

174

925 Synoptical Vol. 33

ADDENDUM

TO

THE CUTCH COAST SERIES.



**ADDENDUM.**

## CUTCH COAST SERIES.

## INDUS DELTA COAST SECONDARY SERIES.

## INTRODUCTION.

This chain of secondary triangles extends from Karáchi to the Khori creek in Cutch, some 150 miles along the coast, and was executed at the special request of the Marine Survey Department. The work consisted of erecting beacons at convenient intervals along the coast at the mouths of the Indus and of determining their positions. The triangulation commenced at Karáchi from a secondary side of the Great Indus Series of the North-West Quadrilateral, and closed on a principal side of the Cutch Coast Series of the South-West Quadrilateral.

At the commencement of this field season, Mr. P. F. Prunty of the Burma Party was deputed to take up the work: he accordingly proceeded to Karáchi and was occupied there, from the 3rd to the 17th November, in making arrangements for boats, water-casks, wood for beacons, coolies for their erection, and food-supplies which had also to be taken, as nothing was procurable along the coast. The Port Officer at Karáchi was instructed by the Director of Indian Marine to supply a steam launch, as it was considered unsafe and hazardous to embark on this work without having a launch as an auxiliary to the country boats. The steam launch *Repulse* was accordingly placed at Mr. Prunty's disposal; she rendered great help for about two months, but unfortunately it was found necessary to replace her by the *Hazel*, a small boat, quite unfit for the rough work along the coast, and in consequence the work was very much delayed.

By the middle of February, the series had been laid out for a distance of 70 miles from Karáchi and seventeen beacons erected along the coast besides sites for thirteen more selected. As haze was beginning to set in, Mr. Prunty resolved to start the observations at once. Every arrangement for the work in advance having been made, the observations were commenced on the 18th February, but by the end of April the haze became so dense that the work had to be closed for the season.

## INDUS DELTA COAST SECONDARY SERIES.

During the season, the positions of twenty-four stations were determined besides those of seventeen beacons and of three points at Manora in the Karáchi Harbour, *viz.*, the Lighthouse, Signal Flag-staff and Red-light. In addition, thirteen beacons were erected in advance.

The detachment left Mussooree at the latter part of October and reached Karáchi on the 1st November. The necessary arrangements having been completed and the steam launch *Maud* placed at his disposal, Mr. Prunty proceeded down the coast on the 18th November. By the end of December nearly all the country between Keti Bandar and the shores of Cutch had been reconnoitred and stations selected for the series. The observations were commenced on the 12th January, and after encountering very rough weather and many difficulties through the failure of the water-supply, a junction with two of the principal stations of the Cutch Coast Series was effected by the 11th February. Several secondary stations of the former operations of that series were also visited inland, to fix the positions of the beacons along the coast.

*Season 1894-95.*

During the season, the positions of thirty-two stations were determined as well as those of the thirteen beacons erected the previous year. In addition, one of the two beacons which were washed away during the abnormal rise of the Indus in the monsoon of 1894, was re-erected on a new site at the mouth of the Khobar creek and its position determined.

The country through which the work was carried is an almost impassable one for an accurate trigonometrical series—for save for a few streams of fresh water in a stretch of about 25 miles, between Keti Bandar and the Mal river, the series runs through an inhospitable waste of salt water and mangrove swamp. In the first field season one boat was swamped and two lives were lost, and in the second a boat was wrecked, but fortunately, thanks to the timely assistance of Mr. Prunty, no lives were lost.

The health of the detachment for the greater part of both the seasons was very bad. In the first season fever attacked the men at the start, and for two months after the delta was entered, there was hardly any one fit for work. In the second season half the establishment was prostrated with fever and diarrhœa, and if the precaution had not been taken of serving out large doses of quinine every morning, there would not have been a man fit for work.

The present mouths of the Indus extend from a few miles south-west of Keti Bandar to the Mal river, some 30 miles south-east. The Hajámro river, once one of the main channels of the Indus, has dwindled down into an insignificant creek, about a mile in length. The water of this river has found a course miles away from its former bed, and has changed all the features of the country around the locality where it now wanders.

The only places of any importance along the coast between Karáchi and Cutch are Keti Bandar and Náráyansar. Keti Bandar is situated on the east bank of the Turshian or Haidari branch of the Indus, about 4 miles from the coast. It is a sea-port town of some

importance, and can boast of a municipal board, a school, a jail and a hospital, and has a population of about 1000 souls, mostly fishermen. The houses are built of mud and matting, and the town is inclosed by a *band* 8 feet high and 6 feet wide to protect it from inundations of the Indus. This precaution does not always succeed, for a few years ago the Indus overflowed the *band* and submerged the town, driving the inhabitants on to their house tops for safety. The country around is marshy; the health of the town is in consequence very bad, and during the autumn months about 50 per cent of the population are down with a very bad type of fever. Náráyansar in Cutch, where the work was brought to a close, is essentially a city of temples, all dedicated to the god Vishnu. It is situated on the eastern bank of the Khori creek, and can only be approached at high tide.

The observations were taken with a 12-inch vernier theodolite on two zeros, two faces on each zero, and two swings on each face. At several stations the theodolite was mounted on a trestle 10 feet high, so that the eye was raised 15 feet above the ground, and a fairly good command of the surrounding country obtained. Much difficulty was experienced in keeping the instrument level during the observations, on account of the violence of the wind and the soft yielding nature of the soil, and to this may chiefly be attributed the large triangular errors, in one case amounting to 27·2 seconds. The mean triangular error is about 9 seconds, obtained from values ranging between 0·3 and 27·2 seconds.

The errors generated in the series, about 150 miles in length, were + 0"·53 in latitude, — 3"·25 in longitude, — 122" in azimuth and — 0·0000434 in logarithm of side in feet; these have been dispersed by the application of angular corrections which in no case exceeded 6 seconds.

*August, 1897.*



CUTCH COAST SERIES.  
SECONDARY TRIANGULATION. TRIANGLES.

INDUS DELTA COAST SECONDARY SERIES.

Differences between the common sides of two triangles are shown by the small figures in the 5th and 12th columns between the data of the triangles, the first in order having supplied the greater value.

No of Triangle	Station	Corrected Plane Angle	Distance			No. of Triangle	Station	Corrected Plane Angle	Distance			No. of Triangle	Inch
			Log. feet	Feet	Miles				Log. feet	Feet	Miles		
580*	Bar	h.s.	44 26 23	4.6c7024	40460	585	Bhitri	0 1 "	4.424036	26548	585	Inch	
	Mohádi	"	24 2 57	4.371977	23549		Lakhi	35 1 16	4.664635	46198		12	
	Ghunáu	"	111 30 40	4.730472	53762		Lakhi	92 59 23	4.561684	36449		"	
581	Bara Pir	h.s.		4.607024	40460 <sup>4</sup>	586	Makra	49 59 2	4.355956	22696	586	"	
	Mohádi	"	19 9 39	4.258322	18127		Lakhi	66 23 58	4.433870	27156		"	
	Ghunáu	"	113 44 3	4.703777	50557		Katári	63 37 0	4.424036	26548		"	
582	Jamanvála, XXIII		48 0 25	4.603046	40091	587	Katári	57 13 32	4.347906	22280	587	"	
	Pinjor Pir, XXIV	h.s.	29 38 7	4.420071	26673		Lakhi	63 50 39	4.376291	23784		"	
	Kudi		102 21 28	4.721744	52692		Kilán	58 55 49	4.355950	22096		"	
583	Pinjor Pir, XXIV	h.s.	74 31 46	4.746675	55805	588	Lakhi	46 35 6	4.244136	17544	588	"	
	Kudi	h.s.	61 39 7	4.707225	50959		Kilán	66 7 42	4.341126	22086		"	
	Bhitri	s.	43 49 7	4.603046	40091		Pir Sunai	67 17 12	4.347906	22280		"	
584	Kudi	h.s.	35 53 4	4.561684	36449	589	Kilán	81 8 54	4.395286	24848	589	"	
	Bhitri	s.	80 17 35	4.787411	61293		Pir-Sunai	54 36 42	4.311778	20501		"	
	Makra	"	63 49 21	4.746675	55805		Daf	44 14 24	4.244136	17544		"	

\* Numbered in continuation of triangles given on page 40.—L.



No. of Triangle	Station	Corrected Plane Angle	Distance			No. of Triangle	Station	Corrected Plane Angle	Distance			Theodolite used
			Log. feet	Feet	Miles				Log. feet	Feet	Miles	
590	Dafi Pir Sunai Sirr	s. 8 " "	72 53 11	27926	5.289	602	Kudka Wári Kot Sarai	s. " "	4.46002	29116	5.514	Theodolite used
			48 51 36	22005	4.168				4.464132	29116	5.514	
			58 15 13	24848	4.706				4.183192	15247	2.888	
591	Pir Sunai Sirr Bhāta	s. " "	49 10 52	24914	4.719	608	Wári Kot Sarai Kochi	s. " "	4.395286	23895	4.526	" "
			72 47 45	31448	5.956				4.534164	34211	6.479	
			58 1 23	27926	5.289				4.353100	22548	4.270	
592	Sirr Bhāta Kājūr	s. " "	61 16 17	37851	7.169	604	Kudka Kot Sarai Kochi	s. " "	4.44002	29116	5.514	" "
			40 10 29	24914	4.719				4.534164	34211	6.479	
			40 10 29	33895	6.414				4.589038	38620	7.332	
593	Bhāta Kājūr Kājūr	s. " "	38 33 22	23641	4.477	605	Kot Sarai Kochi Wāchūr	s. " "	4.373668	36155	6.847	" "
			47 44 29	28073	5.317				4.558163	36155	6.847	
			93 42 9	37851	7.169				4.56485	36015	6.821	
594	Kājūr Kājūr Thar	s. " "	60 29 24	30952	5.862	606	Kochi Wāchūr Mal	s. " "	4.490683	39379	5.754	" "
			77 50 57	34769	6.585				4.482571	39379	5.754	
			41 39 39	23641	4.477				4.366140	23235	4.401	
595	Kājūr Thar Magrāwāla	s. " "	27 21 53	21382	4.950	607	Wāchūr Mal Pukero	s. " "	4.330046	26008	4.926	" "
			110 55 27	34350	8.229				4.451113	26008	4.926	
			41 42 40	30952	5.862				4.494856	31250	5.919	
596	Thar Magrāwāla Bughān	s. " "	55 25 59	26697	5.056	608	Mal Pukero Muthni Mouth	s. " "	4.426405	22113	5.754	" "
			83 18 14	32199	6.098				4.344648	22113	5.754	
			41 15 47	21382	4.950				4.457172	28653	5.427	
597	Thar Bughān Lāpta	s. " "	24 34 0	14274	2.703	609	Pukero Muthni Mouth Gábar Junction	s. " "	4.154554	34210	6.479	" "
			85 44 30	34239	6.485				4.534156	34210	6.479	
			69 41 30	21999	6.098				4.509643	32333	6.124	
598	Magrāwāla Bughān Lāpta	s. " "	31 12 9	14274	2.703	610	Pukero Gábar Junction Gábar	s. " "	4.154554	34210	6.479	" "
			44 28 43	19395	3.656				4.388857	21323	4.039	
			104 19 8	26697	5.056				4.485564	30589	5.793	
599	Bughān Lāpta Kaulka	s. " "	89 37 49	23258	4.405	611	Muthni Mouth Gábar Junction Gábar	s. " "	4.366568	21323	4.039	" "
			52 30 30	18454	3.495				4.328857	21323	4.039	
			4.154554	14274	2.703				4.257149	16078	3.424	
600	Lāpta Kudka Wári	s. " "	66 14 4	23895	4.526	612	Gábar Gábar Junction Cheni	s. " "	4.378315	25267	4.785	" "
			4.366568	20232	3.832				4.402553	25267	4.785	
			62 58 16	23258	4.405				4.527785	33712	6.395	
601	Lāpta Bughān Wári	s. " "	118 44 40	29847	5.653	613	Gábar Junction Cheni Vatho	s. " "	4.474901	18451	3.495	" "
			4.366568	20232	3.832				4.266031	18451	3.495	
			24 47 29	14274	2.703				4.426076	26673	5.032	

SECONDARY TRIANGULATION. TRIANGLES.

