

MEMORANDUM ON THE COMPILATION

OF

MAP OF A PORTION OF

TIBET

Explored by Captain H. H. P. Deasy, 16th Lancers,

IN

1896.

DEHRA DÚN:

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1897.

MEMORANDUM ON THE COMPILATION OF CAPTAIN DEASY'S MAP.

LATITUDES.

The Observed Latitudes have been accepted and used throughout.

LONGITUDES.

CAMP 1. Lat. $34^{\circ} 23' 23''$, long. $79^{\circ} 34' 28''$. The longitude was computed in terms of peak E. 31, (identical with G. T. Tartary No. 1 peak, *vide* Synoptical Volume VII) and from it the longitudes of S. P. 9 and S. P. 6 were computed by means of Captain Deasy's traverse to the Lanak La.

CAMP 3. Lat. $34^{\circ} 27' 3''$, long. $79^{\circ} 58' 25''$. The longitude was first computed in terms of S. P. 11, 12 and 18 which were believed to be identical with the G. T. points Mangtza Lake Nos. 3, 2 and 1, but the three resulting values were $79^{\circ} 56' 1''$, $79^{\circ} 57' 27''$, and $79^{\circ} 58' 47''$.

The Longitude of S. P. 9 was now worked out through the triangle to S. P. 9, using each of these values. That deduced, using the value from S. P. 18 agreed within $6''$ with the value of S. P. 9 brought up from camp 1, through traverse and triangulation. The value of S. P. 6 similarly worked agreed fairly well. This was taken to prove the identity of S. P. 18 with G. T. peak Mangtza Lake No. 1 and the corresponding value of camp 3 was accepted.

All the G. T. points here referred to have been fixed by only 2 rays so their G. T. values cannot be considered absolutely reliable.

CAMP 11. Lat. $34^{\circ} 35' 17''$, long. $81^{\circ} 9' 22''$. The longitude of this camp was computed through S. P. 6 which is fixed by triangles from both camp 3 and camp 11. The peak is a prominent one and Captain Deasy says there can be no doubt about its identification. The peak is, however, only fixed by a single triangle so the value is unchecked. S. P. 14 was also tried but proved to be doubtful with a difference of $2' 10''$ in latitude and $1' 33''$ in longitude.

As there was no trigonometrical connection between camp 11 and any of the subsequent camps, a fresh commencement was made at the closing end of Captain Deasy's work.

CAMP 74. Lat. $34^{\circ} 3' 43''$, long. $79^{\circ} 43' 1''$. The longitude was computed from peak E. 32, which is the same as G. T. Tartary No. 2 peak.

Then from camp 74 the value was carried through peak 256 to camp 67, but when the latitude of C. 67 thus brought up was compared with its observed latitude a difference of $1' 38''$ was found, so peak 256 was rejected and camp 74 stands by itself, there being no connection with any other camp.

CAMP 63. Lat. $33^{\circ} 59' 40''$, long. $80^{\circ} 47' 51''$. The longitude of this camp was computed by means of an azimuth taken to S. P. 6 from the camp which lay well to the south of the peak, and by the difference of latitude of the peak and the camp.

CAMP 67. Lat. $33^{\circ} 54' 53''$, long. $80^{\circ} 29' 44''$. The longitude was computed from camp 63 by azimuths and difference of latitudes through peaks 220, 232 and 28 as below:—

pk. 220	single ray from C. 67	triangle from C. 63		
„ 232	„ „	C. 63	„	C. 67
„ 28	„ „	C. 63	„	C. 67

The longitudes through peaks 220 and 28 agreed within $37''$, so their mean was accepted, the value through peak 232 being discordant was rejected.

COMPUTATION OF CAPTAIN DEASY'S HEIGHTS.

As the G. T. peaks on which Captain Deasy's longitudes have been based have not had their heights determined, it was necessary to obtain a fundamental height barometrically, on which to base the height computations.

Captain Deasy while at Leh read his Mercurial Barometer at Leh station, the height of which is known. He did not however compare his Barometer with that used at the Meteorological observatory there, the records of which for 10 A.M. and 4 P.M. daily are available. He states however that the situation of the Meteorological Instrument was within some 15 or 20 feet in height of Leh Station where he read his Barometer. I have therefore assumed the two points to be identical. The reading of Captain Deasy's Barometer in May was somewhat higher than that of the Meteorological instrument, but on his return journey the readings were almost identical.

I have worked out Captain Deasy's heights differentially with Leh, using his readings and those recorded at Leh.

The Leh records are made at 10 A.M., and 4 P.M., while Captain Deasy on account of the exigencies of marching observed at 7 A.M., and 9 P.M.

No hourly record was kept from which the hourly variation could be ascertained, so an assumed hourly correction was at first applied. As this made the results generally more discordant, and as clearly the changing weather was the greatest element in the irregularities, I finally compared the mean of the readings at each place with the similar mean at Leh.

To determine the fundamental height the procedure has been as follows:—

(1) The heights of all base camps were computed Barometrically, differentially from Leh.

(2) With the Barometrical value of camp 3 as an initial value the heights of camps 63, 67, 61, 57, 58 and 51 were computed through the triangulation. The heights thus determined in terms of camp 3 were compared with the Barometric heights of these camps and the latter were found lower than the former by various amounts, the average of which was 60 feet. This amount was therefore applied as a correction to the trigonometrical heights. In other words the fundamental height is obtained by taking the mean barometric height of 7 stations the differences of height of which had been obtained trigonometrically.

The heights were then extended as far as possible trigonometrically, the co-efficient of refraction being taken as .06.

Such camps as were not connected by triangulation have had their heights determined direct from the Barometer observations.

The Barometric observations when computed gave as a rule the usual discrepancies *inter se* of from 30 to 60 feet.

