693	11·684	
278	CII	63 39 51	4·784775	60922	11·538	,,
	CIII	51 10 4	4·723895	52954	10·029	,,
	Lagárí Hill Mark (D)		4·790233	61693	11·684	
279	CII	61 6 33	4·727398	53382	10·110	,,
	CIV	60 17 9	4·723895	52954	10·029	,,
	Lagárí Hill Mark (D)		4·716374	52044	9·857	
280	CII	29 4 8	4·483078	30414	5·760	,,
	CIII	51 10 13	4·688111	48765	9·236	,,
	Amír Pír Dome (D)		4·790233	61693	11·684	
281	CII	33 29 56	4·629824	42641	8·076	,,
	CV	39 8 18	4·688111	48765	9·236	,,
	Amír Pír Dome (D)		4·867693	73738	13·966	
282	CII	19 31 55	4·409412	25669	4·862	,,
	CIV	23 8 41	4·479687	30178	5·715	,,
	Dholmárí h.s. (D)	137 19 24	4·716374	52044	9·857	7
283	CIII	13 31 41	4·409412	25669	4·862	36
	CIV	53 17 56	4·944389	87981	16·663	,,
	Dholmárí h.s. (D)		5·003809	100881	19·106	
284	CII	63 26 41	4·670319	46808	8·865	36
	CIV	20 35 2	4·264758	18397	3·484	,,
	Shaikh Radan h.s. (D)		4·716374	52044	9·857	
285	CII	43 54 46	4·326241	21195	4·014	,,
	Dholmárí h.s.	37 0 50	4·264758	18397	3·484	7
	Shaikh Radan ,, (D)	99 4 24	4·479687	30178	5·715	,,
286	CII	45 6 44	4·632557	42910	8·127	36
	CIV	75 38 54	4·768453	58675	11·113	,,
	Saiyid Alí Pír Dome (E)		4·716374	52044	9·857	
287	CIV	85 28 59	5·017937	104217	19·738	,,
	CVII	24 14 1	4·632557	42910	8·127	,,
	Saiyid Alí Pír Dome (E)		4·993050	98412	18·639	
288	Dholmárí h.s.	87 3 23	4·693711	49398	9·356	7
	Shaikh Radan ,,	67 34 15	4·660121	45722	8·659	,,
	Tatta Sarái		4·326241	21195	4·014	
289	Dholmárí h.s.	89 58 45	4·678972	47750	9·044	,,
	Shaikh Radan ,,	63 40 8	4·631399	42796	8·105	,,
	Maklí Tomb		4·326241	21195	4·014	
290	CIII	64 33 7	4·925315	84201	15·947	36
	CV	65 47 15	4·929649	85045	16·107	,,
	Sháhtera Hill Mark		4·851721	71076	13·461	
291	CIV	45 24 53	4·821989	66373	12·571	,,
	CVI	35 37 0	4·734575	54272	10·279	,,
	Jangsháí Hill (D)		4·964041	92054	17·434	
292	CVI	38 46 2	4·647819	44445	8·418	,,
	CVII	69 14 34	4·821989	66373	12·571	,,
	Jangsháí Hill (D)		4·829317	67502	12·784	
293	CIV	58 34 47	4·940653	87227	16·520	,,
	CVII	47 5 57	4·874345	74876	14·181	,,
	Conical Hill Tomb		4·993050	98412	18·639	
294	CIV	56 0 23	4·911657	81594	15·453	,,
	CVII	33 55 33	4·739777	54926	10·403	,,
	Dome No. 1		4·993050	98412	18·639	
295	CVI	35 13 19	4·747035	55852	10·578	,,
	CVII	100 35 13	4·978595	95191	18·029	,,
	Dome No. 2		4·829317	67502	12·784	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
296	CIX	44 0 21	4·604361	40213	7·616	36
	(XXV)	45 28 43	4·615627	41269	7·816	,,
	Halálú Tomb		4·762526	57880	10·962	
	SIHOR *SECONDARY SERIES.*					
297	III	80 28 22	5·000312	100072	18·953	15
	VI	55 28 19	4·922191	83597	15·833	,,
	Bhora h.s.	44 3 19	4·848548	70558	13·363	,,
298	VI	37 54 57	4·858172	72139	13·663	,,
	Bhora h.s.	83 36 22	5·066938	116664	22·096	,,
	Ulia ,,	58 28 41	5·000312	100072	18·953	,,
299	Bhora h.s.	57 40 6	4·838715	68979	13·064	,,
	Ulia ,,	60 14 30	4·850458	70869	13·422	,,
	Ketwás ,,	62 5 24	4·858172	72139	13·663	,,
300	Ulia h.s.	54 23 5	4·773240	59325	11·236	,,
	Ketwás ,,	54 39 59	4·774761	59533	11·275	,,
	Singpúr ,,	70 56 56	4·838715	68979	13·064	,,
301	Ketwás h.s.	74 19 16	4·932833	85671	16·226	,,
	Singpúr ,,	63 51 54	4·902460	79884	15·130	,,
	Ratwa ,,	41 48 50	4·773240	59325	11·236	,,
302	Ratwa h.s.	62 26 13	4·897039	78893	14·942	,,
	Singpúr ,,	43 16 10	4·785322	60999	11·553	,,
	Bagonia ,,	74 17 37	4·932833	85671	16·226	,,
303	Singpúr h.s.	60 11 29	4·894307	78398	14·848	,,
	Bagonia ,,	58 58 48	4·888917	77431	14·665	,,
	Pánbiár ,,	60 49 43	4·897039	78893	14·942	,,
304	Bagonia h.s.	56 47 3	4·850744	70916	13·431	,,
	Pánbiár ,,	55 33 53	4·844550	69912	13·241	,,
	Jamúnia ,,	67 39 4	4·894307	78398	14·848	,,
305	Pánbiár h.s.	16 2 43	4·292289	19601	3·712	,,
	Jamúnia ,,	73 31 49	4·832561	68008	12·880	,,
	Búdi s.	90 25 28	4·850744	70916	13·431	,,

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	VI	3 50 38	4·342363	21997	4·166	15
306	Bhora h.s.	13 54 47	4·897064	78898	14·943	,,
	Sagrámpúr Hill		5·000312	100072	18·953	
307	Bhora h.s.	40 3 11	4·669067	46673	8·840	,,
	Ketwás ,,	37 39 38	4·646550	44315	8·393	,,
	Somgarh Fort		4·850458	70869	13·422	
308	Bhora h.s.	14 32 3	4·428366	26814	5·078	,,
	Ketwás ,,	123 54 57	4·947770	88669	16·793	,,
	Karaia Hill Fort (D)		4·850458	70869	13·422	
309	Ketwás h.s.	67 9 42	4·867707	73741	13·966	,,
	Ratwa ,,	19 34 48	4·428366	26814	5·078	,,
	Karaia Hill Fort (D)		4·902460	79884	15·130	
310	Ulia h.s.	27 15 7	4·499896	31615	5·988	,,
	Ketwás ,,	60 16 8	4·777822	59955	11·355	,,
	Gúpa Hill Mark (D)		4·838715	68979	13·064	
311	Ketwás h.s.	68 43 7	4·872056	74483	14·107	,,
	Ratwa ,,	23 17 54	4·499896	31615	5·988	,,
	Gúpa Hill Mark (D)		4·902460	79884	15·130	
312	Ulia h.s.	68 39 44	4·744157	55483	10·508	,,
	Singpúr ,,	19 27 7	4·297462	19836	3·757	,,
	Kantora Hill Mark		4·774761	59533	11·275	
313	Ketwás h.s.	74 55 37	4·926730	84475	15·999	,,
	Singpúr ,,	62 22 35	4·889375	77513	14·681	,,
	Párdí Peak (E)		4·773240	59325	11·236	
314	Singpúr h.s.	44 45 29	4·795278	62413	11·821	,,
	Bagonia ,,	72 21 54	4·926730	84475	15·999	,,
	Párdí Peak (E)		4·897039	78893	14·942	
315	Ketwás h.s.	9 34 1	4·459365	28798	5·454	,,
	Ratwa ,,	17 53 11	4·726058	53218	10·079	,,
	Sagoní Barkhera Hill		4·902460	79884	15·130	
316	Ketwás h.s.	11 39 21	4·453542	28415	5·382	,,
	Ratwa ,, [(D)	133 44 3	5·006992	101623	19·247	,,
	Bagrázmátha Hill Tree		4·902460	79884	15·130	
317	Ratwa h.s.	29 29 0	4·589583	38867	7·361	,,
	Bagonia ,, [(D)	21 5 19	4·453542	28415	5·382	,,
	Bagrázmátha Hill Tree		4·785322	60999	11·553	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Singpúr h.s.	9 10 58	4·463202	29054	5·503	15
318	Ratwa ,,	18 53 18	4·770387	58937	11·162	,,
	Píparkhera Hill Tree		4·932833	85671	16·226	
	Singpúr h.s.	41 9 31	4·711063	51412	9·737	,,
319	Pánbiár ,,	41 14 55	4·711843	51504	9·755	,,
	Talái Tonk Hill (E)		4·888917	77431	14·665	
	Bagonia h.s.	29 54 9	4·711063	51412	9·737	,,
320	Pánbiár ,,	19 34 48	4·538579	34560	6·546	,,
	Talái Tonk Hill (E)		4·894307	78398	14·848	
	Ratwa h.s.	36 38 15	4·693299	49351	9·347	,,
321	Bagonia ,,	95 50 9	4·915250	82272	15·582	,,
	Beta Hill		4·785322	60999	11·553	
	Ratwa h.s.	41 8 13	4·685587	48483	9·182	,,
322	Bagonia ,,	83 0 2	4·864204	73148	13·854	,,
	Manwábhán Peak (D)		4·785322	60999	11·553	
	Bagonia h.s.	86 56 30	4·918685	82925	15·705	,,
323	Jamúnia ,,	35 43 12	4·685587	48483	9·182	,,
	Manwábhán Peak (D)		4·844550	69912	13·241	
	Bagonia h.s.	54 59 17	4·844206	69856	13·230	,,
324	Pánbiár ,,	11 49 9	4·242284	17470	3·309	,,
	Jernia Hill Tree (D)		4·894307	78398	14·848	
	Pánbiár h.s.	43 44 44	4·719775	52454	9·934	,,
325	Jamúnia ,,	67 3 11	4·844206	69856	13·230	,,
	Jernia Hill Tree (D)		4·850744	70916	13·431	
	Bagonia h.s.	68 18 3	5·056181	113810	21·555	,,
326	Pánbiár ,,	71 54 16	5·066071	116432	22·051	,,
	Kálápahár Hill (E)		4·894307	78398	14·848	
	Pánbiár h.s.	16 20 23	4·698262	49919	9·454	,,
327	Jamúnia ,,	140 6 10	5·056181	113810	21·555	,,
	Kálápahár Hill (E)		4·850744	70916	13·431	
	Jamúnia h.s.	51 8 41	4·284987	19275	3·651	,,
328	Búdi s.	76 29 18	4·381408	24066	4·558	,,
	Síhor Residency		4·292289	19601	3·712	
	Jamúnia h.s.	49 40 22	4·266870	18487	3·501	,,
329	Búdi s.	76 23 45	4·372351	23570	4·464	,,
	Síhor, Mahádeo's Temple		4·292289	19601	3·712	
	Jamúnia h.s.	35 2 9	4·162582	14541	2·754	,,
330	Búdi s.	94 15 31	4·402403	25258	4·784	,,
	Síhor, Ganesha's Temple		4·292289	19601	3·712	
	Jamúnia h.s.	50 31 8	4·233538	17121	3·243	,,
331	Búdi s.	11 33 56	3·648105	4447	0·842	,,
	Ráipúr Chaukí		4·292289	19601	3·712	

UMARKOT

SECONDARY SERIES.