No. of Triangle	Station	Corrected Plane Angle	Distance			No. of Triangle	Station	Corrected Plane Angle	Distance			No. of Triangle	Station	Corrected Plane Angle	Distance			No. of Triangle
			Log. feet	Feet	Miles				Log. feet	Feet	Miles				Log. feet	Feet	Miles	
614	Cheni	8. 86 29 1	4 379188	23944	4 535	626	Jua	8. 88 59 57	4 280505	19077	3 613	Jua	8. 88 59 57	4 280505	19077	3 613	12	
	Yatho	" 43 14 12	4 215706	10433	3 112		Sisa	" " " "	4 214308	10380	3 102		Sisa	" " " "	4 214308	10380		3 102
	Khobar	" 4 266031	18451	3 495			Gorabio	" 31 51 11	4 002993	10069	1 907		Gorabio	" 31 51 11	4 002993	10069		1 907
615	Yatho	8. 85 49 17	4 523396	33373	6 321	627	Jua	8. 118 7 7	4 402434	25260	4 784	Jua	8. 118 7 7	4 402434	25260	4 784		
	Khobar	" 4 398947	25058	4 746			Gorabio	" 23 39 19	4 556365	36005	6 819		Gorabio	" 23 39 19	4 556365	36005	6 819	
	Chino	" 45 41 16	4 379186	23944	4 535		Khamisa	" " " "	4 214308	16380	3 102		Khamisa	" " " "	4 214308	16380	3 102	
616	Khobar	8. 57 11 47	4 401574	25210	4 775	628	Sisa	8. 86 15 56	4 402434	25260	4 784	Sisa	8. 86 15 56	4 402434	25260	4 784		
	Chino	" 47 11 47	4 461514	26943	5 482		Gorabio	" 38 24 1	4 280505	19077	5 804		Gorabio	" 38 24 1	4 280505	19077	5 804	
	Turshian	" 75 44 20	4 523396	33373	6 321		Khamisa	" " " "	4 280505	19077	3 613		Khamisa	" " " "	4 280505	19077	3 613	
617	Turshian	8. 42 41 32	4 234255	17150	3 248	629	Gorabio	8. 44 29 0	4 282010	19143	3 626	Gorabio	8. 44 29 0	4 282010	19143	3 626		
	Chino	" 42 41 22	4 234232	17149	3 248		Khamisa	" 67 54 26	4 403358	25314	4 794		Khamisa	" 67 54 26	4 403358	25314	4 794	
	Turshian	" 94 37 6	4 401574	25210	4 775		Paut Beacon	" " " "	4 402434	25260	4 784		Paut Beacon	" " " "	4 402434	25260	4 784	
618	Chino	8. 50 7 10	4 216353	16457	3 117	680	Paut Beacon	8. 54 29 45	4 203713	15935	3 027	Paut Beacon	8. 54 29 45	4 203713	15935	3 027		
	Turshian	" 76 46 53	4 319679	20878	3 954		Khamisa	" 77 8 9	4 282010	19143	3 626		Khamisa	" 77 8 9	4 282010	19143	3 626	
	Turshian	" 53 5 57	4 234255	17150	3 248		Dubbo	" " " "	4 282010	19143	3 626		Dubbo	" " " "	4 282010	19143	3 626	
619	Turshian	8. 52 45 57	4 409755	25680	4 865	681	Dubbo	8. 92 20 41	4 489648	30878	5 848	Dubbo	8. 92 20 41	4 489648	30878	5 848		
	Turshian	" 96 34 4	4 508900	32055	6 071		Khamisa	" 59 18 7	4 424444	26573	5 033		Khamisa	" 59 18 7	4 424444	26573	5 033	
	Richhal	" 30 39 59	4 210353	10457	3 117		Pitiani	" 28 21 12	4 166620	14076	2 780		Pitiani	" 28 21 12	4 166620	14076	2 780	
620	Turshian	8. 27 20 18	4 082896	12103	2 292	682	Dubbo	8. 105 39 47	4 682319	40119	9 114	Dubbo	8. 105 39 47	4 682319	40119	9 114		
	Richhal	" 75 33 33	4 406910	25222	4 834		Pitiani	" 32 7 20	4 424444	26573	5 033		Pitiani	" 32 7 20	4 424444	26573	5 033	
	Bedewari	" 77 6 9	4 409755	25689	4 865		Pir Katal	" " " "	4 424444	26573	5 033		Pir Katal	" " " "	4 424444	26573	5 033	
621	Richhal	8. 69 41 30	4 342675	22013	4 169	683	Khamisa	8. 54 20 38	4 526064	33579	6 360	Khamisa	8. 54 20 38	4 526064	33579	6 360		
	Bedewari	" 32 30 26	4 082896	12103	2 292		Pitiani	" 77 18 35	4 605484	40317	7 636		Pitiani	" 77 18 35	4 605484	40317	7 636	
	Bhuri	" 41 6 8	4 108493	12838	2 431		Pir Katal	" 48 20 47	4 489648	30878	5 848		Pir Katal	" 48 20 47	4 489648	30878	5 848	
622	Bedewari	8. 35 39 42	4 108493	12838	2 431	684	Pitiani	8. 85 56 52	4 631546	42810	8 108	Pitiani	8. 85 56 52	4 631546	42810	8 108		
	Bhuri	" 52 49 38	4 244185	17546	3 323		Pir Katal	" 51 28 52	4 526064	33579	6 360		Pir Katal	" 51 28 52	4 526064	33579	6 360	
	Katni	" 91 30 40	4 342675	22013	4 169		Khai	" " " "	4 526064	33579	6 360		Khai	" " " "	4 526064	33579	6 360	
623	Katni	8. 99 18 28	4 284904	19271	3 650	685	Pir Katal	8. 42 20 10	4 460906	28847	5 493	Pir Katal	8. 42 20 10	4 460906	28847	5 493		
	Bhuri	" 39 35 24	4 094997	12445	2 357		Khai	" 91 50 54	4 631546	42810	8 108		Khai	" 91 50 54	4 631546	42810	8 108	
	Jua	" 41 6 8	4 108493	12838	2 431		Letan	" " " "	4 631546	42810	8 108		Letan	" " " "	4 631546	42810	8 108	
624	Bhuri	8. 29 30 53	4 002993	10069	1 907	686	Khai	8. 68 37 28	4 512471	34872	6 604	Khai	8. 68 37 28	4 512471	34872	6 604		
	Jua	" 79 56 52	4 303739	20125	3 812		Letan	" 56 16 8	4 493365	31143	5 808		Letan	" 56 16 8	4 493365	31143	5 808	
	Sisa	" 4 284904	19271	3 650			Khudi Beacon	" " " "	4 487332	30715	5 817		Khudi Beacon	" " " "	4 487332	30715	5 817	
625	Bhuri	8. 69 6 17	4 293032	19635	3 719	687	Letan	8. 48 16 6	4 426119	26694	5 056	Letan	8. 48 16 6	4 426119	26694	5 056		
	Katni	" 73 14 40	4 303739	20125	3 812		Khudi Beacon	" " " "	4 464783	29158	5 522		Khudi Beacon	" " " "	4 464783	29158	5 522	
	Sisa	" 4 108493	12838	2 431			Almad Shah	" 77 7 44	4 542471	34872	6 604		Almad Shah	" 77 7 44	4 542471	34872	6 604	