	LXXVIII	71 8 44	4·678703	47720	9·038	36
332	LXXX	32 38 6	4·434474	27194	5·150	,,
	Gungia h.s.		4·689970	48975	9·275	
	LXXX	52 8 48	4·764615	58159	11·015	,,
333	Gungia h.s.	87 28 20	4·866793	73586	13·937	7
	Pátátonk ,,	40 22 52	4·678703	47720	9·038	,,
	Gungia h.s.		4·754097	56767	10·751	
334	Pátátonk ,,	68 29 48	4·810826	64688	12·252	,,
	Náríthal ,,	56 46 14	4·764615	58159	11·015	,,
	Náríthal h.s.	66 20 14	4·728077	53466	10·126	,,
335	Pátátonk ,,	37 8 12	4·547052	35241	6·674	,,
	Karúra ,,	76 31 34	4·754097	56767	10·751	,,
	Karúra h.s.	51 25 59	4·632924	42946	8·134	,,
336	Pátátonk ,,	25 19 24	4·370949	23494	4·450	,,
	Súbrí ,,	103 14 37	4·728077	53466	10·126	,,
	Pátátonk h.s.	126 51 32	4·780089	60268	11·414	,,
337	Súbrí ,,	18 22 50	4·375697	23752	4·498	,,
	LXXXIII	34 45 38	4·632924	42946	8·134	36
	Súbrí h.s.		4·916595	82527	15·630	
338	LXXXIII	87 50 58	5·001507	100348	19·005	,,
	LXXXIV	36 52 56	4·780089	60268	11·414	7
	Gungia h.s.	51 47 6	4·801723	63346	11·997	,,
339	Náríthal ,,	74 51 40	4·891129	77827	14·740	,,
	Rámsar Hill Mark		4·810826	64688	12·252	

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Karúra h.s.	87 27 37	4·525238	33515	6·348	7
340	Súbrí ,,	48 5 19	4·397342	24966	4·728	,,
	Umarkot s.	44 27 4	4·370949	23494	4·450	,,
	HAIDARABAD AND KOTRI *SECONDARY SERIES.*					
	XCIX	76 45 43	4·955408	90242	17·091	14
341	CI	52 54 34	4·868936	73950	14·006	,,
	Rakhrái h.s.	50 19 43	4·853437	71357	13·515	,,
	CI	42 4 15	4·828825	67426	12·770	,,
342	Rakhrái h.s.	74 11·24	4·985970	96821	18·337	,,
	Aungarh ,,	63 44 21	4·955408	90242	17·091	,,

No. of triangle	Station	Corrected plane angle	Distance			Theodolite used
			Log. feet	Feet	Miles	
		° ′ ″				Inch
	Rakhrái h.s.	80 58 13	4·977086	94861	17·966	14
343	Aungarh ,,	54 26 38	4·892884	78142	14·800	,,
	Haidarábád s.	44 35 9	4·828825	67426	12·770	,,
	CI		4·614275	41141	7·792	
344	Aungarh h.s.	16 55 10	4·768602	58695	11·117	,,
	Jharrak ,, (D)	151 18 37	4·985970	96821	18·337	,,
	Rakhrái h.s.		4·614275	41141	7·792	
345	Aungarh ,,	80 39 31	4·863700	73063	13·838	,,
	Jharrak ,, (D)	65 35 17	4·828825	67426	12·770	,,
	Aungarh h.s.	7 55 49	4·295388	19742	3·739	,,
346	Haidarábád s.		4·898579	79173	14·995	
	Kotrí ,,	138 28 31	4·977086	94861	17·966	,,

NOTE.—1. Stations denoted by Roman Numerals are Principal Stations, excepting where 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.

April 1874.

J. B. N. HENNESSEY.

KARACHI LONGITUDINAL 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
AKORIA, LXI			
Voláva Hill Mark		29 58 45	229
ALAMKHAN, XCV			
Jhún Dome		162 58 5	260
ALAM-SHAHAR, LXVIII			
Karínáth-ka-bhit Hill Mark		13 41 3	231
Pelú Hill Mark		42 29 25	233
AMALA h.s.			
Kharlí	h.s.	191 4 15	160
Dongra Hill Temple		277 38 45	161
Deobárí	„	311 5 15	160
AMIRPURA h.s.			
Dáwa, X		31 55 34	167
Rájgarh Palace		37 59 26	174
Jálpa	h.s.	75 51 31	166
AMIRPURA h.s.			
Mátá-ká-húrá, IX		146 23 9	166
Pansara	h.s.	167 14 1	169
ARBADA DEVI h.s.			
Súnda, XLIV		123 48 56	223
Bonik, XLI		197 18 22	222
Gúrú Sikkar, XLII		235 19 43	222
Abú House		338 5 3	224
ARNI h.s.			
Soapdár Laggarí Mosque		41 28 12	257
Wanga Bázár		49 4 3	258
Mír Abdul Mosque		79 15 36	259
Pangra, LXXXVIII		137 14 4	253
Mairáb-ká-Shahar, LXXXV		192 14 14	252
Pádria, LXXXII		249 23 40	252
Pábú Hill Mark		315 32 50	254
Ladda	h.s.	355 36 53	255
ARNIÁLA, LXXIV			
Islámkot Hill Mark		3 13 59	245
Singara	„	293 16 42	240
Sehar	„	330 31 46	241
AUNGARH h.s.			
Kotrí	s.	203 7 42	346
Haidarábád	„	211 3 31	343
Rakhrái	h.s.	265 30 9	342
Kanád, CI		329 14 30	342
Jharrak	„	346 9 40	344
BAGONIA h.s.			
Kálápahár Hill		35 19 19	326
Jamúnia	h.s.	46 50 19	304
Jernia Hill Tree		48 38 5	324
Pánbiár	„	103 37 22	303
Talái Tonk Hill		133 31 31	320
Singpúr	„	162 36 10	302

Name of station with azimuths of surrounding points	° ′ ″	Reference to triangle containing distance
Bagonia h.s.		
Párdí Peak	234 58 3	314
Ratwa h.s.	236 53 47	302
Bagrázmátha Hill Tree	257 59 5	317
Manwábhán Peak	319 53 48	322
Beta Hill	332 43 55	321
Balagarra, XXIV		
Nímach Old Residency	162 18 49	185
Banskati, XIV		
Mata-Pír-kí-Dongrí h.s.	40 49 1	179
Jhálrápátan Cant. Palace	99 34 34	180
Bargaon, XLV		
Nímaj Temple	240 19 25	226
Belka, XXXIX		
Pesua Hill Temple	70 30 56	217
Birwára „	109 19 48	218
Bharak, XXXI		
Jasma h.s.	17 37 54	188
Hánd Hill Temple	149 58 6	187
Lakora Temple	211 24 40	197
Chítorgarh Hill Fort	305 28 21	192
Chítorgarh Column	306 16 38	193
Alolí Temple	316 43 56	199
Poní Hill Temple	317 4 24	198
Modia „	330 47 11	189
Arní Hill Temple	332 24 47	191
Bhilgaon, LXIV		
Súrtonk Hill Mark	81 1 13	230
Voláva „	354 12 51	229
Bhora h.s.		
Karaia Hill Fort	6 46 41	308
Ulia h.s.	49 54 44	298
Dand, VI	133 31 6	297
Sagrámpúr Hill	147 25 54	306
Tinsiá, III	177 34 25	297
Somgarh Fort	312 11 27	307
Ketwás „	352 14 38	299
Birona, XLVI		
Disa Cantonment	7 40 52	225
Bolalio, (XXV)		
Halálú Tomb	195 47 39	296
Bonik, XLI		
Arbada Deví h.s.	17 22 18	222
Erinpura Cantonment	247 11 39	216
Sirohí Dome	359 30 57	221
Borikalor, XXX		
Kanor Building	211 42 2	196
Budi s.		
Pánbiár h.s.	175 8 57	305
Ráipúr Chauki	254 0 28	331
Jamúnia „	265 34 25	305
Síhor, Mahádeo's Temple	341 58 9	329

Name of station with azimuths of surrounding points	° ′ ″	Reference to triangle containing distance
Budi s.		
Síhor Residency	342 3 42	328
Síhor, Ganesha's Temple	359 49 55	330
Changa, LXXX		
Pátátonk h.s.	153 33 17	333
Gunjia „	205 22 5	332
Chendwasa h.s.		
Rámpúrá, XX	169 40 1	184
Khajúri, XVII	256 39 41	184
Chutli, C		
Jhok s.	119 2 21	271
Jhok Temple	119 59 28	273
Hasan Alí's Dome	201 28 40	268
Molásan Dome No. 3	282 28 49	269
Daduri, CIII		
Dholmárí h.s.	55 34 38	283
Súnda Dome	70 7 2	277
Lagárí Hill Mark	95 12 1	278
Amír Pír Dome	95 12 10	280
Sháhtera Hill Mark	175 37 43	290
Jharrak House	231 42 35	276
Dádu Masjid	286 5 58	275
Jhok s.	325 9 22	272
Jhok Temple	325 15 31	274
Dand, VI		
Naya Kila Mark	271 36 54	148
Sagrámpúr Hill	309 35 9	306
Bhora h.s.	313 25 47	297
Ulia „	351 20 44	298
Dawa, X		
Jálpa h.s.	198 55 16	165
Amírpura „	211 52 3	167
Deobari h.s.		
Amála h.s.	131 9 14	160
Kharlí „	160 0 44	155
Salot, V	204 3 14	147
Dongra Hill Temple	221 53 44	161
Tinsiá, III	244 10 7	147
Dharindera, LXXIII		
Narchar Hill Mark	139 49 20	243
Darár „	146 54 45	244
Tonk „	227 27 30	239
Dholmari h.s.		
Tatta Sarái	23 42 19	288
Maklí Tomb	26 37 41	289
Károthol, CIV	122 18 42	282
Dadúri, CIII	235 29 5	283
Hilaia, CII	259 38 6	282
Shaikh Radan h.s.	296 38 56	285
Didawa, LXII		
Láljí Hill Mark	222 16 14	227
Drabi, LXXVII		
Chumpání Hill Mark	39 27 10	249

Name of station with azimuths of surrounding points	° ′ ″	Reference to triangle containing distance
Drabi, LXXVII		
Islámkot Hill Mark	283 11 0	245
Sehar „	292 18 54	242
Dukumpi h.s.		
Jálpa h.s.	15 56 18	170
Pansara „	30 9 11	171
Mátá-ká-húrá, IX	108 53 48	170
Tiki No. 2 „	168 5 38	173
Fulrar, LXXVI		
Dholkí Hill Mark	199 30 12	246
Gangasara, LXV		
Láljí Hill Mark	280 7 0	228
Ghatana, CV		
Sháhtera Hill Mark	225 12 16	290
Amír Pír Dome	302 14 31	281
Goginda h.s.		
Dholia Hill Mark	41 1 55	212
Majaurí Temple	176 22 21	215
Koman h.s.	221 19 1	211
Goginda Temple	241 43 21	214
Ter, XXXIV	248 7 16	211
Gopalpura, XXV		
Nímach Old Residency	203 48 26	185
Govardhan h.s.		
Náthdwára Fort Bastion	2 7 25	205
Náthdwára Temple	2 22 28	206
Ter, XXXIV	50 55 28	203
Manja Temple	181 20 28	207
Bada Aro „	205 13 33	208
Kakraulí Palace	209 15 3	209
Tiki, XXXIII	289 1 8	203
Natiwás White Building	319 47 33	204
Gunjia h.s.		
Chánga, LXXX	25 23 39	332
Pátátonk h.s.	112 51 59	333
Náríthal „	167 35 57	334
Rámsar Hill Mark	219 23 3	339
Sandohar, LXXVIII	309 10 29	332
Guraria, XVI		
Khanwára s.	127 44 50	183
Jhálrápátan Cant. Palace	214 30 25	180
Jhálrápátan Temple No. 1	216 10 6	181
Jhálrápátan „ No. 2	216 21 42	182
Mata-Pír-kí-Dongrí h.s.	249 32 42	179
Guru Sikkar, XLII		
Achalgarh Temple	14 0 52	219
Abú House	46 21 28	224
Arbada Deví h.s.	55 21 27	222
Sirohí Dome	198 55 14	221
Haidarabad s.		
Aungarh h.s.	31 7 15	343
Kotrí s.	64 42 55	346
Rakhrái h.s.	346 32 6	343