No. of Triangle	Station	Corrected Plane Angle	Distance			No. of Triangle	Station	Corrected Plane Angle	Distance			No. of Triangle	Station	Corrected Plane Angle	Distance			Theodolite used	
			Log. feet	Feet	Miles				Log. feet	Feet	Miles				Log. feet	Feet	Miles		
638	Khadi Beacon	s.	4° 50' 40.23	31917	6° 04.5	650	Ber Mohádi	h.s.	51° 36' 42"	4° 69' 66.34	40732	650	Ber Mohádi	h.s.	51° 36' 42"	4° 69' 66.34	40732	Inch 12	
	Ahmad Shah	"	4° 34' 70.22	22234	4° 21.1		Sikrún Pir Beacon	"	70° 27' 56"	4° 77' 66.72	53796		Sikrún Pir Beacon	"	70° 27' 56"	4° 77' 66.72	53796		
	Jaktan	"	4° 42' 61.19	26694	5° 03.6					4° 73' 04.72	53762				4° 73' 04.72	53762			
639	Ahmad Sháh	s.	62° 25' 22"	29738	5° 63.2	651	Ber Mohádi	h.s.	76° 10' 20"	4° 77' 39.65	52962	651	Ber Mohádi	h.s.	76° 10' 20"	4° 77' 39.65	52962	Inch 12	
	Jaktan	"	4° 31' 32"	23940	4° 53.4		Maniara Beacon	"	4° 7' 8"	3° 59' 30.21	3918		Maniara Beacon	"	4° 7' 8"	3° 59' 30.21	3918		
	Walása	"	72° 3' 6"	4° 50' 40.23	31917		6° 04.5			4° 73' 04.72	53762				4° 73' 04.72	53762			
640	Jaktan	s.	86° 46' 54"	31831	6° 02.9	652	Ghunán Mohádi	h.s.	103° 59' 31"	4° 72' 39.65	52962	652	Ghunán Mohádi	h.s.	103° 59' 31"	4° 72' 39.65	52962	Inch 12	
	Walása	"	24° 20' 41"	4° 11' 86.05	13142		2° 48.0	Maniara Beacon	"	28° 10' 5"	4° 41' 10.42		23766	Maniara Beacon	"	28° 10' 5"	4° 41' 10.42		23766
	Pitai	"	68° 52' 25"	4° 47' 33.13	29738		5° 63.2			4° 60' 70.24	40460				4° 60' 70.24	40460			
641	Walása	s.	74° 19' 30"	4° 53' 00.67	35487	6° 72.1	Gugriána Dho	h.s.	34° 37' 8"	4° 41' 80.07	26182	653	Gugriána Dho	h.s.	34° 37' 8"	4° 41' 80.07	26182	Inch 12	
	Pitai	"	45° 57' 2"	4° 42' 30.99	26491	5° 01.7	Ber Mohádi	"	55° 20' 38"	4° 57' 87.49	37910		Ber Mohádi	"	55° 20' 38"	4° 57' 87.49	37910		
	Rutta Kot	"	59° 43' 28"	4° 50' 28.45	31831	6° 02.9	Gholáy Beacon	"	27° 6' 42"	4° 41' 80.07	26182		Gholáy Beacon	"	27° 6' 42"	4° 41' 80.07	26182		
642	Pitai	s.	54° 59' 5"	4° 60' 60.01	40448	7° 66.1	Mohádi	h.s.	83° 32' 8"	4° 75' 05.33	57086	654	Mohádi	h.s.	83° 32' 8"	4° 75' 05.33	57086	Inch 12	
	Ibráhim Haidar	"	79° 4' 53"	4° 68' 56.84	48494	9° 18.4	Ber Mohádi	"	27° 6' 42"	4° 41' 80.07	26182		Ber Mohádi	"	27° 6' 42"	4° 41' 80.07	26182		
	Rutta Kot	"	45° 56' 2"	4° 53' 00.67	35487	6° 72.1	Gholáy Beacon	"	37° 49' 55"	4° 51' 20.58	32513		Gholáy Beacon	"	37° 49' 55"	4° 51' 20.58	32513		
643	Rutta Kot	s.	60° 11' 32"	4° 55' 50.42	35896	6° 79.8	Jamanvía, XXIII		37° 49' 55"	4° 51' 20.58	32513	655	Jamanvía, XXIII		37° 49' 55"	4° 51' 20.58	32513	Inch 12	
	Ibráhim Haidar	"	41° 55' 0"	4° 41' 48.1	27636	5° 23.4	Pinjor Pir, XXIV		45° 53' 45"	4° 58' 05.22	35065		Pinjor Pir, XXIV		45° 53' 45"	4° 58' 05.22	35065		
	Renhi	"	77° 53' 28"	4° 60' 69.01	40448	7° 66.1	Ghunur Beacon		45° 43' 6"	4° 51' 20.58	32513		Ghunur Beacon		45° 43' 6"	4° 51' 20.58	32513		
644	Rerhi	s.	59° 26' 0"	4° 52' 94.96	33845	6° 41.0	Kudi	h.s.	16° 15' 38"	4° 104' 36.3	12710	656	Kudi	h.s.	16° 15' 38"	4° 104' 36.3	12710	Inch 12	
	Ibráhim Haidar	"	54° 36' 53"	4° 50' 57.79	32046	6° 06.9	Pinjor Pir, XXIV		45° 43' 6"	4° 51' 20.58	32513		Pinjor Pir, XXIV		45° 43' 6"	4° 51' 20.58	32513		
	Karachi Base-line S. End, (XX)	"	85° 57' 7"	4° 55' 50.42	35896	6° 79.8	Ghunur Beacon		111° 25' 20"	4° 781' 40.3	60451		Ghunur Beacon		111° 25' 20"	4° 781' 40.3	60451		
645	Ibráhim Haidar	s.	88° 37' 51"	4° 62' 06.49	41749	7° 00.7	Sakarda	h.s.	29° 23' 24"	4° 503' 35.5	31868	657	Sakarda	h.s.	29° 23' 24"	4° 503' 35.5	31868	Inch 12	
	Karachi Base-line S. End, (XX)	"	37° 13' 47"	4° 40' 53.7	23206	4° 78.5	Pinjor Pir, XXIV		111° 25' 20"	4° 781' 40.3	60451		Pinjor Pir, XXIV		111° 25' 20"	4° 781' 40.3	60451		
	Clifton	h.s.	54° 8' 22"	4° 52' 94.96	33845	6° 41.0	Bakal Beacon		91° 8' 57"	4° 781' 40.3	60451		Bakal Beacon		91° 8' 57"	4° 781' 40.3	60451		
646	Mutrání	H.S.*	3° 97' 49.70	9440	1° 78.8	658	Bhitrí	s.	31° 24' 43"	4° 498' 48.5	31513	658	Bhitrí	s.	31° 24' 43"	4° 498' 48.5	31513	Inch 12	
	Karachi Observatory	S.*	73° 46' 18"	4° 42' 06.59	26343		4° 98.9	Pinjor Pir, XXIV		95° 34' 42"	4° 781' 40.3		60451	Pinjor Pir, XXIV		95° 34' 42"	4° 781' 40.3		60451
	Clifton	h.s.*	86° 6' 11"	4° 43' 73.13	27372		5° 18.4	Bakal Beacon		43° 7' 3"	4° 618' 20.1		41515	Bakal Beacon		43° 7' 3"	4° 618' 20.1		41515
647	Ghunán Mohádi	h.s.	42° 11' 8"	4° 55' 12.48	35583	6° 73.9	Kudi	h.s.	95° 34' 42"	4° 781' 40.3	60451	659	Kudi	h.s.	95° 34' 42"	4° 781' 40.3	60451	Inch 12	
	Lún Beacon	"	88° 2' 7"	4° 73' 39.5	52957	10° 03.0	Pinjor Pir, XXIV		35° 03' 6"	4° 562' 29.4	36500		Pinjor Pir, XXIV		35° 03' 6"	4° 562' 29.4	36500		
		"	4° 60' 70.24	40460	7° 66.3		Bakal Beacon		52° 5' 56"	4° 664' 62.5	46198		Bakal Beacon		52° 5' 56"	4° 664' 62.5	46198		
648	Ber Mohádi	h.s.	26° 9' 21"	4° 55' 12.48	35583	6° 73.9	Bhitrí	s.	35° 03' 6"	4° 562' 29.4	36500	660	Bhitrí	s.	35° 03' 6"	4° 562' 29.4	36500	Inch 12	
	Lún Beacon	"	112° 5' 4"	4° 87' 38.99	74800	14° 16.7	Lakhi	"	52° 5' 56"	4° 664' 62.5	46198		Lakhi	"	52° 5' 56"	4° 664' 62.5	46198		
		"	4° 73' 04.72	53762	10° 18.2		Makra Beacon		63° 40' 12"	4° 423' 87.7	27539		Makra Beacon		63° 40' 12"	4° 423' 87.7	27539		
649	Ghunán Mohádi	h.s.	80° 16' 29"	4° 69' 66.34	49732	9° 41.9	Katári	s.	66° 17' 33"	4° 433' 14.8	27111	661	Katári	s.	66° 17' 33"	4° 433' 14.8	27111	Inch 12	
	Mohádi	"	46° 24' 59"	4° 56' 28.1	36549	6° 22.2	Lakhi	"	66° 17' 33"	4° 433' 14.8	27111		Lakhi	"	66° 17' 33"	4° 433' 14.8	27111		
	Sikrún Pir Beacon	"	4° 60' 70.24	40460	7° 66.3		Makra Beacon		4° 355' 95.6	22696			Makra Beacon		4° 355' 95.6	22696			

\* These stations appertain to the Great Indus Series of the North-West Quadrilateral.

SECONDARY TRIANGULATION. TRIANGLES.

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	
662	Sirr	8. 58 19 20	4. 395630	24867	4. 710	Inch 12	Vatho	8. 92 40 37	4. 567197	36915	6. 991	Theodolite	
	Pir Sunai	" 48 48 4	4. 342157	21987	4. 164		Chino	" 44 37 48	4. 414334	25962	4. 917		
	Daf Beacon	" 4 440002	27920	5. 289	"		Khoar Beacon	" 4. 398947	25058	4. 746			
663	Kilán	8. 81 8 8	4. 395630	24867	4. 710	" "	Turshían	No. 1 8. 79 33 15	4. 567197	36915	6. 991		
	Pir Sunai	" 54 40 14	4. 312454	20533	3. 869		Chino	" 58 15 15	4. 504074	31921	6. 046		
	Daf Beacon	" 4. 244136	17544	3. 323	"		Khoar Beacon	" 4. 401574	25210	4. 775			
664	Kájur	No. 1 8. 40 21 28	4. 398365	25025	4. 739	" "	Chino	s. 92 45 41	4. 525499	33535	6. 351		
	Bháta	" 61 16 23	4. 530047	33888	6. 418		Turshían	" 48 47 18	4. 402384	25237	4. 784		
	Sirr Beacon	" 4. 578076	37851	7. 169	"		Turshían Beacon	" 4. 319679	20878	3. 954			
665	Pir Sunai	8. 49 23 53	4. 398365	25025	4. 739	" "	Kichhal	8. 45 48 22	4. 525499	33535	6. 351		
	Bháta	" 58 1 17	4. 446503	27958	5. 295		Turshían	" 100 52 43	4. 562113	45932	8. 699		
	Sirr Beacon	" 4. 497593	31448	5. 950	"		Turshían Beacon	" 4. 409755	25689	4. 865			
666	Lápta	8. 34 40 49	4. 330476	21403	4. 054	" "	Chino	s. 67 20 48	4. 626024	42269	8. 006		
	Thar	" 30 51 27	4. 285402	19293	3. 654		Turshían	" 85 32 10	4. 659573	45664	8. 648		
	Magrawáa Beacon	" 4. 534519	34239	6. 485	"		Hajjuro Beacon	" 4. 319679	20878	3. 954			
667	Kájur	No. 1 8. 27 22 48	4. 330476	21403	4. 054	" "	Richhal	s. 79 12 45	4. 626024	42269	8. 006		
	Thar	" 110 55 59	4. 638168	43468	8. 233		Turshían	" 64 7 51	4. 587910	37188	7. 333		
	Magrawáa Beacon	" 4. 490683	30952	5. 862	"		Hajjuro Beacon	" 4. 409755	25689	4. 865			
668	Kot Sarai	8. 61 52 45	4. 557821	36126	6. 842	" "	Bedewári	8. 35 35 43	4. 107242	12801	2. 424		
	Wáchur	" 56 34 10	4. 533820	34184	6. 474		Katni	" 91 28 55	4. 342133	21955	4. 164		
	Kochi Beacon	" 4. 550485	36015	6. 821	"		Bhuri Beacon	" 4. 244185	17546	3. 323			
669	Mal	8. 83 35 40	4. 557821	36126	6. 842	" "	Jua	s. 41 1 2	4. 107242	12801	2. 424		
	Wáchur	" 39 43 15	4. 366074	23231	4. 400		Katni	" 99 20 13	4. 284357	19247	3. 645		
	Kochi Beacon	" 4. 482571	30379	5. 754	"		Bhuri Beacon	" 4. 094997	12445	2. 357			
670	Wáchur	8. 49 56 1	4. 415230	26015	4. 927	" "	Jua	s. 46 33 7	4. 146289	14005	2. 652		
	Pukero	" 63 14 33	4. 482211	30354	5. 749		Bhuri	" 46 3 14	4. 142682	13889	2. 931		
	Mal Beacon	" 4. 494856	31250	5. 919	"		Sisa Beacon	" 4. 284904	19271	3. 050			
671	Muthni Mouth	8. 59 58 19	4. 415230	26015	4. 927	" "	Katni	s. 49 51 53	4. 146289	14005	2. 652		
	Pukero	" 72 38 37	4. 457383	28600	5. 432		Bhuri	" 85 38 38	4. 261641	18266	3. 459		
	Mal Beacon	" 4. 344648	22113	4. 188	"		Sisa Beacon	" 4. 108493	12838	2. 431			
672	Muthni Mouth	8. 32 39 47	4. 329150	21338	4. 041	" "	Pir Kantal	s. 32 6 27	4. 424488	26576	5. 033		
	Gábar Junction	" 27 15 6	4. 257769	18104	3. 429		Pitiani	" 105 42 17	4. 682455	48154	9. 116		
	Gábar Beacon	" 4. 534156	34210	6. 479	"		Dubbo Beacon	" 4. 526064	33579	6. 360			
673	Cheni	8. 39 15 34	4. 329150	21338	4. 041	" "	Khamisa	s. 59 18 56	4. 424488	26576	5. 033		
	Gábar Junction	" 92 12 19	4. 527539	33693	6. 381		Pitiani	" 28 43 42	4. 67188	14696	2. 783		
	Gábar Beacon	" 4. 403553	25267	4. 785	"		Dubbo Beacon	" 4. 489648	30878	5. 648			

No. of Triangle	Station	Corrected Plane Angle		Distance		Theodolite used	No. of Triangle	Station	Corrected Plane Angle		Distance		Theodolite used
		°	'	Log. feet	Feet				Log. feet	Feet	°	'	
686	Pitiani	s.	101 7 29	4 532012	34042	Inch	696	Ibrahim Haidar	s.	96 13 56	4 559120	36234	Inch
	Pir Katal	"	3 26 25	4 318460	2082	12		Rerhi	"	3 46 15	3 379695	2397	6.863
	Pitiani Beacon	"		4 520664	33579	"		Ibrahim Haidar Beacon	"	4 555042	35896	0.454	"
687	Khai	s.	51 57 12	4 532012	34042	"	697	Rutta Kot	s.	63 2 48	4 559120	36234	"
	Pir Katal	"	46 0 41	4 492774	31101	6.447		Rerhi	"	74 7 13	4 592101	39099	6.863
	Pitiani Beacon	"		4 631546	42810	5.890		Ibrahim Haidar Beacon	"	4 441481	27636	7.405	
688	Letan	s.	91 49 42	4 631570	42812	8.108	698	Karachi Observatory	S.*	43 33 59	3 815696	6542	"
	Pir Katal	"	45 50 16	4 487534	39728	5.820		Clifton	h.s.*	52 31 22	3 877019	7534	1.239
	Khai Beacon	"		4 460096	28847	5.463		Clifton Beacon	"	3 974970	9440	1.427	
689	Khai	s.	97 54 41	4 631570	42812	8.108	699	Karachi Observatory	S.*	33 49 8	3 970936	9353	"
	Pir Katal	"	0 1 20	1 224388	17	0.003		Clifton	h.s.*	0 21 32	2 022232	105	0.020
	Khai Beacon	"		4 631546	42810	8.108		Bath Island Beacon	"	3 974970	9440	1.788	
690	Pitiani	s.	85 58 18	4 631570	42812	8.108	700	Karachi Observatory	S.*	102 58 23	4 206127	19775	"
	Pir Katal	"	42 32 56	4 462731	29022	5.497		Clifton	h.s.*	49 18 20	4 187138	15386	3.745
	Khai Beacon	"		4 526064	33579	6.360		Ranjharoka Beacon	"	3 974970	9440	2.914	
691	Pitai	s.	79 26 18	4 139047	13774	2.609	701	Pitai	s.	36 4 10	4 665184	48438	"
	Jaktan	"	30 50 43	3 856350	7184	1.361		Ibrahim Haidar	"	107 48 47	4 893906	78326	1.427
	Jaktan Beacon	"		4 118665	13142	2.439		Manora Light-house	"	4 685684	48494	1.884	
692	Ibrahim Haidar	s.	46 9 52	4 549117	35409	6.706	702	Karachi Base-line S. End, (XX)*	s.	42 15 15	4 665184	48438	"
	Rutta Kot	"	78 21 0	4 681943	48078	9.106		Ibrahim Haidar	"	109 43 18	4 831290	67809	12.843
	Pitai Beacon	"		4 606901	40448	7.661		Manora Light-house	"	4 529496	33845	6.410	
693	Walasa	s.	73 39 39	4 549117	35409	6.706	703	Clifton	h.s.*	138 49 25	4 685184	48438	"
	Rutta Kot	"	60 27 21	4 506528	32102	6.086		Ibrahim Haidar	s.	21 5 27	4 422826	26474	0.174
	Pitai Beacon	"		4 423099	26491	5.017		Manora Light-house	"	4 402537	25266	5.014	
694	Ibrahim Haidar	s.	63 38 13	4 570998	37239	7.053	704	Karachi Observatory	S.*	106 3 38	4 423744	26530	"
	Rutta Kot	"	39 39 12	4 423068	26522	5.023		Clifton	h.s.*	53 56 42	4 348688	22320	5.025
	Kinjhar Beacon	"		4 606901	40448	7.661		Manora Red-light	"	3 974970	9440	4.227	
695	Pitai	s.	74 7 57	4 570998	37239	7.053	705	Clifton	h.s.*	138 38 2	4 687416	48687	"
	Rutta Kot	"	39 25 41	4 300718	24588	4.657		Ibrahim Haidar	s.	21 18 33	4 427686	26772	5.071
	Kinjhar Beacon	"		4 550667	33487	6.721		Manora Flag-staff	"	4 402537	25266	4.785	

\* These stations appertain to the Great Indus Series of the North-West Quadrilateral.

NOTE.—Before adjustment the difference between the values of the side common to triangles Nos. 688 and 690 was 10 feet; and that between triangles Nos. 701 and 703, 15 feet.

September, 1897.

H. W. PEYCHERS,

In charge Computing Office.

## CUTCH COAST SERIES.

AZIMUTHS OF SURROUNDING STATIONS AND POINTS AT PRINCIPAL  
AND SECONDARY STATIONS.

## INDUS DELTA COAST SECONDARY SERIES.

The following table contains, in the first column, the name of each Principal or Secondary Station, at which azimuths of surrounding Points have been measured; immediately followed by those azimuths. The second column contains the number of the triangle which gives the distance between the Station and the Point.

Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance	Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance
<b>Ahmad Sháh s.</b> Khúdi Beacon                    0 ' " 60 15 38 Jaktan                            s. 103 43 3 Walúsa                            " 166 8 25 Letan                                " 343 7 54	637 638 639 637	<b>Ber h.s.</b> Lún Beacon                        0 ' " 10 25 8 Ghunáu                            h.s. 28 42 10 Sikrán Pir Beacon                35 52 29 Ghoháy Beacon                    67 47 55 Maniára Beacon                    268 5 27	648 580 650 653 651
<b>Baghán s.</b> Lápta                              s. 39 29 29 Wári                                " 75 57 20 Kudka                              " 129 7 18 Thar                                " 313 44 59 Magráwála                        " 355 0 46	597 601 599 596 596	<b>Bhúta s.</b> Sirr Beacon                        s. 31 48 14 Sirr                                s. 31 48 20 Kájur                              No. 1 " 93 4 37 Kájur                              No. 2 " 131 37 59 Pir Sunai                            " 333 46 57	664 591 592 593 591
<b>Bara Pir h.s.</b> Ghunáu                            h.s. 253 54 51	581		
<b>Bedewári s.</b> Richhal                            s. 49 40 33 Bhuri                                " 119 22 3 Bhuri Beacon                    " 119 26 2 Katni                                " 155 1 45 Turshán                            No. 3 " 332 34 24	620 621 680 622 620	<b>Bhitri s.</b> Makra                              s. 30 5 43 Makra Beacon                    " 30 6 23 Lakhi                                " 65 6 59 Pinjor Pir, XXIV                " 265 59 1 Kudi                                h.s. 309 48 8 Bakal Beacon                    357 7 58	584 660 585 583 583 658

Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance	Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance
<b>Bhuri s.</b>		<b>Gábar Junction s.</b>	
Sisa Beacon	c 160 52 22	Cheni	s. 84 13 19
Sisa	s. 177 24 43	Vatho	" 125 43 41
Jua	" 206 55 36	Pukero	" 286 4 35
Katni	" 246 31 0	Muthni Mouth	" 324 45 54
Bedewári	" 299 20 38	Gábar	" 351 54 50
Richhal	" 331 51 4	Gábar Beacon	" 352 1 0
<b>Cheni s.</b>		<b>Ghunáu h.s.</b>	
Khobar	s. 104 22 26	Lún Beacon	" 2 23 10
Vatho	" 190 51 27	Sikrán Pir Beacon	" 40 28 31
Gábar Junction	" 264 11 29	Bara Pir	h.s. 73 56 5
Gábar	" 303 23 22	Ber	" 208 41 22
Gábar Beacon	" 303 27 3	Maniára Beacon	" 216 12 31
		Mohádi	" 320 12 2
<b>Chino s.</b>		<b>Gorábio s.</b>	
Khobar Beacon	" 4 31 48	Jua	s. 15 53 23
Khobar	s. 5 35 16	Sisa	" 47 44 34
Turshíán	No. 1 " 62 47 3	Paut Beacon	" 89 31 30
Turshíán Beacon	" 62 49 54	Khamisa	" 134 0 30
Hajámro Beacon	" 88 14 47		
Turshíán	No. 2 " 105 28 25		
Turshíán	No. 3 " 155 35 35	<b>Gugriána Dho h.s.</b>	
Vatho	" 319 54 0	Gholáy Beacon	" 337 42 56
<b>Clifton h.s.*</b>		<b>Ibráhim Haidar s.</b>	
Manora Red-light	" 61 29 26	Manora Flag-staff	" 89 7 47
Clifton Beacon	" 62 54 46	Manora Light-house	" 89 20 53
Rámjharoká Beacon	" 66 7 48	Clifton	h.s.* 110 26 20
Manora Flag-staff	" 69 2 33	Karachi Base-line S. End, (XX)*	" 199 4 11
Manora Light-house	" 69 13 56	Rerhi	s. 253 41 4
Karachi Observatory	S.* 115 26 8	Rutta Kot	" 295 36 4
Bath Island Beacon	" 115 47 40	Pitai	" 341 32 6
Mutráni	H.S.* 201 32 19	Pitai Beacon	" 341 45 56
Karachi Base-line S. End, (XX)*	" 236 16 9	Ibráhim Haidar Beacon	" 349 55 0
Ibráhim Haidar	s. 290 24 31	Kinjhar Beacon	" 359 14 17
<b>Dafi s.</b>		<b>Jaktan s.</b>	
Sirr	s. 162 50 49	Jaktan Beacon	" 120 31 34
Pir Sunai	" 235 44 0	Pitai	s. 151 22 17
Kilán	" 279 58 24	Walása	" 238 9 11
		Ahmad Sháh	" 283 40 43
		Khádi Beacon	" 339 20 47
<b>Dubbo s.</b>		<b>Jamanvála, XXIII</b>	
Pitiáni	s. 164 1 35	Kudi	h.s. 113 53 34
Pir Katal	" 206 14 28	Ghuar Beacon	" 124 4 4
Khamisa	" 256 22 16		
Paut Beacon	" 333 30 25		
		<b>Jua s.</b>	
<b>Gábar s.</b>		Bhuri Beacon	" 26 51 8
Cheni	s. 123 25 25	Bhuri	s. 26 56 14
Gábar Junction	" 171 55 3	Sisa Beacon	" 73 29 21
Pukero	" 246 35 3	Sisa	" 106 53 6
Muthni Mouth	" 292 12 21	Khamisa	" 157 39 29
		Gorábio	" 195 53 3
		Katni	" 345 50 0

\* These stations appertain to the Great Indus Series of the North-West Quadrilateral.

Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance	Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance
<b>Kájur No. 1 s.</b>	o / "	<b>Khobar s.</b>	o / "
Magráwála Beacon	120 3 39	Turshíán No. 1 s.	138 31 9
Magráwála	s. 120 4 34	Chino	" 185 35 2
Thar	" 147 26 27	Vatho	" 234 4 29
Kájur No. 2	" 225 17 24	Cheni	" 284 21 16
Bháta	" 273 1 53		
Sirr	" 313 12 22		
Sirr Beacon	313 23 21		
<b>Kájur No. 2 s.</b>	No. 1 s.	<b>Kilán s.</b>	
Kájur	s. 45 18 37	Dafi	s. 99 59 51
Thar	" 105 48 1	Dafi Beacon	100 0 37
Bháta	" 311 36 28	Pir Sunai	" 181 8 45
		Lakhi	" 247 16 27
		Katári	" 306 12 16
<b>Karachi Base-line S. End, (XX)*</b>		<b>Kochi s.</b>	
Ibráhim Haidar	s. 19 5 1	Mal	s. 108 47 57
Clifton	h.s.* 56 18 48	Wáchur	" 165 25 43
Manora Light-house	61 20 16	Kot Sarai	" 226 55 36
Berbi	s. 313 7 54	Kudka	" 249 55 52
		Wári	" 284 20 0
<b>Karachi Observatory S.*</b>		<b>Kot Sarai s.</b>	
Rámjharoka Beacon	38 23 52	Wári	s. 6 13 50
Manora Red-light	41 29 7	Kochi	" 46 57 25
Mutráni	H.S.* 221 39 10.86	Kochi Beacon	" 46 59 14
Bath Island Beacon	261 36 21	Wáchur	" 108 51 59
Clifton	h.s.* 295 25 20	Kudka	" 311 13 39
Clifton Beacon	338 58 58		
<b>Katári s.</b>		<b>Kudi h.s.</b>	
Kilán	s. 126 13 39	Makra	s. 93 58 9
Lakhi	" 183 27 11	Bakal Beacon	95 55 38
Makra	" 247 4 11	Bhitri	" 129 51 13
Makra Beacon	247 7 23	Ghuar Beacon	145 47 14
		Pinjor Pir, XXIV	191 30 20
		Jamanwála, XXIII	293 51 48
<b>Katni s.</b>		<b>Kudka s.</b>	
Bhuri Beacon	66 30 7	Wári	s. 37 45 30
Bhuri	s. 66 31 52	Kochi	" 69 58 31
Sisu Beacon	116 23 45	Kot Sarai	" 131 14 29
Sisa	" 139 46 38	Baghán	" 309 6 15
Jua	" 165 50 20	Lápta	" 346 57 50
Bedewári	" 335 1 12		
<b>Khai s.</b>		<b>Lakhi s.</b>	
Khai Beacon	18 49 11	Katári	s. 3 27 17
Khádi Beacon	169 56 52	Kilán	" 67 17 56
Letan	s. 238 34 20	Pir Sunai	" 113 53 2
Pir Katal	" 280 54 30	Bhitri	" 245 3 58
Pitiáni	" 332 23 22	Makra	" 297 3 19
Pitiáni Beacon	332 51 42	Makra Beacon	297 9 54
<b>Khamisa s.</b>		<b>Lápta s.</b>	
Paut Beacon	21 53 35	Wári	s. 100 44 9
Dubbo Beacon	76 22 31	Kudka	" 166 58 13
Dubbo	s. 76 23 20	Baghán	" 219 28 49
Pitiáni	" 135 41 27	Thar	" 289 10 19
Pir Katal	" 190 2 5	Magráwála	" 323 47 57
Gorábio	" 313 59 9	Magráwála Beacon	" 323 51 8
Jua	" 337 38 28		
Sisa	" 352 23 10		

\* These stations appertain to the Great Indus Series of the North-West Quadrilateral.



Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance	Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance
<b>Letan s.</b>		<b>Pir Katal s.</b>	
Khai Beacon	° ' "	Khamisa	s. 10 2 36
Khai	s. 58 35 6	Dubbo	" 26 16 3
Khúdi Beacon	114 52 26	Dubbo Beacon	" 26 16 56
Ahmad Sháh	" 163 8 32	Pitiáni Beacon	" 54 56 58
Pir Katal	" 326 45 24	Pitiáni	" 58 23 23
		Khai Beacon	" 100 56 19
		Khai	" 100 57 39
		Letan	" 146 46 35
<b>Magráwála s.</b>		<b>Pir Sunai s.</b>	
Lápta	s. 143 48 47	Kilán	s. 1 8 47
Bagháin	" 175 0 56	Dafi	" 55 45 29
Thar	" 258 19 10	Dafi Beacon	" 55 49 1
Kájur	No. 1 " 300 1 50	Sirr Beacon	" 104 24 4
		Sirr	" 104 37 5
		Bhátá	" 153 47 57
		Lakhi	" 293 51 35
<b>Makra s.</b>		<b>Pitai s.</b>	
Katári	s. 67 5 59	Jaktan Beacon	" 50 48 6
Lakhi	" 117 5 1	Manora Light-house	" 125 29 6
Bhitri	" 210 4 24	Kinjhar Beacon	" 142 24 24
Kudi	h.s. 273 53 45	Ibráhim Haidar	s. 161 33 16
		Rutta Kot	" 216 32 21
		Wulása	" 262 29 23
		Jaktan	" 331 21 48
<b>Mal s.</b>		<b>Pitiáni s.</b>	
Muthni Mouth	s. 90 53 15	Khai Beacon	" 152 22 58
Pukero	" 138 18 29	Khai	s. 152 24 24
Wáchur	" 205 5 59	Pir Katal	" 238 21 16
Kochi Beacon	" 288 41 39	Khamisa	" 315 39 51
Kochi	" 288 46 21	Pitiáni Beacon	" 339 28 45
		Dubbo	" 344 1 3
		Dubbo Beacon	" 344 3 33
<b>Mohádi h.s.</b>		<b>Pukero s.</b>	
Lán Beacon	52 11 45	Muthni Mouth	s. 30 51 49
Sikrán Pir Beacon	93 48 53	Gábar	" 66 37 6
Gholáy Beacon	137 10 7	Gábar Junction	" 106 6 51
Ghunau	h.s. 140 13 52	Wáchur	" 254 58 39
Maniára Beacon	168 23 57	Mal Beacon	" 318 13 12
		Mal	" 318 17 13
<b>Muthni Mouth s.</b>		<b>Rerhi s.</b>	
Gábar Beacon	112 7 33	Ibráhim Haidar Beacon	" 69 57 26
Gábar	s. 112 13 34	Ibráhim Haidar	s. 73 43 41
Gábar Junction	" 144 47 20	Karachi Base-line S. End, (XX)*	" 133 9 41
Pukero	" 210 50 59	Rutta Kot	s. 355 50 13
Mal Beacon	" 270 49 18		
Mal	" 270 51 9		
<b>Mutráni H.S.*</b>		<b>Richhal s.</b>	
Clifton	h.s.* 21 33 3	Hájámro Beacon	" 24 26 10
Karachi Observatory	S.* 41 40 33'92	Bhuri	s. 151 51 48
		Bedewári	" 229 39 52
		Turshíán	No. 3 " 305 13 25
		Turshíán	No. 2 " 335 53 24
		Turshíán Beacon	" 351 1 47
<b>Pinjor Pir, XXIV</b>			
Kudi	h.s. 11 30 55		
Ghuar Beacon	27 46 33		
Bakal Beacon	54 37 58		
Bhitri	s. 86 2 41		

\* These stations appertain to the Great Indus Series of the North-West Quadrilateral.

Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance	Name of Station with Azimuths of surrounding Points	No. of Triangle giving Distance
<b>Rutta Kot s.</b>		<b>Turshíán No. 2 s.</b>	
Pitai s. 36 33 57	641	Turshíán No. 1 s. 20 4 18	617
Pitai Beacon 37 17 50	692	Richhal " 155 54 22	619
Kinjhar Beacon 75 59 38	694	Turshíán No. 3 " 208 40 19	618
Ibráhim Haidar Beacon 112 47 34	697	Chino " 285 27 12	617
Ibráhim Haidar " 115 38 50	642		
Rerhi " 175 50 22	643	<b>Turshíán No. 3 s.</b>	
Walásá " 336 50 29	641	Turshíán Beacon 24 22 15	676
		Turshíán No. 2 s. 28 40 54	618
<b>Sakarda h.s.</b>		Hajámro Beacon 61 7 7	678
Bakal Beacon 93 47 59	657	Richhal " 125 14 58	619
		Bedewári " 152 35 16	620
		Chino " 335 34 57	618
<b>Sirr s.</b>		<b>Vatho s.</b>	
Kájur No. 1 s. 133 14 9	592	Cheni s. 10 51 42	613
Bháta " 211 47 23	591	Khobar Beacon 47 14 34	674
Pir Sunai " 284 35 8	590	Khobar " 54 5 54	614
Dafi " 342 50 21	590	Chino " 139 55 11	615
Dafi Beacon 342 54 28	662	Gábar Junction " 305 42 6	613
<b>Sisa s.</b>		<b>Wáchur s.</b>	
Khamisa s. 172 23 28	628	Mal Beacon 25 4 50	670
Gorábio " 227 43 31	626	Mal s. 25 6 55	606
Jua " 286 52 23	624	Pukero " 75 0 51	607
Katni " 319 45 41	625	Kot Sarai " 288 49 30	605
Bhuri " 357 24 38	624	Kochi Beacon 345 23 40	668
		Kochi " 345 25 3	605
<b>Thar s.</b>		<b>Walásá s.</b>	
Magráwála s. 78 20 41	595	Jaktan s. 58 11 5	639
Magráwála Beacon 78 21 13	666	Pitai " 82 31 46	610
Lápta " 109 12 40	597	Pitai Beacon 83 11 37	693
Baghán " 133 46 40	596	Rutta Kot " 156 51 16	641
Kájur No. 2 " 285 45 35	594	Ahmad Sháh " 346 7 59	639
Kájur No. 1 " 327 25 14	594		
<b>Turshíán No. 1 s.</b>		<b>Wári s.</b>	
Turshíán No. 2 s. 200 3 52	617	Kochi s. 104 21 35	603
Chino " 242 45 24	616	Kot Sarai " 186 13 36	602
Khobar " 318 29 44	616	Kudka " 217 44 26	600
Khobar Beacon 322 18 39	675	Baghán " 255 55 13	601
		Lápta " 280 42 42	600

## CUTCH COAST SERIES.

## CO-ORDINATES AND DESCRIPTIONS OF ALL STATIONS AND POINTS.

## INDUS DELTA COAST SECONDARY SERIES.

The following table gives the co-ordinates of all stations and other fixed points, arranged in alphabetical order, with their descriptions, and references to the preceding pages where the co-ordinates and descriptions of stations are given.

NOTE.—Principal stations are followed by the Roman numerals I, II, &c., and by the letters H.S. and S.; secondary stations by the letters h.s. and s. The year in which a station or point was originally fixed is usually given after its description.

For visited stations, the values of latitude and longitude are given to two places of decimals, and for the remaining points to one place.

The trigonometrical heights are given to the nearest foot, and the spirit-levelled heights to two places of decimals; the surfaces to which they refer, when forthcoming in the field books, are specified in foot-notes, otherwise they may be assumed to refer to the upper surface of the structure.

In the case of principal stations, the upper numeral gives the height of the station above mean sea-level and the lower that of the structure itself above ground level, but when protected by rectangular pillars, it is the height of the circular pillar above ground level.