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
HARIMANI, XCVI			
Amír's Tomb No. 1		93 46 45	262
Amír's „ No. 2		94 13 20	264
Amír's „ No. 3		100 30 4	261
Mor-ka-got Dome		144 17 43	266
HATNI, VII			
Rágogarh Hill Fort		20 1 7	157
Kharlí	h.s.	48 38 36	156
Megnáth Hill Mark		101 5 6	162
Guna Hill Temple		197 44 48	159
Jaynagar	s.	209 53 48	153
HILALA, CII			
Shaikh Radan	h.s.	35 45 36	284
Saiyid Alí Pír Dome		54 5 33	286
Dholmárí	„	79 40 22	282
Lagárí Hill Mark		160 18 50	278
Amír Pír Dome		194 54 33	280
Súnda Dome		219 27 48	277
JALPA h.s.			
Dáwa, X		18 57 3	165
Rangáon, XII		68 54 45	164
Máta-ká-húrá, IX		162 21 50	164
Pansara	h.s.	193 0 54	168
Dukúmpí	„	195 54 53	170
Amírpura	„	255 49 47	166
Rájgarh Palace		285 11 55	174
JAMUNIA h.s.			
Kálápahár Hill		19 1 28	327
Síhor Residency		34 27 8	328
Síhor, Mahádeo's Temple		35 55 27	329
Síhor, Ganesha's Temple		50 33 40	330
Búdí	s.	85 35 49	305
Ráipúr Chaukí		136 6 57	331
Pánbiár	h.s.	159 7 38	304
Jernia Hill Tree		226 10 50	325
Bagonia	„	226 46 42	304
Manwábhán Peak		262 29 54	323
JASMA h.s.			
Tána, XXIX		3 7 15	188
Bharak, XXXI		197 36 9	188
Modia	h.s.	216 5 32	190
JAYNAGAR s.			
Salot, V		5 17 34	154
Hatní, VII		29 55 11	153
Guna Hill Temple		180 3 30	159
Rámpúr, IV		336 20 41	153
JERAJ, XLIII			
Dísa Cantonment		61 30 18	225
Achalgarh Temple		230 54 20	220
JHARRAK h.s.			
Aungarh	h.s.	166 10 25	344
Rakhrái	„	231 45 42	345
Kanád, CI		317 29 2	344
JHOK s.			
Dadúri, CIII		145 12 57	272
JHOK s.			
Kanád, CI		203 24 49	271
Chútli, C		299 0 24	271
JHUND, LXVI			
Súrtonk Hill Mark		13 29 1	230
Karínáth-ka-bhit Hill Mark		53 26 55	231
KAKEJA, XCVIII			
Molásan Dome No. 3		118 20 30	269
KALWA h.s.			
Agar Cantonment Flag		0 42 13	176
Kúsalpúrá, XIII		224 25 57	175
Rangáon, XII		285 55 55	175
KANAD, CI			
Jhok	s.	23 26 15	271
Jhok Temple		25 1 27	273
Dádu Masjid		123 30 34	275
Jharrak	h.s.	137 32 5	344
Jharrak House		137 38 26	276
Aungarh	„	149 18 18	342
Rakhrái	„	191 22 33	341
Muhammad Khán's Tánda		216 31 23	270
KANNAGAR, XXXVIII			
Erinpura Cantonment		125 58 3	216
KARA, CVI			
Jangsháí Hill		337 7 58	291
Dome No. 2		340 40 41	295
KARIBHIT, LXIX			
Kusalkot Hill Mark		123 51 13	234
Sama „		150 35 48	235
Kála Thúra „		215 47 19	232
KAROTHOL, CIV			
Conical Hill Tomb		21 41 28	293
Dome No. 1		24 15 52	294
Jangsháí Hill		76 12 5	291
Lagárí Hill Mark		218 51 13	279
Shaikh Radan	h.s.	299 43 24	284
Dholmárí	„	302 17 3	282
Saiyid Alí Pír Dome		354 47 16	286
KARURA h.s.			
Pátátonk	h.s.	7 10 23	335
Súbrí	„	58 36 22	336
Umarkot	s.	146 3 59	340
Náríthal	h.s.	290 38 49	335
KAT-BAMAN, XCVII			
Hasan Alí's Dome		69 55 30	268
Bela-ka-Masjid		191 0 19	267
Amír's Tomb No. 2		206 54 56	264
Amír's „ No. 1		207 4 33	262
Amír's „ No. 3		208 30 32	261
Jhún Dome		244 59 21	260
KETWAS h.s.			
Karaia Hill Fort		48 20 21	308
Gúpa Hill Mark		49 53 48	310
KETWAS h.s.			
Singpúr	h.s.	55 29 55	300
Ulia	„	110 9 54	299
Bhora	„	172 15 18	299
Somgarh Fort		209 54 58	307
Sagoní Barkhera Hill		331 36 38	315
Párdí Peak		340 34 18	313
Ratwa	„	341 10 39	301
Bagrázmátha Hill Tree		352 50 0	316
KHAJURI, XVII			
Chendwása	h.s.	76 45 5	184
KHANWARA s.			
Nimthúr, XVIII		109 3 23	183
Gurária, XVI		307 43 48	183
KHARLI h.s.			
Amála	h.s.	11 5 11	160
Hatní, VII		228 33 33	156
Salot, V		294 45 32	156
Deobárí	„	339 57 41	155
KIL, LXXIX			
Ságror Hill Mark		32 15 56	250
Pelora „		70 17 41	251
Chumpání „		334 18 7	249
KOMAN h.s.			
Goginda Temple		34 15 46	214
Goginda	h.s.	41 20 13	211
Majaurí Temple		54 27 38	215
Batála „		266 18 30	213
Ter, XXXIV		284 39 40	200
Lakarwas, XXXII		317 40 40	200
KOTRI s.			
Aungarh	h.s.	23 10 3	346
Haidarábád	s.	244 41 32	346
KUSALPURA, XIII			
Kalwa	h.s.	44 33 25	175
Masrúrí Hill Temple		88 39 48	177
LADDA h.s.			
Soapdár Laggarí Mosque		107 22 23	257
Wanga Bázár		123 5 19	258
Mír Abdul Mosque		126 31 10	259
Pangra, LXXXVIII		151 9 54	255
Arní	h.s.	175 37 3	255
Pábú Hill Mark		290 56 45	256
LAKARWAS, XXXII			
Udaipúr Temple		120 47 0	201
Koman	h.s.	137 47 22	200
Lakarwás Hill Temple		178 13 29	202
Kanor Building		274 54 28	196
LOSALLI, I			
Tánk	s.	171 53 25	142
LUNKI, LXXI			
Tonk Hill Mark		135 58 59	239
Kusalkot „		172 33 20	234
Sama „		207 14 47	235

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
Mairab-ka-Shahar, LXXXV			
Arní	h.s.	12 15 16	252
Manjakar, LXXXIV			
Súbrí	h.s.	235 22 0	338
Mard, XL			
Achalgarh Temple		141 7 44	219
Pesua Hill Temple		183 0 50	217
Birwára	„	184 37 40	218
Marwar, XXXV			
Dholia Hill Mark		168 49 21	210
Udaipúr Temple		214 26 8	201
Lakarwás Hill Temple		242 23 12	202
Mata-ka-hura, IX			
Patlápání Hill Mark		192 23 54	163
Tikí No. 2	h.s.	274 56 24	172
Dukúmpí	„	288 50 35	170
Pansara	„	303 17 51	168
Amírpura	„	326 19 37	166
Jálpa	„	342 20 2	164
Mata-Pir-ki-Dongri h.s.			
Gurária, XVI		69 34 2	179
Jhálrápátan Temple No. 2		198 44 37	182
Jhálrápátan „ No. 1		198 56 15	181
Bánskati, XIV		220 45 49	179
Mendki, XXVI			
Jáwad Temple		15 52 10	186
Mendki	s.	125 16 48	186
Mendki s.			
Jáwad Temple		0 18 15	186
Mendki, XXVI		305 16 30	186
Modia h.s.			
Tána, XXIX		17 6 56	189
Jasma	h.s.	36 8 16	190
Bharak, XXXI		150 48 10	189
Aloli Temple		163 36 20	199
Lakora „		170 28 30	197
Poní Hill Temple		195 50 50	198
Naga-Sha, XCIX			
Rakhrái	h.s.	141 7 45	341
Muhammad Khán's Tánda		163 9 44	270
Bela-ka-Masjid		250 21 41	267
Mor-ka-got Dome		256 44 22	266
Amír's Tomb No. 2		297 28 15	265
Amír's „ No. 1		297 52 20	263
Nandna, VIII			
Patlápání Hill Mark		116 47 16	163
Megnáth „		179 24 46	162
Rágogarh Hill Fort		251 36 46	158
Narithal h.s.			
Pátátonk	h.s.	44 21 8	334
Karúra	„	110 41 22	335
Rámsar Hill Mark		272 43 14	339
Gungia	„	347 34 54	334
Nimthur, XVIII			
Khanwára	s.	288 57 11	183
Masrúrí Hill Temple		350 45 12	178
Padria, LXXXII			
Pábú Hill Mark		17 33 51	254
Arní	h.s.	69 28 52	252
Sagror Hill Mark		315 16 2	250
Pelora	„	323 20 57	251
Pakka Kothi, LXXII			
Sehar Hill Mark		32 55 32	241
Singara	„	47 24 0	240
Tattal	„	295 26 37	236
Bhisiwádí	„	322 30 11	237
Támpí	„	359 12 43	238
Panbiar h.s.			
Singpúr	h.s.	222 42 13	303
Talái Tonk Hill		263 57 7	319
Bagonia	„	283 31 56	303
Jernia Hill Tree		295 21 5	324
Jamúnia	„	339 5 49	304
Búdí	s.	355 8 32	305
Kálápahár Hill		355 26 11	326
Panchawa, XV			
Masrúrí Hill Temple		146 38 27	177
Pangra, LXXXVIII			
Arní	h.s.	317 11 24	253
Ladda	„	331 7 4	255
Pansara h.s.			
Jálpa	h.s.	13 1 53	168
Mátá-ká-húrá, IX		123 20 38	168
Tikí No. 2	„	189 4 1	172
Dukúmpí	„	210 8 45	171
Amírpura	„	347 13 16	169
Patatonk h.s.			
Sodáchar, LXXXIII		34 58 56	337
Súbrí	h.s.	161 50 28	336
Karúra	„	187 9 52	335
Náríthal	„	224 18 4	334
Gungia	„	292 47 52	333
Chánga, LXXX		333 10 44	333
Rakhrai h.s.			
Kanád, CI		11 23 54	341
Jharrak	h.s.	51 50 6	345
Aungarh	„	85 35 18	342
Haidarábád	s.	166 33 31	343
Nága-Sha, XCIX		321 4 11	341
Rampur, IV			
Jaynagar	s.	156 24 12	153
Araun Temple		172 51 58	149
Sonárí	h.s.	217 11 42	145
Sarái	„	235 46 57	144
Tánk	s.	245 8 59	143
Panwárí Temple		251 35 46	151
Rampura, XX			
Chendwása	h.s.	349 38 34	184
Rangaon, XII			
Agar Cantonment Flag		61 55 31	176
Kalwa	h.s.	106 4 47	175
Jálpa	„	248 47 22	164
Ratwa h.s.			
Manwábhán Peak		15 49 13	322
Beta Hill		20 19 11	321
Bagrázmátha Hill Tree		27 28 26	316
Bagonia	h.s.	56 57 26	302
Píparkhera Hill Tree		100 30 22	318
Singpúr	„	119 23 39	301
Gúpa Hill Mark		137 54 35	311
Karaia Hill Fort		141 37 42	309
Ketwás	„	161 12 29	301
Sagoní Barkhera Hill		179 5 41	315
Rojhra, LXXV			
Dholkí Hill Mark		121 55 13	246
Milkam	„	167 30 7	247
Dilbhar	„	181 25 18	248
Darár	„	195 36 46	244
Narchar	„	208 59 22	243
Sahlji, CVII			
Jangsháí Hill		265 7 9	292
Saiyid Alí Pír Dome		284 22 53	287
Dome No. 1		294 4 25	294
Dome No. 2		296 27 48	295
Conical Hill Tomb		307 14 49	293
Salot, V			
Deobárí	h.s.	24 5 44	147
Kharlí	„	114 51 5	156
Rágogarh Hill Fort		167 25 1	157
Jaynagar	s.	185 16 41	154
Sandohar, LXXVIII			
Gungia	h.s.	129 12 6	332
Milkam Hill Mark		236 21 7	247
Dilbhar	„	263 6 18	248
Sarai h.s.			
Rámpúr, IV		55 50 33	144
Salaun Masjid		94 29 12	152
Sonárí	h.s.	136 46 10	146
Súrantál, (III)		327 10 49	144
Sawaji, CIX			
Halálú Tomb		105 20 39	296
Shekh Radan h.s.			
Tatta Sarái		49 6 8	288
Maklí Tomb		53 0 15	289
Dholmárí	h.s.	116 40 23	285
Károthol, CIV		119 46 30	284
Hilaia, CII		215 44 47	284
Singpur h.s.			
Talái Tonk Hill		1 36 26	319