The numerals in the last column indicate the triangles given on pages 93—L. to 98—L., by which the station or point has been fixed.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Ahmad Sháh s. ... ..	Karachi	44 feet N.W. of the junction of the Jharrand and Khádi creeks, and 73 feet W. of the latter. The site is inundated at high tide; taluka Mirpur Sákró. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 36 57.88	67 19 22.75	feet 9	637
Baghán s. ... ..	"	About ¼ of a mile E. of the Baghán creek, and flooded at high tide; taluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 53 26.16	67 59 4.19	2	596
Bakal Beacon ... ..	Cutch (Kachh) State	On the island of Bakal in the Khori creek, and about 5 miles from the Cutch shore: sub-division Gardo. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95. Note.—The beacon was reported in 1898 by the Political Agent, Cutch, to have fallen down.	23 36 59.9	68 26 55.5	11*	657 658 659

\* To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Bara Pir h.s. ... ..	...	<i>Vide page 58—L.</i> ... ..	° ' "	° ' "	feet	...
Bath Island Beacon ... ..	Karachi	On Bath Island, and 105½ feet E. of Karachi Observatory S.: táluka Karachi. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 49 50·4	67 4 3·4	35*	699
Bedewári s. ... ..	"	On an open plain, about ¾ of a mile N. of the Subh creek, the same distance E. of Goth Háji Nathu on the Richhal creek, and 100 yards nearly S. of Goth Umar Jat Dabai: táluka Ghorábári. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 11 42·01	67 26 50·51	14	620
Ber h.s. ... ..	...	<i>Vide page 58—L.</i> ... .. Note.—When visited in 1895, the station was found in good preservation.	...	...	...	...
Bháta s. ... ..	Karachi	On the S. end of a small island in the Sirr river, and flooded at high tide: táluka Shálbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 45 7·07	68 13 1·04	8	591
Bhitri s. ... ..	"	About 100 feet from the W. bank of the Khori creek, and 1 mile S S E. of the Kubba of Sháhullah Pir: táluka Jatí. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 42 11·74	68 26 38·57	8	583
Bhuri Beacon ... ..	"	On a sand mound at the mouth of the Bhuri creek, and about ½ of a mile N.W. of Goth Súnár Jat: táluka Ghorábári. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 13 29·0	67 23 23·6	17*	680 681
Bhuri s. ... ..	"	On a sand mound at the mouth of the Bhuri creek, and 37 feet W. by S. of Bhuri Beacon: táluka Ghorábári. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 13 28·93	67 23 23·24	17	621

\* To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangles
Cheni s. ... ..	Karachi	On the N. bank of the Cheni creek, and about $\frac{1}{4}$ of a mile from its junction with the Vatho river: taluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 58 39' 73"	67 32 47' 20"	feet 5	612
Chino s. ... ..	"	On the E. or left bank of the Chino or Khobar creek, and about $\frac{1}{4}$ a mile N. by E. of its junction with the Gaba creek: taluka Ghorábár. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	24 4 49' 20"	67 30 30' 57"	7	615
Clifton Beacon ... ..	"	In the compound of the Roman Catholic Mission House, and about $\frac{1}{4}$ miles W.S.W. of Clifton h.s.: taluka Karachi. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 48 40' 6"	67 4 31' 6"	82*	698
Clifton h.s.† ... ..	"	On a hill, about $\frac{1}{4}$ of a mile E. of the road from Karachi to Gizri sanitarium, and $\frac{1}{4}$ miles N.E. of Clifton: taluka Karachi. The station consists of a paka pillar of masonry, 3 feet high and 4 feet in diameter, enclosed in a platform 16 feet square. When visited in 1893-94, the station was found in good preservation and the mark-stone intact. 1893.	24 49 10' 10"	67 5 34' 85"	99	...
Dafi Beacon ... ..	"	On a sand rise on the E. bank of the Sirr river, and about 300 feet from the shore: taluka Játi. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 6 feet in the ground. 1894-95.	23 38 9' 0"	68 11 49' 3"	...	662 663
Dafi s. ... ..	"	On a sand rise on the E. bank of the Sirr river, about 300 feet from the shore, and 32 feet from Dafi Beacon: taluka Játi. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 38 8' 93"	68 11 49' 59"	18	589
Dubbo Beacon ... ..	"	On a sand mound, N. of the main entrance of the Dubbo creek, and about $\frac{1}{4}$ of a mile inland: taluka Mirpur Sávro. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 21 14' 7"	67 19 55' 1"	20*	684 685

\* To base of beacon.

† This station appertains to the Great Indus Series of the North-West Quadrilateral.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Dubbo s. ... ..	Karachi	On a sand mound, and 15·9 feet N.E. by T. of Dubbo Beacon: taluka Mirpur Sākro. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 21 14·82	67 19 55·26	feet 18	630
Gábar Beacon ... ..	"	On the E. bank of the Gábar creek, and about $\frac{1}{4}$ of a mile from the coast: taluka Sháhbandar. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1894-95.	23 55 35·6	67 37 50·2	0*	672 673
Gábar s. ... ..	"	In a swamp on the E. bank of the Gábar creek, and 41 $\frac{1}{2}$ feet from Gábar Beacon: taluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3 $\frac{1}{4}$ feet high has been built over the station. 1894-95.	23 55 35·83	67 37 50·61	0	610 611
Gábar Junction s. ... ..	"	On the E. bank of the Gábar creek, and about $\frac{1}{4}$ a mile from its junction with the Muthni river: taluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3 $\frac{1}{4}$ feet high has been built over the station. 1894-95.	23 59 5·00	67 37 18·28	3	609
Gholáy Beacon ... ..	Cutch Stato	On a hillock, about $\frac{1}{4}$ of a mile from the E. bank of the Chachla creek, 1 mile from the shore, and 2 miles N.N.W. of the village of Ghunáu: sub-division Gardo. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95. Note.—The beacon was reported in 1896 by the Political Agent, Cutch, to have fallen down.	23 26 33·7	68 34 29·8	50*	653 654
Ghuar Beacon ... ..	"	On a hillock on the E. bank of the Khorí creek, and about a mile due W. of Ghuar village: sub-division Gardo. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95.	23 38 1·8	68 33 2·7	40*	655 656
Ghunáu h.s. ... ..	"	A station of the Cutch Topographical Survey. On a rise, a few hundred yards W. of the Chukh creek, about 2 miles from the coast, and 1 mile S.S.E. of the village of Ghunáu: sub-division Gardo. When visited in 1895, the rectangular covering pillar of masonry 3 $\frac{1}{4}$ feet high was found in good preservation. 1881-82.	23 24 47·10	68 36 48·68	101	580 581

\* To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Gorábío s. ...	Karachi	On the E. bank of the Sisa creek and just above its junction with the Gorábío creek: táluca Ghorábári. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 18 55.22	67 25 46.03	feet 0	626
Gugriána Dho h.s. ...	...	<i>Fide</i> page 65—L. ... Note.—When visited in 1895, the station was found in fair preservation.	...	...	...	...
Hajámro Beacon ...	Karachi	On the shore at the entrance of the Hajámro creek: táluca Ghorábári. This beacon is about 90 feet high, and was erected by the Port Engineer, Karachi. 1893-94.	24 4 35.1	67 22 18.0	100*	678 679
Ibráhim Haidar Beacon ...	"	On a hill, about $\frac{1}{4}$ of a mile from the shore, and 1 mile W. by S. of Ibráhim Haidar village: táluca Karachi. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 47 19.4	67 9 56.4	82†	696 697
Ibráhim Haidar s. ...	"	On a very conspicuous rocky knoll, about $\frac{1}{4}$ miles W. by N. of the village of Ibráhim Haidar, and $\frac{1}{4}$ a mile N. by W. of Ibráhim Haidar Beacon: táluca Karachi. The station is denoted by a cairn 3 feet high, erected over a circle and dot engraved on the rock <i>in situ</i> . 1893-94.	24 47 42.75	67 9 51.86	92	642
Jaktan Beacon ...	"	On a sand mound at the N.W. extremity of the island of Jaktan between the Khúdi and Pitai creeks, and contiguous to the shore: táluca Mirpur Sákró. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 39 22.1	67 11 38.0	18†	691
Jaktan s. ...	"	On a shifting sand mound on the island of Jaktan, about $2\frac{1}{2}$ miles inland, and $\frac{1}{4}$ of a mile W. by S. of a Pir's tomb: táluca Mirpur Sákró. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 38 12.76	67 13 46.66	27	638
Jamanvála, XXIII ...	...	<i>Fide</i> pages 9—L. and 66—L. ... Note.—When visited in 1895, the upper mark was found intact, though the platform had fallen away.	...	...	...	...
Jun s. ...	Karachi	125 feet from the S. bank of the Jun creek, about $\frac{1}{4}$ of a mile N.W. of a small hamlet, and $\frac{1}{4}$ of a mile N.E. of Goth Káro: táluca Ghorábári. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 16 19.14	67 24 57.56	10	623

\* To top of beacon.

† To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Kájur No. 1 s. ...	Karachi	On the E. bank of the Kájur creek, and about $\frac{1}{4}$ of a mile from the shore: táluca Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3 $\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 45 27 <sup>o</sup> 05'	68 6 14 <sup>o</sup> 15'	feet 10	592
Kájur No. 2 s. ...	"	On the N. bank of the Kájur creek, and about 150 feet from the shore: táluca Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3 $\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 48 11 <sup>o</sup> 81'	68 9 15 <sup>o</sup> 08'	10	593
Karachi Base-line S. End, (XX)*	"	Just S. of the railway line and within a few yards N. of the road from Karachi to Tutta, about 2 miles E. by S. of Thúl Railway Station, and 9 miles E.N.E. of Karachi: táluca Karachi. The station is marked by a tower 22 <sup>o</sup> 9 feet high. An arched passage at the level of the ground and parallel to the base-line, runs through the tower: on this arch and in the centre of the tower is an isolated and perforated pillar rising to the level of the top of the tower. The continuation of this pillar into the basement of the tower, contains the mark-stones. These are three in number, the first being at the level of the passage-floor, the second and third 1 <sup>o</sup> 8 feet and 3 feet respectively lower down, and all in the same normal. The uppermost mark consists of a dot on silver let into a brass plug, the latter being embedded in a slab of stone. This dot was used in the measurement of the base-line. It is protected by a small dome of some 6 inches internal radius, and the entrances to the passage are closed with masonry. The upper orifice of the perforation through the tower is covered with a stone which bears a mark for ordinary reference. The entire structure is built of solid stone and lime masonry. When visited by the Levelling Party in 1894, the station was found in good preservation. The station has sunk one inch between the years 1860 and 1894. 1853.	24 52 59 <sup>o</sup> 63'	67 11 51 <sup>o</sup> 95'	46 <sup>o</sup> 29 <sup>o</sup> † 22 <sup>o</sup> 9	...
Karachi Observatory S.*	"	On Bath Island. The so-called island is an isolated hill situated about half-way between the Karachi Church and the sanitarium of Clifton. It is nearly surrounded by the sea at each high water, and at the highest spring-tides is completely so: táluca Karachi. The station consists of a solid pillar, having its upper surface flush with the ground. The pillar contains three marks, one on its upper surface and the other two 3 <sup>o</sup> 7 and 7 <sup>o</sup> 7 feet respectively below it. When visited in 1893-94, the upper mark and part of the pillar were found destroyed, and it was rebuilt from the centre mark according to the old measurements. A rectangular protecting pillar 3 $\frac{1}{2}$ feet high, with a mark-stone on the upper surface and a marble slab inscribed <u>Karachi Station</u> in its E. face, has been erected over the station. 1855.	24 49 50 <sup>o</sup> 25'	67 4 2 <sup>o</sup> 31'	35 <sup>o</sup> † 0	...
Katári s. ...	"	On the only piece of dry sand in the vicinity, on the E. bank of the Katári creek, and about 75 feet from the coast: táluca Játi. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3 $\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 35 14 <sup>o</sup> 48'	68 18 53 <sup>o</sup> 08'	9	586

\* This station appertains to the Great Indus Series of the North-West Quadrilateral.