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
SINGPUR	h.s.		
Pánbiár	h.s.	42 45 57	303
Kantora Hill Mark		145 2 20	312
Ulia	„	164 29 28	300
Ketwás	„	235 26 24	300
Párdí Peak		297 48 59	313
Ratwa	„	299 18 18	301
Píparkhera Hill Tree		308 29 16	318
Bagonia	„	342 34 28	302
SODACHAR, LXXXIII			
Súbrí	h.s.	180 12 15	337
Pátátonk	„	214 57 53	337
SONARI	h.s.		
Salaun Masjid		14 31 47	152
Rámpúr, IV		37 14 20	145
Araun Temple		66 34 9	150
Sarái	h.s.	316 45 12	146
Súrantál, (III)		324 48 4	145
Panwárí Temple		333 33 25	151
SUBRI	h.s.		
Sodáchar, LXXXIII		0 12 16	337
Manjákar, LXXXIV		55 28 22	338
Umarkot	s.	190 29 30	340
Karúra	h.s.	238 34 49	336
Pátátonk	„	341 49 26	336
SUNDA, XLIV			
Arbada Deví	h.s.	303 41 39	223
Nímaj Temple		335 50 27	226
SURANTAL, (III)			
Tánk	s.	123 10 6	142
Sonárí	h.s.	144 51 36	145
Sarái	„	147 13 23	144

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
TAMPI, LX			
Láljí Hill Mark		145 53 34	227
TANA, XXIX			
Dilwára Hill Temple		92 3 55	194
Hánd	„	169 1 51	187
Jasma	h.s.	183 6 55	188
Modia	„	197 3 52	189
Arní Hill Temple		197 8 35	191
Chítorgarh Hill Fort		247 30 12	192
Chítorgarh Column		247 48 11	193
TANK	s.		
Rámpúr, IV		65 11 12	143
Araun Temple		115 24 58	149
Súrantál, (III)		303 6 9	142
Losalli, I		351 52 32	142
TER, XXXIV			
Dholia Hill Mark		60 45 56	210
Goginda	h.s.	68 9 49	211
Koman	„	104 41 1	200
Batála Temple		128 51 12	213
Govardhan	„	230 50 22	203
Dilwára Hill Temple		293 55 55	195
TIKI, XXXIII			
Dilwára Hill Temple		24 9 45	194
Natiwás White Building		52 31 4	204
Náthdwára Fort Bastion		83 0 4	205
Náthdwára Temple		91 32 33	206
Govardhan	h.s.	109 1 52	203
Manja Temple		157 48 28	207
Bada Aro Temple		179 55 2	208
Kakraulí Palace		197 57 32	209

Name of station with azimuths of surrounding points		° ′ ″	Reference to triangle containing distance
TIKI No. 2	h.s.		
Pansara	h.s.	9 4 16	172
Mátá-ká-húrá, IX		94 59 26	172
Dukúmpí	„	348 5 27	173
TINSIA, III			
Naya Kila Mark		46 41 28	148
Deobárí	h.s.	64 14 3	147
Bhora	„	357 34 10	297
TUGUSAR, LXX			
Tattal Hill Mark		10 55 39	236
Bhisiwádí	„	51 8 28	237
Támpí	„	55 26 43	238
Pelú	„	329 21 24	233
ULIA	h.s.		
Kantora Hill Mark		53 8 2	312
Dand, VI		171 22 2	298
Bhora	h.s.	229 50 43	298
Ketwás	„	290 5 13	299
Gúpa Hill Mark		317 20 20	310
Singpúr	„	344 28 18	300
UMARKOT	s.		
Súbrí	h.s.	10 29 58	340
Karúra	„	326 2 54	340
VIRARIA, LXVII			
Kála Thúra Hill Mark		164 11 22	232

August 1874.

J. B. N. HENNESSEY.

KARACHI LONGITUDINAL 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 Hill Mark. (*Holkar's Territory*) ° ′ ″ λ 24 26 57·85 L 75 41 20·85	**Adúri, XC.** (*Vide page* 17—*B.*) ° ′ ″ λ 24 50 21·02 L 69 5 52·13 H 56 *h* 20 No. 113	**Ajabgarh Hill Mark.** (*Sindhia's Territory*) ° ′ ″ λ 24 6 14·95 L 77 8 31·56
Abú House. (*Sirohí*) Captain Anderson's house. λ 24 35 37·1 L 72 45 16·1 No. 224	**Agar, II.** (*Vide page* 5—*B.*) λ 23 57 3·35 L 77 27 27·46 H 1811 *h* 4 No. 4	**Akoria, LXI.** (*Vide page* 13—*B.*) λ 24 40 43·31 L 71 18 58·74 H 56 *h* 8 No. 76
Achalgarh Temple, (*Sirohí*) Highest. λ 24 36 54·4 L 72 48 33·0 Nos. 219, 220	**Agar Cantonment Flag.** (*Sindhia's Territory*) λ 23 43 44·0 L 76 3 30·4 No. 176	**Alamkhán, XCV.** (*Vide page* 18—*B.*) λ 24 49 31·23 L 68 46 14·56 H 67 *h* 32 No. 119

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

Alam-Shahar, LXVIII.
(*Vide page* 14—*B.*)

	o ′ ″
λ	24 52 2·03
L	70 53 1·85
H	492
h	3

Nos. 87, 88

Alolí Temple.
(*Udaipúr*)

λ	25 6 49·3
L	74 20 16·2

No. 199

Amála h.s.
(*Sindhia's Territory*)

λ	24 9 52·20
L	77 1 43·62

No. 160

Amír Pír Dome.
(*Jharrak*)

λ	25 0 11·3
L	68 7 34·1

Nos. 280, 281

Amírpura h.s.
(*Rájgarh*)

λ	24 2 3·72
L	76 48 3·58

Nos. 166, 167

Amírsha, LXXXVI.
(*Vide page* 16—*B.*)

λ	25 0 9·68
L	69 23 6·31
H	47
h	24

Nos. 107, 110

Amír's Tomb No. 1.
(*Muhammad Khán's Tánda*)

λ	24 59 9·2
L	68 40 28·1

Nos. 262, 263

Amír's Tomb No. 2.
(*Muhammad Khán's Tánda*)

λ	24 59 11·3
L	68 40 27·8

Nos. 264, 265

Amír's Tomb No. 3.
(*Muhammad Khán's Tánda*)

λ	24 59 35·5
L	68 40 57·1

No. 261

Anjiní Hill,
(*Udaipúr*) Staff.

λ	24 14 30·2
L	74 10 37·6

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

Aramlia, XXIII.
(*Vide page* 8—*B.*)

	o ′ ″
λ	24 25 7·27
L	75 1 32·87
H	1532
h	6

No. 30

Araun Fort,
(*Sindhia's Territory*) Highest tower.

λ	24 22 54·5
L	77 27 42·8

Araun Temple,
(*Sindhia's Territory*) S. of fort.

λ	24 22 44·3
L	77 27 29·9

Nos. 149, 150

Arbada Deví h.s.
(*Sirohí*)

λ	24 36 20·45
L	72 44 56·96

Nos. 222, 223

Arní h.s.
(*Umarkot*)

λ	24 39 53·68
L	69 20 26·06

Nos. 252, 253

Arní Hill Temple.
(*Udaipúr*)

λ	25 4 22·8
L	74 20 57·5

No. 191

Arniála, LXXIV.
(*Vide page* 15—*B.*)

λ	24 48 17·18
L	70 13 5·51
H	485
h	6

Nos. 96, 97

Arniála Hill Mark.
(*Umarkot*)

λ	25 7 5·41
L	70 32 53·67

Atithol, XLIX.
(*Vide page* 12—*B.*)

λ	24 42 24·61
L	72 6 28·89
H	652
h	3

Nos. 61, 65

Aulra House,
(*Kotah*) Paká.

λ	24 14 35·9
L	76 48 2·7

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

Aungarh h.s.
(*Jharrak*) On a hill so called about 2·5 miles W. S. W. of Shaikh Sumár-ká-gáon, about 4 miles from W. bank of Indus and to S. of Jharrak town; Kárdárí Jharrak. Marked by a circular masonry platform 1 ft. high with a mark-stone at top.

	o ′ ″
λ	25 9 40·20
L	68 15 57·37

No. 342

Bada Aro Temple.
(*Udaipúr*)

λ	24 59 30·1
L	73 53 11·2

No. 208

Bagonia h.s.
(*Bhopál*) On a small flat hill 1 mile W. of village so called and 1 mile S. E. of Chenwára village; Thánah Darai. Marked by a paká pillar 2 ft. high with mark-stones at top and bottom.

λ	23 23 5·62
L	77 18 46·95

No. 302

Bagrázmátha Hill Tree.
(*Bhopál*) Also called Hinota Hill Tree.