† To dot at floor-level.

‡ As the original mark-stone at surface of pillar was not recovered, the height can no longer be considered as a spirit-levelled height; hence though the pillar was built up as nearly as possible to the original height, the value is retained as an ordinary triangulated height to the nearest foot only.



Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Katni s. ... ..	Karachi	On the N. bank of the Bhuri creek, about 257 feet E. of its junction with the Katni creek, $\frac{1}{2}$ of a mile W. of Goth Chhato Dabro, and the same distance E. of Goth Milha Vāngro, both the hamlets lying on the N. bank of the Bhuri creek: taluka Ghorūbāri. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 14 19.59	67 25 30.47	feet 9	622
Khai Beacon ... ..	"	On a sand mound, W. of the Khai creek, and about 200 yards E. of the shore: taluka Mirpur Sākro. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 29 42.7	67 16 10.5	15*	688 689 690
Khai s. ... ..	"	On a sand mound, about 200 yards inland, and 15.9 feet from Khai Beacon: taluka Mirpur Sākro. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 29 42.83	67 16 10.52	15	634
Khamisa s. ... ..	"	On a conspicuous mound which becomes an island at high tide, and about $\frac{1}{2}$ of a mile N.N.W. of the junction of the Dubbo and Khamisa creeks: taluka Mirpur Sākro. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 21 49.06	67 22 29.53	11	627 628
Khobar Beacon ... ..	"	On a sand rise on a small island at the mouth of the Khobar creek: taluka Ghorūbāri. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95.	23 58 44.6	67 29 59.1	...	674 675
Khobar s. ... ..	"	At the mouth of the Khobar creek, and about 100 feet from the shore: taluka Ghorūbāri. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 59 20.12	67 29 55.53	11	614
Khūdi Beacon ... ..	"	On a sand mound on the S. bank and near the entrance of the Khūdi creek, and within 20 yards of the shore; it is about $\frac{1}{2}$ a mile N. by W. of Shūdi Shūhā Zārat, and $\frac{1}{2}$ of a mile W. of Goth Sādik Sala on the Khūdi creek and close to its junction with the Chāngala creek: taluka Mirpur Sākro. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 34 46.6	67 15 11.6	19	630

\* To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangles
Kilán s. ... ..	Karachi	In a swamp at the head of the small creek of Kilán, and about $\frac{1}{2}$ a mile S. of the Lahlputwári canal: táluka Játi. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 37 33' 71"	68 15 26' 74"	feet 14	587
Kinjhar Beacon ... ..	"	On a sand mound on the island of Kinjhar between the sea and the Pitai creek, and about $\frac{1}{2}$ a mile E. of the shore: táluka Mirpur Sákró. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 43 20' 0"	67 9 55' 7"	15*	694 695
Kochi Beacon ... ..	"	On a sand rise on the W. bank of the Kochi creek, and about 300 feet from the shore: táluka Sháhbandar. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1894-95.	23 53 10' 0"	67 49 56' 9"	...	668 669
Kochi s. ... ..	"	On a sand rise on the W. bank of the Kochi creek, about 300 feet from the shore, and 31 feet from Kochi Beacon: táluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 53 9' 67"	67 49 56' 83"	2	603 604
Kot Sarai s. ... ..	"	On the ruins of an old fort, and 49 feet from the W. bank of the Wári creek: táluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 57 1' 09"	67 54 26' 26"	9	602
Kudi h.s. ... ..	Cutch State	A station of the Cutch Topographical Survey. On a very prominent knoll about 2 miles from the coast. It is in the lands of the village of Hamankhudi which is about a mile due E.: sub-division Gardo. When visited in 1895, the mark-stone was found intact. 1891-92.	23 36 17' 60"	68 34 19' 57"	129	582
Kudka s. ... ..	Karachi	In a swamp, and about 150 feet from the N. bank of the Kudka creek: táluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 55 21' 51"	67 56 29' 87"	1	599

\* To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Lakhi s. ... ..	Karachi	On a sand rise about 400 feet from the N. bank of the Lakhpatwari canal. The ground around is inundated at every tide: taluka Jati. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 38 58.95	68 19 7.78	feet 16	585
Lapta s. ... ..	"	In a swamp, and about 300 feet from the S. bank of the Kharuk creek: taluka Shalbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 51 37.01	67 57 26.39	...	507 598
Letan s. ... ..	"	About 45 feet from the E. bank of the Khui creek, and 111 feet from its junction with the Pukhiero creek. It is inundated at spring tide: taluka Mirpur Sakro. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 32 21.43	67 20 54.39	11	635
Lun Beacon ... ..	Cutch State	On a sand rise on the island of Lun, and about a mile E. N. E. of Lun h.s. which is on the S. edge of the island: sub-division Gardo. The beacon is made of a stout puni spar, painted black, 1 foot in diameter and 30 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95.	23 16 2.8	68 36 25.0	...	647 648
Magrawala Beacon ...	Karachi	On a sand rise, and about ¼ of a mile from the shore: taluka Shalbandar. The beacon is made of a stout puni spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95.	23 49 2.6	67 59 29.0	12*	666 667
Magrawala s. ... ..	"	On a sand rise, and about 21 feet from Magrawala Beacon: taluka Shalbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 49 2.64	67 59 29.19	12	595
Makra Beacon ... ..	"	On a sand rise, about 100 feet from the W. bank of the Khori creek, and 1 mile S. of its junction with the Lakhpatwari canal: taluka Jati. The beacon is made of a stout puni spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95.	23 36 58.8	68 23 21.7	13*	660 661

\* To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Makra s. ... ..	Karachi	On a sand rise, about 100 feet from the W. bank of the Khori creek, and 57 feet N.E. by N. of Makra Beacon: táluka Játi. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 36 59' 25"	68 23 22' 03"	feet 13	584
Mal Beacon ... ..	"	On a sand rise, about ¼ of a mile from the E. bank of the mouth of the Mal river, and ¼ a mile from the coast: táluka Sháhbandar. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1894-95.	23 54 24' 0"	67 46 0' 1"	8*	670 671
Mal s. ... ..	"	On a sand rise, and 33 feet from Mal Beacon: táluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 54 23' 80"	67 45 59' 77"	8	606
Maniára Beacon ... ..	Cutch State	On one of the S. bastions of the fort which is about ¼ of a mile W. by N. of the village of Maniára, and 500 feet N.E. by N. of Maniára Hill Fort (helio.): sub-division Gardo. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95.	23 28 13' 1"	68 39 32' 2"	254*	651 652
Manora Flag-staff ... ..	Karachi	Táluka Karachi. 1893-94. ... ..	24 47 35' 2"	67 1 3' 5"	...	705
Manora Light-house ... ..	"	Táluka Karachi. 1893-94. ... ..	24 47 37' 0"	67 1 6' 2"	164†	701 702 703
Manora Red-light ... ..	"	Táluka Karachi. 1893-94. ... ..	24 47 4' 6"	67 1 21' 9"	...	704
Mohádi h.s. ... ..	Cutch State	<i>Fide</i> page 74—L. ... .. Note.—When visited in 1895, the rectangular covering pillar of masonry 3½ feet high was found in good preservation.	...	...	...	...
Muthni Mouth s. ... ..	Karachi	On the E. bank of the Muthni river, about ¼ of a mile from its mouth, and the same distance S.S.E. of Alládu-ka-goth: táluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 54 28' 11"	67 40 51' 00"	...	608

\* To base of beacon.

† To top of roof.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Mutrání H.S.* ...	Karachi	On a peak on the low range of hills between the Karachi Observatory and the Karachi Base-line, about 1½ miles N. of the point where the railway line crosses the high road from Karachi to Kotri, and 1 mile S.E. of the high road from Karachi to Sehwan: taluka Karachi. The station consists of a solid pillar 5 feet high, having a mark-stone at the top. 1855.	24 53 12.83	67 7 19.90	$\frac{\text{feet}}{253}$ 5	...
Paut Beacon ...	"	On a sand mound, about ¼ of a mile E. of the shore, and 1½ miles S. by E. of the main entrance of the Dubbo creek: taluka Mirpur Sakro. The beacon is made of a stout puni spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 18 53.1	67 21 12.4	15	629
Pinjur Pir, XXIV ...	Cutch State	<i>Vide</i> pages 9—L. and 77—L. ... Note.—When visited in 1895, the upper mark was found intact, though the platform had fallen away.	...	...	...	...
Pir Katal s. ...	Karachi	Near an old Muhammadan cemetery known as Pir Katal, and about ¼ a mile E. of Pitáni creek. A rest-house lies about 27½ feet nearly W.: taluka Mirpur Sakro. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 28 22.38	67 23 45.58	8	632 633
Pir Sunai s. ...	"	On a mound about 20 feet in diameter and surrounded by water at the tides, about 300 feet from the N. bank of the Lakhpatwari canal, and ¼ a mile S.E. of its junction with the Sirr river: taluka Jati. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 40 27.51	68 15 30.51	8	588
Pitai Beacon ...	"	On a sand mound at the entrance and on the S. bank of the Pitai creek, and about 200 yards from the shore: taluka Mirpur Sakro. The beacon is made of a stout puni spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 40 10.3	67 12 35.0	12†	692 693
Pitai s. ...	"	On a flat-topped sand mound, about ¼ of a mile inland, 150 yards S.E. of Pitai Beacon, and 300 yards S.W. by S. of the temporary fishing village of Pitai: taluka Mirpur Sakro. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 6 inches below ground level. 1893-94.	24 40 7.03	67 12 38.39	33	610

\* This station appertains to the Great Indus Series of the North-West Quadrilateral.

† To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Pitiáni Beacon ... ..	Karachi	On a conspicuous sand mound, near the mouth of the Pitiáni creek, about $\frac{1}{2}$ a mile from the shore, and the same distance W. by S. of Goth Pitiáni on the W. bank of the same creek: táluks Mirpur Sákró. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 25 8.6	67 18 44.0	feet 10*	686 687
Pitiáni s. ... ..	"	On a sand mound, about $\frac{1}{4}$ of a mile inland, and the same distance N.N.W. of Pitiáni Beacon: táluks Mirpur Sákró. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 25 27.92	67 18 36.13	15	691
Pukero s. ... ..	"	About 250 yards from the N. bank of the Pukero creek, and 600 feet W. of Jáfir Khán's hamlet: táluks Sháh-bandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3 $\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 57 36.19	67 42 53.26	...	607
Rámjharoka Beacon ... ..	"	On the highest point of Rámjharoka island, a small one of the group known as Oyster Islands, at the entrance of the Karachi Harbour: táluks Karachi. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 47 50.8	67 2 18.6	87*	700
Rerhi s. ... ..	"	On a rocky spur, about $\frac{1}{2}$ of a mile N. by W. of the village of Rerhi on the Korangi creek, and 2 $\frac{1}{2}$ miles S.W. of the point where the N.W. Railway crosses the high road from Karachi to Kotri: táluks Karachi. The station is denoted by a cairn 3 feet high, erected over a circle and dot cut on the rock <i>in situ</i> 5 inches below ground level. 1893-94.	24 49 22.52	67 16 5.83	137	643
Richhal s. ... ..	"	22 feet from the E. bank of the Richhal creek, about a mile due W. of Phat-ka-goth, a buffalo hamlet, $\frac{1}{4}$ a mile S.W. of Goth Háji Sukha, and 1 $\frac{1}{2}$ miles E. of Goth Háji Achár, the last two hamlets lying on the E. bank of the Richhal creek: táluks Ghorábári. The station is denoted by a mark-stone embedded 3 feet below ground level. A pile of earth and stones has been erected over the station. 1893-95.	24 10 24.41	67 25 10.86	12	619
Rutta Kot s. ... ..	"	On the S.W. bastion of the ruined fort of Rutta Kot which is about a mile W. of the Cháras creek: táluks Mirpur Sákró. The station is denoted by cairn 3 feet high, erected over a mark-stone on the summit of the bastion. 1893-94.	24 44 49.45	67 16 27.60	18	641