λ	23 24 25·6
L	77 25 35·1

Nos. 316, 317

Bálagarra, XXIV.
(*Vide page* 8—*B.*)

λ	24 10 21·90
L	75 0 15·84
H	1804
h	3

No. 31

Balhar Hill Tree.
(*Tonk*)

λ	24 2 4·7
L	77 21 30·0

Bam Márí Hill Staff.
(*Umarkot*)

λ	24 40 20·8
L	69 25 56·4

Bánskati, XIV.
(*Vide page* 7—*B.*)

λ	24 34 50·10
L	76 18 27·11
H	1463
h	4

No. 14

Bargáon, XLV.
(*Vide page* 11—*B.*)

λ	24 40 29·02
L	72 17 22·84
H	1809
h	0

No. 58

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

Barí Hill Mark.
(*Tonk*)

	° ′ ″
λ	24 11 54·85
L	77 36 38·72

Barra Sádri, XXVII.
(*Vide page* 9—*B.*)

λ	24 23 21·01
L	74 31 42·24
H	1954
h	2

Nos. 36, 37

Baserí Hill Mark.
(*Sindhia's Territory*)

λ	24 16 21·34
L	76 54 16·90

Batála Temple.
(*Udaipúr*) White temple on border of tank.

λ	24 48 3·9
L	73 38 7·6

No. 213

Baurí Hill Mark.
(*Sindhia's Territory*)

λ	23 55 39·98
L	77 21 26·55

Bela-ka-Masjid.
(*Muhammad Khán's Tánda*)

λ	25 1 46·2
L	68 38 50·5

No. 267

Belka, XXXIX.
(*Vide page* 10—*B.*)

λ	24 46 54·71
L	73 11 43·48
H	3599
h	6

No. 50

Berkherí Hill Mark.
(*Tonk*)

λ	24 12 6·25
L	75 55 55·96

Berkherí Hill Tree.
(*Rájgarh*)

λ	23 52 59·4
L	76 24 51·1

Beta Hill.
(*Bhopál*) Bush.

λ	23 15 51
L	77 22 49

No. 321

Bhalar Hill Mark.
(*Umarkot*)

λ	25 19 54·48
L	69 54 31·47

Bhándí h.s.
(*Tonk*)

λ	24 2 15·52
L	77 37 32·25

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

Bhántolái Hill Mark.
(*Jodhpúr*)

	° ′ ″
λ	24 58 32·14
L	71 25 28·42

Bharak, XXXI.
(*Vide page* 9—*B.*)

λ	25 8 22·17
L	74 18 40·16
H	2262
h	3

No. 42

Bhilgáon, LXIV.
(*Vide page* 13—*B.*)

λ	24 41 34·19
L	71 7 11·00
H	100
h	4

No. 84

Bhiswádí Hill Mark.
(*Umarkot*)

λ	24 44 12·03
L	70 31 34·68

No. 237

Bhora h.s.
(*Sindhia's Territory*) On a hill so called, 1·50 miles S. E. of Gunnikheri, 1·75 miles S. of Arera, 2 miles W. of Majítgarh and 16 ft. S.E. of Bhora Idol; in iláka Birsia; marked by a paká pillar 1 ft. high with mark-stones at top and bottom.

λ	23 52 40·46
L	77 21 36·08

No. 297

Bhúmria Fort,
(*Sindhia's Territory*) Bastion.

λ	24 15 2·9
L	76 42 9·0

Birjápúr Tiled Bungalow.
(*Rájgarh*)

λ	24 0 44·5
L	76 46 10·5

Birona, XLVI.
(*Vide page* 11—*B.*)

λ	24 26 38·64
L	72 15 31·69
H	673
h	9

No. 59

Birwára Hill Temple.
(*Sirohí*)

λ	24 49 59·4
L	73 2 5·5

No. 218

Bol, (XXIII).
(*Vide page* 19—*B.*)

λ	24 54 36·57
L	67 23 10·44
H	491
h	3

No. 137

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

Bolálio, (XXV).
(*Vide page* 19—*B.*)

	° ′ ″
λ	25 8 56·17
L	67 23 52·61
H	1091
h	3

Nos. 138, 141

Bonik, XLI.
(*Vide page* 11—*B.*)

λ	25 3 51·50
L	72 54 21·85
H	2098
h	3

No. 55

Borikalor, XXX.
(*Vide page* 9—*B.*)

λ	24 20 52·34
L	74 15 2·32
H	1599
h	4

No. 39

Búda, XXI.
(*Vide page* 8—*B.*)

λ	24 14 11·86
L	75 10 43·06
H	1525
h	5

No. 27

Búdí s.
(*Bhopál*) On rising ground 1 mile S. of village so called and 47 ft. W. of a tree; thánah Síhor; marked by a paká pillar 5 ft. high with mark-stones at top and bottom.

λ	23 14 56·54
L	77 6 10·47

No. 305

Búgia, LXXXI.
(*Vide page* 16—*B.*)

λ	24 56 11·09
L	69 36 35·65
H	278
h	3

No. 104

Búgia Hill Staff.
(*Umarkot*)

λ	24 40 54·1
L	70 45 34·8

Búndí Flag,
(*Holkar's Territory*) In village.

λ	24 13 59
L	75 34 29

Butia Hill Mark.
(*Umarkot*)

λ	25 3 8·88
L	70 20 5·68

Chakábú Hill Mark.
(*Sindhia's Territory*)

λ	24 20 6·85
L	77 1 37·37

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

Chánga, LXXX.
(*Vide page* 16—*B.*)

	° ′ ″
λ	24 58 47·00
L	69 53 50·48
H	349
h	3

Nos. 101, 103

Chendwása h.s.
(*Holkar's Territory*) A platform 16 ft. square and 3 ft. high, having a central masonry pillar with a mark-stone in its summit.

λ	24 11 22·67
L	75 32 46·92

No. 184

Chítorgarh Column,
(*Udaipúr*) Not on hill.

λ	24 53 14·9
L	74 41 12·6

No. 193

Chítorgarh Hill Fort,
(*Udaipúr*) Minaret (column on top of hill).

λ	24 53 30·3
L	74 41 29·8

No. 192

Chumpání Hill Mark.
(*Umarkot*)

λ	24 33 29·16
L	69 57 5·60

No. 249

Chútli, C.
(*Vide page* 18—*B.*)

λ	24 46 19·67
L	68 26 8·04
H	72
h	44

Nos. 126, 128

Conical Hill Tomb.
(*Jharrak*)

λ	24 42 17·4
L	67 50 59·5

No. 293

Dádú Masjid.
(*Muhammad Khán's Tánda*)

λ	24 57 7·9
L	68 22 55·6

No. 275

Dadúri, CIII.
(*Vide page* 18—*B.*)

λ	24 59 44·11
L	68 13 3·35
H	174
h	3

Nos. 130, 131

Dand, VI.
(*Vide page* 6—*B.*)

λ	24 4 2·62
L	77 8 33·01
H	1736
h	4

No. 7

Dang-ka-basti, XCII.
(*Vide page* 17—*B.*)

	° ′ ″
λ	24 54 50·20
L	68 56 0·05
H	72
h	24

No. 117

Darár Hill Mark.
(*Umarkot*)

λ	25 9 0·75
L	70 20 18·31

No. 244

Dáwa, X.
(*Vide page* 6—*B.*)

λ	23 49 18·04
L	76 39 25·14
H	1601
h	3

No. 17

Dáwal, LV.
(*Vide page* 12—*B.*)

λ	24 50 33·33
L	71 45 19·73
H	161
h	6

No. 72

Deobárí h.s.
(*Sindhia's Territory*)

λ	24 2 11·08
L	77 11 19·05

No. 147

Dhamba-ka-Thalí Hill Mark.
(*Jodhpúr*)

λ	25 6 48·74
L	71 6 9·62

Dhamnár, XIX.
(*Vide page* 8—*B.*)

λ	24 11 37·54
L	75 32 27·93
H	1591
h	1

No. 24

Dhárindera, LXXIII.
(*Vide page* 15—*B.*)

λ	25 0 2·14
L	70 26 44·00
H	539
h	9

No. 92

Dhaukálí Hill Mark.
(*Umarkot*)

λ	25 5 43·29
L	70 43 44·25

Dhingpúra, LVIII.
(*Vide page* 13—*B.*)

λ	24 43 46·31
L	71 28 17·52
H	92
h	14

No. 74

Dholia Hill Mark.
(*Udaipúr*)

	° ′ ″
λ	24 43 11·91
L	73 31 33·60

No. 210

Dholkí Hill Mark.
(*Umarkot*) Marked by a platform 1 ft. high.

λ	25 1 33·63
L	70 9 28·95

No. 246

Dholmárí h.s.
(*Jharrak*)

λ	24 51 30·81
L	67 59 55·29

Nos. 282, 283

Didáwa, LXII.
(*Vide page* 13—*B.*)

λ	24 51 19·36
L	71 21 24·87
H	212
h	2

Nos. 77, 79

Dilbhar Hill Mark.
(*Umarkot*)

λ	25 4 46·04
L	70 16 57·06

No. 248

Dilwára Hill Temple.
(*Udaipúr*)

λ	24 43 53·6
L	73 47 25·5

Nos. 194, 195

Dísa Cantonment.
(*Pálanpúr*) Bungalow used as a church.

λ	24 15 44·0
L	72 13 55·4

No. 225

Dome No. 1.
(*Jharrak*) On hill.

λ	24 45 30·6
L	67 51 54·8

No. 294

Dome No. 2.
(*Jharrak*) With white building near it.

λ	24 46 54·1
L	67 47 29·1

No. 295

Dongra Hill Temple.
(*Sindhia's Territory*)

λ	24 7 58·7
L	77 16 58·9

No. 161

Drábi, LXXVII.
(*Vide page* 15—*B.*)

λ	24 43 44·01
L	70 6 18·61
H	382
h	3

No. 99

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

Dukúmpí h.s.
(*Kotah*)

	° ′ ″
λ	24 11 43·05
L	76 47 7·35

Nos. 170, 171

Durimána Hill Peak,
(*Jodhpúr*) Highest.

λ	25 11 45
L	71 28 6

Erinpura Cantonment,
(*Godwár*) Hospital.

λ	25 8 26·4
L	73 6 21·3

No. 216

Farráha, LXXXVII.
(*Vide page* 17—*B.*)

λ	24 55 41·58
L	69 13 56·39
H	58
h	15

No. 111

Fulrár, LXXVI.
(*Vide page* 15—*B.*)

λ	24 52 56·48
L	70 6 7·90
H	474
h	3

No. 98

Gangasára, LXV.
(*Vide page* 14—*B.*)

λ	24 58 40·45
L	71 14 1·82
H	428
h	*Not forthcoming.*

No. 81

Gárah Fort.
(*Sindhia's Territory*)

λ	24 37 10
L	77 14 54

Ghatána, CV.
(*Vide page* 19—*B.*)

λ	25 3 56·83
L	68 1 1·99
H	230
h	3

No. 132

Goginda h.s.
(*Udaipúr*)

λ	24 44 56·07
L	73 33 12·83

Nos. 211, 212

Goginda Temple.
(*Udaipúr*) Large white temple.

λ	24 45 26·5
L	73 34 14·8

No. 214

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

Gopálpúra, XXV.
(*Vide page* 8—*B.*)

	° ′ ″
λ	24 17 33·54
L	74 49 23·29
H	1855
h	5

No. 32

Gorsál Hill Mark.
(*Sindhia's Territory*)

λ	24 23 41·64
L	76 57 13·33

Govardhan h.s.
(*Udaipúr*)

λ	24 56 10·75
L	73 51 28·19

No. 203

Gulásan, LIII.
(*Vide page* 12—*B.*)

λ	24 41 7·79
L	71 46 26·31
H	221
h	15

No. 68

Guna Dák Bungalow.
(*Sindhia's Territory*)

λ	24 38 48·3
L	77 21 30·1

Guna Hill Temple.
(*Sindhia's Territory*)

λ	24 39 57·5
L	77 19 36·5

No. 159

Gungia h.s.
(*Umarkot*) Marked by a platform 1 ft. high.

λ	25 5 54·11
L	69 57 32·91

No. 332

Gúpa Hill Mark.
(*Dhár*) On centre of long flat hill.

λ	23 37 42·86
L	77 18 58·93

Nos. 310, 311

Gurária, XVI.
(*Vide page* 7—*B.*)

λ	24 25 32·46
L	76 7 29·34
H	1360
h	5

No. 15

Gúrú Sikkar, XLII.
(*Vide page* 11—*B.*)

λ	24 38 58·39
L	72 49 6·91
H	5650
h	4

Nos. 52, 56

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

Haidarábád s.
(*Haidarábád*) On an isolated and commanding tower in principal fort, adjoining the southern face of the city and about 12 ft. W. of the flag-staff with which the tower is surmounted. Denoted by a mark-stone on top of a circular masonry platform 1 ft. high. The height of the tower itself is about 53 ft.

	° ′ ″
λ	25 23 4·92
L	68 24 51·06

No. 343

Hakimáni, XCVI.
(*Vide page* 18—*B.*)

λ	24 58 52·01
L	68 45 15·08
H	78
h	38

Nos. 120, 122

Halálú Tomb,
(*Karáchí*) On hill.

λ	25 15 19·5
L	67 25 51·8

No. 296

Hánd Hill Temple.
(*Udaipúr*) Also called Sánd Hill Temple.

λ	25 32 45·4
L	74 3 7·3

No. 187

Hasan Alí's Dome.
(*Muhammad Khán's Tánda*)

λ	24 49 44·7
L	68 27 36·4

No. 268

Hatní, VII.
(*Vide page* 6—*B.*)

λ	24 30 29·18
L	77 16 17·43
H	1822
h	6

No. 9

Hilaia, CII.
(*Vide page* 18—*B.*)

λ	24 52 24·51
L	68 5 17·67
H	121
h	3

No. 129

Honitáli, LIX.
(*Vide page* 13—*B.*)

λ	24 35 4·88
L	71 26 1·83
H	134
h	1

No. 75

Indus River Station.
(*Sháh Bandar*) On left bank.

λ	24 49 52
L	68 6 20

Islámkot Hill Mark.
(*Umarkot*)

λ	24 42 21·51
L	70 12 43·51

No. 245

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

Jálpa h.s.
(*Sindhia's Territory*)

	° ′ ″
λ	24 1 4·72
L	76 43 48·89

Nos. 164, 165

Jamúnia h.s.
(*Bhopál*) On a small hill about 1 mile E. of village so called and close N. of foundation marks of an old chauki; thánah Síhor. There is a mark-stone at the surface of the platform and another 2 ft. below it.

λ	23 15 11·49
L	77 9 40·06

No. 304

Ján Mahamad, LXXXIX.
(*Vide page* 17—*B.*)

λ	25 4 15·66
L	69 15 17·12
H	54
h	10

No. 115

Jangsháí Hill,
(*Karáchí*) Pillar.

λ	24 51 38·2
L	67 46 27·3

Nos. 291, 292

Jasma h.s.
(*Udaipúr*)

λ	24 56 31·77
L	74 14 32·53

No. 188

Jáwad Flag,
(*Nímach*) In town.

λ	24 35 54
L	74 54 16

Jáwad Temple,
(*Nímach*) In a garden E. of and near town so called.

λ	24 35 56·0
L	74 54 56·4

No. 186

Jaynagar s.
(*Sindhia's Territory*) On S. E. corner of ruined building N. W. of town.

λ	24 35 45·26
L	77 19 36·21

Nos. 153, 154

Jeráj, XLIII.
(*Vide page* 11—*B.*)

λ	24 24 59·77
L	72 32 29·86
H	3575
h	0

No. 53

Jernia Hill Tree.
(*Bhopál*)

λ	23 21 11·2
L	77 16 26·2

Nos. 324, 325

Jhálrápátan Cantonment Palace,
(*Kotah*) Rája's.

	° ′ ″
λ	24 35 23·0
L	76 14 53·5

No. 180

Jhálrápátan Temple No. 1.
(*Kotah*) With white flag in town.

λ	24 32 12·0
L	76 12 48·7

No. 181

Jhálrápátan Temple No. 2.
(*Kotah*) Highest, in town.

λ	24 32 3·6
L	76 12 44·2

No. 182

Jharrak h.s.
(*Jharrak*) On the higher or western of two hills between which the town so called is situated, about 15 or 20 yds. S. W. of Deputy Collector's house. Denoted by a circular masonry platform 1 ft. high and 3 ft. in diameter with a mark-stone at top.

λ	25 3 4·46
L	68 17 44·39

Nos. 344, 345

Jharrak House.
(*Jharrak*) Deputy Collector's house, chimney.

λ	25 3 6·1
L	68 17 44·3

No. 276

Jhok s.
(*Sháh Bandar*) On highest house, belonging to Lálú Bania, S. E. of the large white temple.

λ	24 48 41·03
L	68 21 28·93

Nos. 271, 272

Jhok Temple,
(*Sháh Bandar*) Dome.

λ	24 48 52·0
L	68 21 18·7

Nos. 273, 274

Jhún Dome.
(*Muhammad Khán's Tánda*)

λ	24 55 54·2
L	68 42 5·9

No. 260

Jhúnd, LXVI.
(*Vide page* 14—*B.*)

λ	24 47 51·07
L	71 1 20·38
H	374
h	3

Nos. 83, 85

Jhúrkilí Hill Staff.
(*Umarkot*)

λ	24 45 27·6
L	70 28 35·6

Káglia Hill Mark.
(*Sindhia's Territory*)

	° ′ ″
λ	24 30 47·50
L	77 1 42·83

Kakeja, XCVIII.
(*Vide page* 18—*B.*)

λ	24 42 56·21
L	68 36 46·42
H	73
h	20

No. 127

Kakraulí Palace,
(*Udaipúr*) Highest part.

λ	25 3 34·5
L	73 56 1·1

No. 209

Kála Thúra Hill Mark.
(*Jodhpúr*)

λ	25 12 38·03
L	71 0 26·59

No. 232

Kálápahár Hill,
(*Bhopál*) Bush.

λ	23 7 24
L	77 6 46

Nos. 326, 327

Kalwa h.s.
(*Sindhia's Territory*) On a high isolated hill about 2·5 miles W. of Sampúr village, it is denoted by a mark placed on a platform of loose earth 15 inches high.

λ	24 0 20·81
L	76 3 43·69

No. 175

Kámkherá, (IV).
(*Vide page* 5—*B.*)

λ	23 59 44·93
L	77 45 34·03
H	1780
h	10

Nos. 2, 6 of Great Arc Meridional Series. *Vide* Synoptical Vol. of that Series p. 13—*A.*

Kanád, CI.
(*Vide page* 18—*B.*)

λ	24 55 55·68
L	68 24 55·36
H	88
h	42

No. 125

Kánákheri Hill Mark.
(*Sindhia's Territory*)

λ	24 20 9·25
L	77 6 24·32

Kánnagar, XXXVIII.
(*Vide page* 10—*B.*)

λ	24 58 28·78
L	73 21 27·13
H	3607
h	3

Nos. 47, 49

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

Kánoj h.s.
(*Tonk*) Over town.

	o ′ ″
λ	24 44 6·94
L	74 35 19·03

Kanor Building,
(*Udaipúr*) In centre of town.

λ	24 29 30·0
L	74 20 51·8

No. 196

Kantora Hill Mark,
(*Rájgarh*) Towards E. brow.

λ	23 43 1·94
L	77 8 51·19

No. 312

Kára, CVI.
(*Vide page* 19—*B.*)

λ	25 1 44·08
L	67 41 47·26
H	1456
h	3

No. 135

Kára Bara Hill Mark.
(*Sindhia's Territory*)

λ	24 17 51·57
L	77 6 31·04

Karaia Hill Fort,
(*Dhár*) Large tree outside and close to E. bastion.

λ	23 38 8·1
L	77 19 43·5

Nos. 308, 309

Káribhit, LXIX.
(*Vide page* 14—*B.*)

λ	25 0 28·18
L	70 50 47·97
H	595
h	3

No. 86

Karínáth-ka-bhit Hill Mark.
(*Umarkot*)

λ	24 40 3·18
L	70 49 50·31

No. 231

Károthol, CIV.
(*Vide page* 19—*B.*)

λ	24 53 46·69
L	67 55 59·65
H	260
h	3

Nos. 133, 134

Karúra h.s.
(*Umarkot*)

λ	25 18 23·19
L	69 49 2·27

No. 335

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

Kát-báman, XCVII.
(*Vide page* 18—*B.*)

	o ′ ″
λ	24 52 51·71
L	68 36 56·38
H	83
h	18

No. 123

Katiábhar Hill Mark.
(*Umarkot*)

λ	25 10 11·08
L	69 59 14·52

Ketwás h.s.
(*Dhár*) On a hill about 1·5 miles S. W. of village so called and 30 ft. E. of a Gosáín's tomb; pargana Kolokheri, iláka Birsia; marked by a paká pillar 3 ft. high with mark-stones at top and bottom, the latter being engraved on rock *in situ*.

λ	23 41 4·70
L	77 23 18·99

No. 299

Khajúri, XVII.
(*Vide page* 7—*B.*)

λ	24 14 13·63
L	75 45 55·89
H	1582
h	3

No. 21

Khankharia, LI.
(*Vide page* 12—*B.*)

λ	24 36 56·19
L	71 55 36·09
H	362
h	8

No. 62

Khanwára s.
(*Kotah*) On tower.

λ	24 27 17·83
L	76 5 0·63

No. 183

Kharbarí Hill Mark.
(*Sindhia's Territory*)

λ	24 13 33·21
L	76 41 35·39

Kharlí h.s.
(*Sindhia's Territory*) A platform 14 ft. square and 4 ft. high, having a central masonry pillar with a mark-stone in its summit.

λ	24 20 34·66
L	77 4 0·83

Nos. 155, 156

Khori, XCI.
(*Vide page* 17—*B.*)

λ	25 0 31·53
L	69 5 32·50
H	63
h	15

Nos. 114, 116

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

Kíl, LXXIX.
(*Vide page* 15—*B.*)

	o ′ ″
λ	24 46 52·76
L	69 50 2·84
H	479
h	3

No. 100

Koman h.s.
(*Udaipúr*)

λ	24 47 56·76
L	73 36 6·87

No. 200

Kosia, LII.
(*Vide page* 12—*B.*)

λ	24 46 42·58
L	71 55 58·57
H	323
h	6

Nos. 63, 67

Kotiára Fort.
(*Udaipúr*)

λ	24 57 10
L	73 54 28

Kotiára Tiki Hill,
(*Udaipúr*) Staff.

λ	24 56 29·8
L	73 54 23·2

Kotrí s.
(*Sihwán*) On Kází's house in town on mud roof of highest room, about 4 ft. from N. W. corner.