\* To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitudo East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Sakarda h.s. ... ..	...	<i>Vide page 70—L.</i> ... .. Note.—When visited in 1895, the mark was found intact.	° ' " ...	° ' " ...	feet ...	...
Sikrân Pir Beacon ... ..	Cutch State	On a sand rise on the island of Sikrân Pir which is between the Nirâni and Khâro creeks: sub-division Gardo. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95.	23 20 11·6	68 32 34·1	44*	649 650
Sirr Beacon ... ..	Karachi	On a sand rise on the W. bank of the Sirr river, and about $\frac{1}{4}$ of a mile inland: táluka Shâhbandar. The beacon is made of a stout <i>puni</i> spar, painted black, 1 foot in diameter and 50 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 10 feet in the ground and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded 5 feet in the ground. 1894-95.	23 41 36·3	68 10 39·1	26*	664 665
Sirr s. ... ..	"	On a sand rise on the W. bank of the Sirr river, and about 111 feet from Sirr Beacon: táluka Shâhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 41 37·26	68 10 39·76	26	590
Sisa Beacon ... ..	"	On a sand mound at the entrance and on the N. bank of the Sisa creek, and about 3 miles E. of the shore: táluka Mirpur Sâkro. The beacon is made of a stout <i>puni</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 15 40·0	67 22 33·7	15*	682 683
Sisa s. ... ..	"	On a sand rise, about $3\frac{1}{2}$ miles E. of the coast, and $\frac{1}{2}$ of a mile N.N.W. of Goth Sisa on the Sisa creek: táluka Mirpur Sâkro. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 3 feet below ground level. 1893-94.	24 16 48·11	67 23 13·41	15	621 625
Thar s. ... ..	"	On a sand hillock, and about $\frac{1}{2}$ a mile N. of a branch of the Magrâwâla creek: táluka Shâhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry $3\frac{1}{2}$ feet high has been built over the station. 1894-95.	23 49 45·49	68 3 14·73	5	594

\* To base of beacon.

Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Turshíán Beacon ...	Karachi	On a sand rise, about a mile S. of the S. bank of the Turshíán river, 1½ miles in the same direction from Goth Subdár, and 200 yards from the shore: táluka Ghorábári. The beacon is made of a stout <i>pumi</i> spar, painted white, 1 foot in diameter and 47 feet long, carrying two cross arms, each at right angles, 10 feet long and 6 feet from the top. The spar has been sunk to a depth of 7 feet in concrete foundation and is held in position by four wire cable ropes, each 27 feet long, the ground ends of which have each a grappling iron attached to a log of wood embedded in a 3-foot concrete foundation. 1893-94.	24 2 54' 9"	67 26 28' 1"	feet 9*	676 677
Turshíán No. 1 s. ...	"	At the mouth of the Turshíán river, about ¼ of a mile from the shore, and 51 feet 8 inches nearly E. of Turshíán Beacon: táluka Ghorábári. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	24 2 54' 9"	67 26 28' 68"	9	616
Turshíán No. 2 s. ...	"	About 900 feet from the W. bank of the Turshíán river, and 149½ feet N.N.E. of Goth Háji Sádik: táluka Ghorábári. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	24 5 34' 50"	67 27 32' 18"	12	617
Turshíán No. 3 s. ...	"	On the right or W. bank of the Turshíán river, and 129 feet S.W. by W. of its junction with the Hajámro creek. Ketí Bandar lies on the opposite bank to E.N.E.: táluka Ghorábári. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1893-95.	24 7 57' 56"	67 28 57' 43"	9	618
Vatho s. ...	"	About 300 feet from the E. bank of the Kálandri, the old channel of the Vatho river, and ¼ of a mile S.S.E. of Sunri hamlet: táluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	24 1 39' 27"	67 33 24' 69"	11	613
Wáchur s. ...	"	On a mound, and about a mile N. of the Wáchur creek: táluka Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	23 58 56' 35"	67 48 18' 74"	6	605
Walása s. ...	"	On a sand mound on a very small island, surrounding ground lying under water at tide: táluka Mirpur Nákró. The station is denoted by a cairn 3 feet high, erected over a mark-stone buried 2½ feet below ground level. 1893-94.	24 40 48' 14"	67 18 20' 57"	11	639

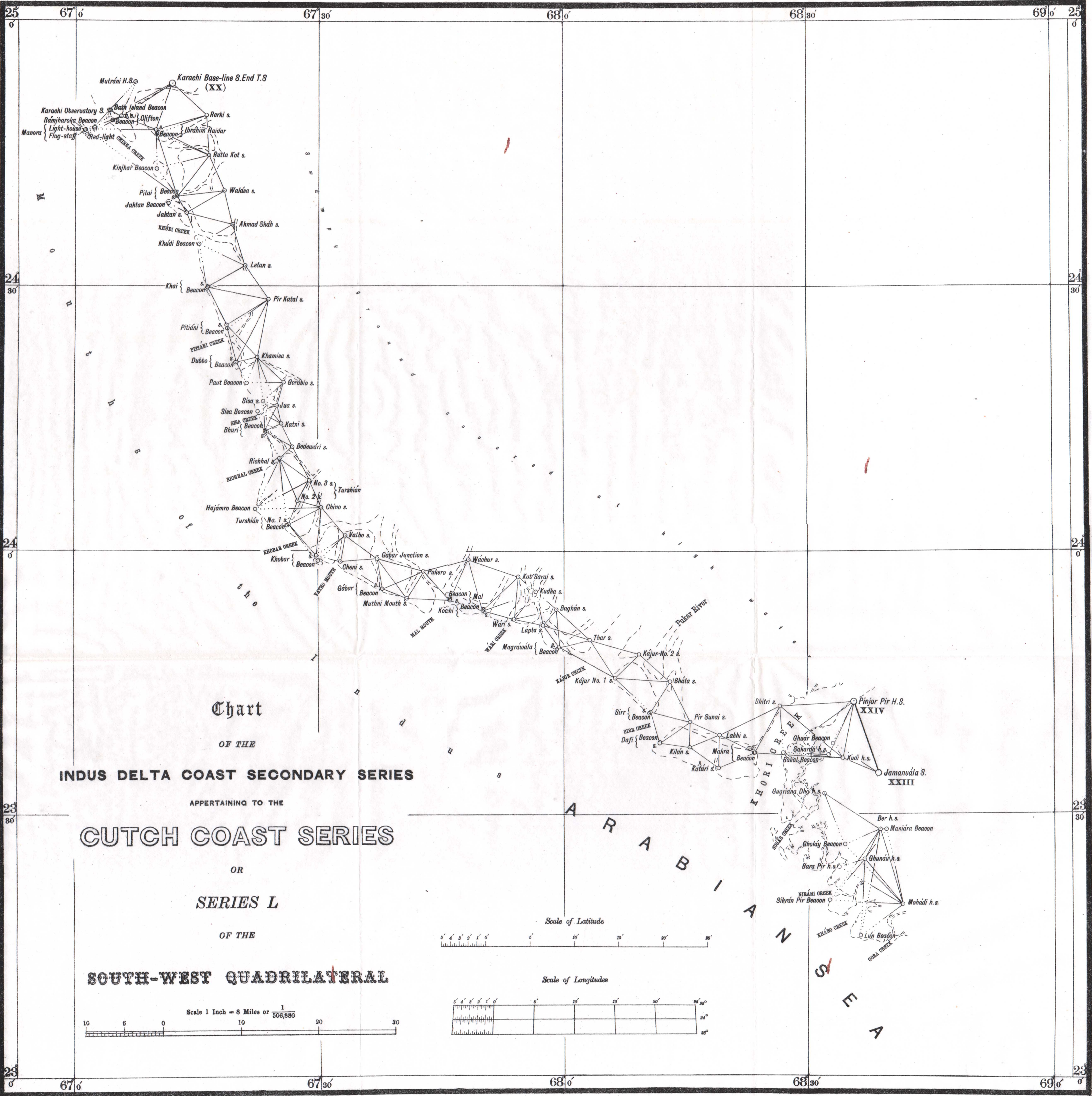
\* To base of beacon.



Name of Station or Point	District	Description	Latitude North	Longitude East of Greenwich	Height of Station — Height of Structure	No. of Triangle
Wári s. ... ..	Karachi	On the E. bank of the Wári creek, and about 95 feet from the shore: táluca Sháhbandar. The station consists of a solid pillar of masonry, 2 feet high and 3 feet in diameter, having two mark-stones, one embedded at the surface and the other 2 feet below. A rectangular covering pillar of masonry 3½ feet high has been built over the station. 1894-95.	0 1 " 23 52 14 ' 31	0 1 " 67 53 52 ' 22	feet 5	600 601

February, 1899.

J. ECCLES,  
In charge Computing Office.



List of rays omitted from want of space.

From	To
Bedewári s.	Bhuri Beacon
Bháta s.	Sirr Beacon
Bhitri s.	Makra Beacon
Cheni s.	Gábar Beacon
Chino s.	Turshíán Beacon
Clifton h.s.*	Bath Island Beacon
"	Clifton Beacon
"	Manora Flag-staff
"	Rámjharoka Beacon
Gábar Junction s.	Gábar Beacon
Ibráhim Haidar s.	Ibráhim Haidar Beacon
"	Manora Flag-staff
"	Pitai Beacon
Jua s.	Bhuri Beacon
Kájur No. 1 s.	Magráwála Beacon
Karachi Observatory S.*	Bath Island Beacon
"	Clifton Beacon
"	Rámjharoka Beacon
Katári s.	Makra Beacon
Katni s.	Bhuri Beacon
Khai s.	Khai Beacon
"	Pitai Beacon
Khamisa s.	Dubbo Beacon
Kilán s.	Dafi Beacon
Kot Sarai s.	Kochi Beacon
Lakhi s.	Makra Beacon
Lápta s.	Magráwála Beacon
Letan s.	Khai Beacon
Mal s.	Kochi Beacon
Muthni Mouth s.	Gábar Beacon
Pir Katal s.	Mal Beacon
"	Dubbo Beacon
Pir Sunai s.	Khai Beacon
"	Dafi Beacon
Pitai s.	Sirr Beacon
"	Dubbo Beacon
"	Khai Beacon
"	Pitai Beacon
Pakero s.	Mal Beacon
Rutta Kot s.	Pitai Beacon
Sirr s.	Dafi Beacon
Thar s.	Magráwála Beacon
Turshíán No. 3 s.	Turshíán Beacon
Wáchar s.	Kochi Beacon
"	Mal Beacon
Walása s.	Pitai Beacon

\* Of the Great Indus Series of the North-West Quadrilateral.

EXPLANATION OF SYMBOLS USED ON THIS CHART.

- H.S. signifies Hill Station (Principal)
- S. " Station (Principal, in the plains)
- T.S. " Tower Station (Principal)
- h.s. " Hill Station (Secondary)
- s. " Station (Secondary, in the plains)