λ	25 21 41·36
L	68 21 36·43

No. 346

Kúni, CVIII.
(*Vide page* 19—*B.*)

λ	25 10 39·79
L	67 48 11·30
H	824
h	3

No. 139

Kusálkot Hill Mark.
(*Umarkot*)

λ	25 6 26·91
L	70 41 0·08

No. 234

Kúsalpúrá, XIII.
(*Vide page* 7—*B.*)

λ	24 17 33·06
L	76 22 9·03
H	1441
h	8

Nos. 13, 19

Ladda h.s.
(*Umarkot*)

λ	24 34 55·88
L	69 20 51·04

Nos. 255, 256

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

Lagárí Hill Mark.
(*Jharrak*)

	° ′ ″
λ	25 0 38·41
L	68 2 3·73

Nos. 278, 279

Lakar Hill Mark.
(*Umarkot*)

λ	24 43 23·80
L	70 34 49·46

Lakarwas, XXXII.
(*Vide page 9—B.*)

λ	24 31 47·99
L	73 52 10·41
H	2574
h	3

No. 40

Lakarwás Hill Temple.
(*Udaipúr*)

λ	24 34 22·9
L	73 52 5·2

No. 203

Lakora Temple.
(*Udaipúr*)

λ	25 10 16·2
L	74 19 56·7

No. 197

Lálchia s.
(*Tonk*)

λ	24 5 42·8
L	77 32 17·4

Láljí Hill Mark.
(*Jodhpúr*)

λ	24 56 36·40
L	71 26 41·06

Nos. 227, 228

Losalli, I.
(*Vide page 5—B.*)

λ	24 6 19·17
L	77 35 41·29
H	1749
h	15

No. 1

Lúnki, LXXI.
(*Vide page 14—B.*)

λ	24 58 23·16
L	70 42 9·50
H	588
h	3

Nos. 90, 91

Mairáb-ká-Shahar, LXXXV.
(*Vide page 16—B.*)

λ	24 50 10·79
L	69 22 52·74
H	44
h	20

No. 106

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

Majaurí Temple,
(*Udaipúr*) White.

	° ′ ″
λ	24 46 0·3
L	73 33 8·4

No. 215

Maklí Tomb,
(*Jharrak*) Largest.

λ	24 45 11·8
L	67 56 27·2

No. 289

Makundkherí Hill Tree.
(*Tonk*)

λ	24 35 52·8
L	77 3 18·9

Mál Niver, XXXVI.
(*Vide page 10—B.*)

λ	24 59 21·99
L	73 38 56·93
H	3876
h	3

No. 48

Manja Temple.
(*Udaipúr*)

λ	24 59 18·5
L	73 51 33·0

No. 207

Manjákar, LXXXIV.
(*Vide page 16—B.*)

λ	25 6 57·72
L	69 30 24·20
H	46
h	20

No. 109

Manwábhán Peak.
(*Bhopál*)

λ	23 16 58
L	77 24 22

Nos. 322, 323

Márd, XL.
(*Vide page 10—B.*)

λ	24 24 9·27
L	72 59 48·01
H	3080
h	4

No. 51

Marwar, XXXV.
(*Vide page 10—B.*)

λ	24 26 19·52
L	73 35 12·62
H	3433
h	3

No. 45

Masrúrí Hill Temple.
(*Kotah*)

λ	24 16 52·5
L	75 52 42·9

Nos. 177, 178

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

Mátá-ká-húrá, IX.
Vide page 6—B.)

	° ′ ″
λ	24 14 10·67
L	76 39 16·38
H	1645
h	4

No. 11

Mata-Pír-kí-Dongrí h.s.
(*Kotah*) A small circular platform of mud about a foot high, built on hill so called, and used as a referring mark for azimuth observations at Gurária.

λ	24 26 38·80
L	76 10 43·74

No. 179

Megnáth Hill Mark.
(*Tonk*)

λ	24 33 10·22
L	77 1 14·59

No. 162

Mendki, XXVI.
(*Vide page 8—B.*)

λ	24 38 15·67
L	74 55 39·78
H	1951
h	7

Nos. 33, 34

Mendki s.
(*Nímach*)

λ	24 38 43·12
L	74 54 57·32

Milkam Hill Mark.
(*Umarkot*)

λ	25 10 27·18
L	70 13 34·86

No. 247

Mír Abdul Mosque.
(*Muhammad Khán's Tánda*)

λ	24 38 56·3
L	69 14 55·6

No. 259

Mitaulí Hill Staff.
(*Udaipúr*) On northern extremity of Debhur lake.

λ	24 17 53·1
L	74 3 3·3

Modia h.s.
(*Udaipúr*) Arni village.

λ	25 4 35·13
L	74 20 59·56

Nos. 189, 190

Molásan Dome No. 1.
(*Muhammad Khán's Tánda*)

λ	24 44 52·4
L	68 32 19·7

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

Molásan Dome No. 2.
(*Muhammad Khán's Tánda*)

	° ′ ″
λ	24 44 53·2
L	68 32 21·3

Molásan Dome No. 3.
(*Muhammad Khán's Tánda*)

λ	24 45 2·3
L	68 32 30·4

No. 269

Mor-ka-got Dome.
(*Muhammad Khán's Tánda*)

λ	25 2 18·6
L	68 42 32·1

No. 266

Muhammad Khán's Tánda.
(*Muhammad Khán's Tánda*)

λ	25 7 34
L	68 34 24

No. 270

Múnáur Thánah.
(*Kotah*) Fort bastion.

λ	24 13 46·3
L	76 50 6·0

Murária s.
(*Tonk*)

λ	24 3 15·6
L	77 31 18·8

Nabísar Staff.
(*Umarkot*)

λ	25 4 28
L	69 41 51

Nága Sha, XCIX.
(*Vide page* 18—*B.*)

λ	25 1 1·94
L	68 36 34·36
H	88
h	37

No. 124

Nándna, VIII.
(*Vide page* 6—*B.*)

λ	24 22 23·15
L	77 1 21·84
H	1682
h	4

Nos. 8, 10

Nanka Húáro, XXII.
(*Vide page* 8—*B.*)

λ	24 31 48·39
L	75 17 0·22
H	1860
h	8

Nos. 28, 29

Naráro Tree,
(*Kotah*) In village.

λ	24 10 45
L	76 48 49

Narchar Hill Mark.
(*Umarkot*)

	° ′ ″
λ	25 5 30·29
L	70 21 39·63

No. 243

Náríthal h.s.
(*Umarkot*)

λ	25 16 19·97
L	69 55 1·57

No. 334

Nasára Hill Mark.
(*Kotah*)

λ	24 27 12·11
L	76 43 47·37

Náthdwára Fort Bastion,
(*Udaipúr*) Highest part of staircase.

λ	24 55 26·5
L	73 51 26·4

No. 205

Náthdwára Temple,
(*Udaipúr*) Flag staff.

λ	24 55 40·8
L	73 51 26·8

No. 206

Natiwás White Building,
(*Udaipúr*) Highest part.

λ	24 55 7·2
L	73 52 27·1

No. 204

Naya Kila Mark,
(*Sindhia's Territory*) In hill fort.

λ	24 3 47·85
L	77 17 52·91

No. 148

Naya Kot Staff.
(*Umarkot*)

λ	24 50 39
L	69 29 27

Nidamáni, XCIV.
(*Vide page* 17—*B.*)

λ	25 4 23·72
L	68 54 27·68
H	93
h	15

No. 121

Nímach Old Residency,
(*Nímach*) S. E. corner.

λ	24 27 38·2
L	74 54 14·8

No. 185

Nímaj Temple,
(*Sirohí*) White.

λ	24 46 4·0
L	72 28 7·5

No. 226

Nimthúr, XVIII.
(*Vide page* 7—*B.*)

	° ′ ″
λ	24 32 1·18
L	75 50 1·55
H	1659
h	9

Nos. 22, 23

Nipánio Hill Mark.
(*Rájgarh*)

λ	23 46 4·39
L	76 29 0·16

Pábú Hill Mark.
(*Umarkot*)

λ	24 32 10·60
L	69 28 42·50

No. 254

Pádria, LXXXII.
(*Vide page* 16—*B.*)

λ	24 44 8·98
L	69 32 51·07
H	302
h	3

No. 105

Pakka Kothi, LXXII.
(*Vide page* 15—*B.*)

λ	24 50 5·01
L	70 26 38·20
H	520
h	3

Nos. 93, 94

Pánbiár h.s.
(*Bhopál*) On a small rocky knoll about 1·25 miles N. W. of village so called, 0·75 mile S. of Palási village, and 31 ft. N.W. of the Bar tree at the top of the hill; thánah Darai; marked by a paká pillar 2 ft. high with mark-stones at top and bottom.

λ	23 26 7·98
L	77 5 8·72

No. 303

Pancháwa, XV.
(*Vide page* 7—*B.*)

λ	24 7 45·23
L	75 59 16·08
H	1622
h	3

Nos. 16, 20

Pangra, LXXXVIII.
(*Vide page* 17—*B.*)

λ	24 46 10·63
L	69 14 4·07
H	49
h	20

No. 112

Pansara h.s.
(*Kotah*)

λ	24 10 4·37
L	76 46 4·87

Nos. 168, 169

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

Panwárí Temple,
(*Sindhia's Territory*) In centre of village.

	° ′ ″
λ	24 20 35·7
L	77 37 15·3

No. 151

Paprail Fort,
(*Sindhia's Territory*) Bastion.

λ	24 13 10·0
L	76 43 26·6

Párdí Peak,
(*Bhopál*) Platform.

λ	23 29 0·4
L	77 27 56·0

Nos. 313, 314

Pariára Hill Mark.
(*Umarkot*)

λ	25 16 33·50
L	69 40 38·97

Pátan House,
(*Rájgarh*) Paká.

λ	23 58 28·2
L	76 46 59·2

Pátátonk h.s.
(*Umarkot*) Marked by a platform 1 ft. high.

λ	25 9 37·68
L	69 47 49·60

No. 333

Patlápání Hill Mark,
(*Kotah*) A platform 16 ft. square and 4 ft. high having a central masonry pillar with a mark-stone in its summit.

λ	24 30 44·08
L	76 43 15·08

No. 163

Pelora Hill Mark.
(*Umarkot*)

λ	24 41 51·12
L	69 34 43·34

No. 251

Pelú Hill Mark.
(*Umarkot*)

λ	24 42 54·49
L	70 43 53·02

No. 238

Pesua Hill Temple.
(*Sirohí*)

λ	24 43 24·6
L	73 0 54·6

No. 217

Píparkhera Hill Tree,
(*Dhár*) Large.

λ	23 29 27·9
L	77 22 49·0

No. 318

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

Poní Hill Temple.
(*Udaipúr*)

	° ′ ″
λ	25 5 44·5
L	74 21 21·2

No. 198

Raghunáthgarh House,
(*Rájgarh*) Paká.

λ	23 59 2·6
L	76 47 10·6

Rágogarh Building,
(*Sindhia's Territory*) Tall square building in hill fort.

λ	24 26 26·3
L	77 14 41·0

Rágogarh Hill Fort,
(*Sindhia's Territory*) Spire of temple.

λ	24 26 25·6
L	77 14 40·5

Nos. 157, 158

Ráinágarh Fort.
(*Udaipúr*)

λ	25 3 58
L	73 55 15

Ráipúr Chaukí,
(*Bhopál*) On hill.

λ	23 15 43·2
L	77 9 7·0

No. 331

Ráipúr Hill,
(*Bhopál*) Heap of stones.

λ	23 15 43·6
L	77 9 22·8

Rájgarh Palace,
(*Rájgarh*) Tower.

λ	24 0 22·6
L	76 46 37·6

No. 174

Rajúra, LVI.
(*Vide page* 13—*B.*)

λ	24 35 14·92
L	71 34 46·61
H	162
h	25

No. 70

Rakhrái h.s.
(*Haidarábád*) On southern limit of a cluster of hills called Ganja Thakkar (barren protuberance); kárdárí Saiyidpúr. Denoted by a mark-stone on top of a circular masonry platform 1 ft. high and 3 ft. in diameter.

λ	25 10 32·06
L	68 28 9·14

No. 341

Rámgarh Hill,
(*Dhár*) Highest point.

λ	23 41 5
L	77 11 12

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

Rámláo Village Centre.
(*Kotah*)

	° ′ ″
λ	24 29 10
L	76 7 50

Rámpúr, IV.
(*Vide page* 6—*B.*)

λ	24 17 49·79
L	77 28 10·14
H	1842
h	5

No. 2

Rámpúrá, XX.
(*Vide page* 8—*B.*)

λ	24 28 44·16
L	75 29 19·42
H	1920
h	7

Nos. 25, 26

Rámpura h.s.
(*Tonk*)

λ	24 2 19·00
L	77 27 48·44

Rámsar Hill Mark.
(*Umarkot*)

λ	25 15 49·74
L	70 6 30·90

No. 339

Rangáon, XII.
(*Vide page* 7—*B.*)

λ	23 54 35·44
L	76 25 33·84
H	1628
h	4

No. 18

Ratwa h.s.
(*Bhopál*) On a small conical hill 0·75 mile N. E. of village so called; thánah Islámnagar: marked by a paká pillar 2 ft. high, with a mark-stone at top and a mark engraved on rock *in situ* at bottom.

λ	23 28 35·45
L	77 27 55·86

No. 301

Rojhra, LXXV.
(*Vide page* 15—*B.*)

λ	24 57 26·28
L	70 16 45·08
H	518
h	3

No. 95

Sagoní Barkhera Hill,
(*Dhár*) Pole.

λ	23 33 20·76
L	77 27 50·97

No. 315

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

Sagrámpúr Hill,
(*Sindhia's Territory*) N. end of hill S. W. of village.

	° ′ ″
λ	23 55 44·1
L	77 19 28·4

No. 306

Sagror Hill Mark.
(*Umarkot*)

λ	24 35 30·89
L	69 42 12·14

No. 250

Sáhiji, CVII.
(*Vide page* 19—*B.*)

λ	24 51 0·90
L	67 38 26·47
H	445
h	3

No. 136

Saiyid Alí Pír Dome.
(*Jharrak*)

λ	24 46 43·4
L	67 56 42·0

Nos. 286, 287

Salaun Masjid,
(*Sindhia's Territory*) In village.

λ	24 23 28·7
L	77 33 58·9

No. 152

Salaunjí-kí-Tokrí Hill Mark.
(*Sindhia's Territory*)

λ	24 9 14·53
L	77 15 14·01

Salot, V.
(*Vide page* 6—*B.*)

λ	24 14 52·08
L	77 17 29·59
H	1834
h	3

No. 6

Sama Hill Mark.
(*Umarkot*)

λ	25 6 46·11
L	70 46 54·01

No. 235

Samáro, XLVII.
(*Vide page* 11—*B.*)

λ	24 49 8·38
L	72 16 29·94
H	1459
h	2

No. 64

Sánd, XXVIII.
(*Vide page* 9—*B.*)

λ	24 43 6·11
L	74 35 25·66
H	1910
h	3

No. 35

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

Sandohar, LXXVIII.
(*Vide page* 15—*B.*)

	° ′ ″
λ	25 3 3·89
L	70 1 22·18
H	408
h	3

No. 102

Sarái h.s.
(*Sindhia's Territory*)

λ	24 23 16·06
L	77 36 54·42

No. 144

Sarla, LVII.
(*Vide page* 13—*B.*)

λ	24 46 44·68
L	71 36 34·66
H	132
h	2

Nos. 71, 73

Sartal, XI.
(*Vide page* 7—*B.*)

λ	24 30 3·74
L	76 39 44·13
H	1437
h	4

No. 12

Sáwaji, CIX.
(*Vide page* 19—*B.*)

λ	25 13 31·47
L	67 33 5·39
H	1135
h	3

No. 140

Sehar Hill Mark.
(*Umarkot*)

λ	24 39 2·16
L	70 18 48·64

Nos. 241, 242

Shá Turel, XCIII.
(*Vide page* 17—*B.*)

λ	24 46 19·65
L	68 56 19·13
H	59
h	12

No. 118

Sháhtera Hill Mark.
(*Jharrak*)

λ	25 13 44·14
L	68 11 52·75

No. 290

Shaikh Radan h.s.
(*Jharrak*)

λ	24 49 56·60
L	68 3 20·95

Nos. 284, 285

Shaikh Radan Tomb.
(*Jharrak*)

λ	24 49 59·0
L	68 3 22·0

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

Síhor Bar Tree,
(*Bhopál*) Largest; N. of Parade Ground.

	° ′ ″
λ	23 12 34·1
L	77 8 22·6

Síhor, Ganesha's Temple,
(*Bhopál*) Large; N. W. of Síhor town.

λ	23 12 32·5
L	77 6 10·9

No. 330

Síhor, Mahádeo's Temple,
(*Bhopál*) Flag N. of Agency flag.

λ	23 12 2·3
L	77 7 11·8

No. 329

Síhor Residency,
(*Bhopál*) E. angle.

λ	23 11 54·8
L	77 7 14·1

No. 328

Singara Hill Mark.
(*Umarkot*)

λ	24 45 13·88
L	70 20 51·61

No. 240

Singpúr h.s.
(*Bhopál*) On a large table hill 1 mile N. of the small ruined and now deserted fort so called and 1 mile N. of Magarda village; thánah Devípurá. Marked by a paká pillar about 3 ft. high with mark-stones at top and bottom, the latter being engraved on rock *in situ*.

λ	23 35 31·51
L	77 14 33·33

No. 300

Sirohí Dome
(*Sirohí*) Of large temple.

λ	24 53 12·1
L	72 54 27·8

No. 221

Sitora, XLVIII.
(*Vide page* 11—*B.*)

λ	24 30 35·36
L	72° 8 32·81
H	625
h	6

No. 60

Soapdár Laggarí Mosque.
(*Umarkot*)

λ	24 36 5·9
L	69 16 45·9

No. 257

Sodáchar, LXXXIII.
(*Vide page* 16—*B.*)

λ	25 6 24·88
L	69 45 21·44
H	333
h	3

No. 108

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

Sohági, LXIII.
(*Vide page* 13—*B.*)

	° ′ ″
λ	24 48 3·43
L	71 10 4·02
H	269
h	*Not forthcoming*

No. 80

Somgarh Fort,
(*Dhár*) Platform.

λ	23 47 45·5
L	77 27 29·6

No. 307

Sonárí h.s.
(*Sindhia's Territory*)

λ	24 25 32·78
L	77 34 34·02

Nos. 145, 146

Súbrí h.s.
(*Umarkot*)

λ	25 16 21·92
L	69 45 23·78

No. 336

Sukrú Hill Mark.
(*Umarkot*)

λ	25 8 23·65
L	70 14 27·07

Súnda, XLIV.
(*Vide page* 11—*B.*)

λ	24 46 50·77
L	72 27 44·54
H	3252
h	3

Nos. 54, 57

Súnda Dome.
(*Jharrak*)

λ	24 59 12·0
L	68 11 25·8

No. 277

Súpí Kúba Hill Mark.
(*Umarkot*)

λ	25 25 58·55
L	69 34 26·84

Súrantál (III).
(*Vide page* 5—*B.*)

λ	24 14 20·42
L	77 43 11·09
H_s	1802·19
h	*Not forthcoming*

No. 1 of Great Arc Meridional Series. *Vide* Synoptical Vol. of that Series, p. 13—*A.*

Surgáma Staff,
(*Jharrak*) On hill top.

λ	25 20 57·6
L	67 57 31·8

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

Súrtonk Hill Mark.
(*Umarkot*)

	° ′ ″
λ	24 40 26·52
L	70 59 23·72

No. 230

Talái Tonk Hill,
(*Bhopál*) Heap of stones.

λ	23 27 1·4
L	77 14 17·8

Nos. 319, 320

Támpi, LX.
(*Vide page* 13—*B.*)

λ	24 52 39·08
L	71 29 37·37
H	180
h	6

No. 78

Támpí Hill Mark.
(*Umarkot*)

λ	24 41 59·46
L	70 26 45·51

No. 238

Tána, XXIX.
(*Vide page* 9—*B.*)

λ	24 43 3·93
L	74 13 44·30
H	2089
h	3

No. 38

Tánk s.
(*Sindhia's Territory*) On hill tower.

λ	24 20 6·53
L	77 33 32·62

Nos. 142, 143

Tatta Building,
(*Jharrak*) Highest, in town.

λ	24 44 47·1
L	67 57 54·6

Tatta Sarái,
(*Jharrak*) Gateway

λ	24 44 36·0
L	67 56 35·9

No. 288

Tattal Hill Mark.
(*Umarkot*)

λ	24 45 0·47
L	70 38 18·14

No. 236

Ter, XXXIV.
(*Vide page* 10—*B.*)

λ	24 47 10·58
L	73 39 20·09
H	3577
h	3

No. 44

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

Thalli, L.
(*Vide page* 12—*B.*)

	° ′ ″
λ	24 52 49·57
L	72 4 26·52
H	456
h	3

No. 66

Tiki, XXXIII.
(*Vide page* 9—*B.*)

λ	24 55 38·24
L	73 53 11·59
H	2369
h	3

Nos. 41, 43

Tikí No. 1 h.s.
(*Sindhia's Territory*)

λ	24 19 24·37
L	77 0 16·76

Tikí No. 2 h.s.
(*Kotah*)

λ	24 13 35·21
L	76 46 41·56

Nos. 172, 173

Tinsiá, III.
(*Vide page* 6—*B.*)

λ	24 6 27·97
L	77 20 57·88
H	1776
h	5

Nos. 3, 5

Tonk Hill Mark.
(*Umarkot*)

λ	25 6 5·30
L	70 33 58·84

No. 239

Tonkra h.s.
(*Tonk*)

λ	23 58 59·86
L	77 34 56·44

Tugúsar, LXX.
(*Vide page* 14—*B.*)

λ	24 49 54·91
L	70 39 20·39
H	512
h	3

No. 89

Udaipúr Fort,
(*Udaipúr*) Heliotrope.

λ	24 35 18
L	73 43 23

Udaipúr Temple,
(*Udaipúr*) On conical hill near town.

λ	24 36 46·0
L	73 43 2·7

No. 201

Name of station, district, description, co-ordinates &c.	Name of station, district, description, co-ordinates &c.	Name of station, district, description, co-ordinates &c.
Ulia h.s. (*Dhár*) On a conical hill of that name, 1 mile N. W. of Barodia, 1 mile E. of Pandri and 2 miles S. of Lakanwás; Rájgarh State. Close to the south side of the station there are some sacred stones and other objects of worship enclosed by a wall and sheltered by a few trees. Marked by a paká pillar 2½ ft. high with mark-stones at top and bottom. ° ′ ″ λ 23 44 59·87 L 77 11 41·98 No. 298 **Umarkot** s. (*Umarkot*) On bastion of fort. λ 25 21 48·36 L 69 46 30·32 No. 340	**Viráría, LXVII.** (*Vide page* 14—*B.*) ° ′ ″ λ 24 56 36·25 L 71 5 25·99 H 460 *h* 3 No. 82 **Voláva Hill Mark.** (*Pálanpúr*) λ 24 24 55·15 L 71 9 1·56 No. 229	**Waladhar, LIV.** (*Vide page* 12—*B.*) ° ′ ″ λ 24 32 7·21 L 71 48 19·95 H 290 *h* 12 No. 69 **Wanga Bázár,** (*Umarkot*) Staff. λ 24 37 12·1 L 69 17 2·3 No. 258 **Zelio, XXXVII.** (*Vide page* 10—*B.*) λ 24 34 20·39 L 73 21 42·82 H 3827 *h* 3 No. 46

September 1874.

J. B. N. HENNESSEY.