DEHRA DÚN, }
16th September, 1897. }

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Latitudes, Longitudes, Heights and Magnetic Declination at Captain Deasy's Camps.

No. of Camp	Date	Latitude by N. Star			Latitude by S. Star			Mean Latitude N.			Longitude E.			Height above Sea Level <i>feet</i>	Magnetic Declination E.	
		°	'	"	°	'	"	°	'	"	°	'	"		°	'
	1896															
Camp 1	16 June	34	23	19	34	23	26	34	23	23	79	34	28	17450	3	50
" 2	18 "		26	55		...			26	55		...		17500		...
" 3	19 "		26	58		27	7		27	3	79	58	25	17070	3	47
" 4	21 "		31	37		31	42		31	40		...		16690	3	55
" 5	22 "		33	17		33	15		33	16	80	17	6	16580	3	52
" 6	...		...			...			...			...		16950		...
" 7	25 "		34	24		34	6		34	15		...		16870	3	50
" 8	26 "		39	16		38	59		39	8	80	48	16	16990	3	48
" 9	27 "		38	47		38	54		38	51		...		17120	3	48
" 10	28 "		46	6		45	55		46	1		...		16430	3	23
" 11	30 "		35	19		35	15		35	17	81	9	22	17010		...
" 12	5 July		41	39		41	41		41	40		...		16950	3	50
" 13	6 "		48	22		48	27		48	25		...		16570	3	40
" 14	...		...			...			...			...		16040		...
" 15	10 "		53	43		53	54		53	49	81	41	54	16190	3	52
" 16	18 "		54	55		54	59		54	57		...		16370	3	47
" 17	19 "		55	29		55	47		55	38		...		16280	3	49
" 18	20 "		52	36		...			52	36		...		16450	3	47
" 19	21 "		50	34		...			50	34	82	15	30	16690	3	45
" 20	...		...			...			...			...		17190		...
" 21	Same as Camp 19		...			...			...			...		...		...
" 22	25 July		43	16		43	3		43	10	82	11	45	17310	3	45
" 23	27 "		38	6		38	8		38	7		...		17000	3	41
" 24	...		...			...			...			...		16710		...
" 25	30 "		...			22	7		22	7		...		16120		...
" 26	31 "		19	22		19	13		19	18		...		16070	3	33
" 27	2 August		9	2		9	0		9	1	82	15	23	16680	3	38
" 28	3 "		2	36		2	31		2	34	82	17	29	16630	3	32
" 29	4 "	33	54	13		...		33	54	13	82	24	3	16210	3	37
" 30	5 "		48	8	33	48	12		48	10		...		16850	3	29
" 31	7 "		45	14		...			45	14	82	36	32	16750	3	24
" 32	20 "		38	57		39	2		39	0	82	43	14	16790	3	32
" 33	21 "		33	40		33	42		33	41		...		16880	3	22
" 34	23 "		26	36		26	48		26	42	82	49	4	15970	3	29
" 35	25 "		17	31		17	22		17	27		...		15570	3	18
" 36	28 "		8	45		8	46		8	46		...		15170	3	22
" 37	30 "	32	59	54		0	5		0	0	82	50	19	15030	3	29
" 38	31 "		54	11	32	54	5	32	54	8		...		14790	3	24
" 39	1 Sept.		47	7		46	48		46	58		...		14600	3	18
" 40	3 "		41	21		41	13		41	17		...		14920	3	13
" 41	4 "		34	47		34	43		34	45	82	41	34	14420	3	14
" 42	6 "		32	32		32	38		32	35		...		14330	2	58
" 43	9 "		32	25		32	39		32	32	82	24	26	14390	3	4
" 44	10 "		32	46		33	5		32	56		...		14260	3	7
" 45	11 "		36	11		36	10		36	11		...		14240	3	10
" 46	15 "		45	24		...			45	24		...		16040	3	11
" 47	16 "		48	18		48	20		48	19		...		15910		...
" 48	17 "		56	16		56	10		56	13		...		14390	3	5
" 49	18 "	33	3	40	33	3	42	33	3	41	82	1	25	14600	3	25
" 50	19 "		9	48		9	42		9	45		...		14510	3	19
" 51	21 "		16	27		16	34		16	31	81	55	25	16630	3	23
" 52	23 "		22	11		22	19		22	15		...		15420	3	20
" 53	24 "		29	8		29	20		29	14		...		16150	3	35
" 54	25 "		34	22		34	26		34	24		...		16950	3	29
" 55	26 "		40	51		40	54		40	53		...		17140	3	24

Latitudes, Longitudes, Heights and Magnetic Declination at Captain Deasy's Camps—(Continued).

No. of Camp		Date	Latitude by N. Star			Latitude by S. Star			Mean Latitude N.			Longitude E.			Height above Sea Level	Magnetic Declination E.	
		1896	°	'	"	°	'	"	°	'	"	°	'	"	<i>feet</i>	°	'
Camp	56	27 Sept.	33	44	35	33	44	36	33	44	36	...	...	...	16360	3	23
"	57	28 "		47	35		47	35		47	35	81	32	28	16370	3	27
"	58	1 Oct.		48	44		48	49		48	47	81	29	35	16190	3	26
"	59	2 "		55	26		...	...		55	26	...	...	...	15690	3	32
"	60	...		...	...		...	...		...	...	...	...	...	16360	...	...
"	61	5 "		53	38		53	36		53	37	81	7	8	15610	3	32
"	62	6 "		53	10		53	2		53	6	...	...	...	14860	3	31
"	63	9 "		59	35		59	45		59	40	80	47	51	14850	3	31
"	64	10 "		55	4		55	12		55	8	...	...	...	16200	3	30
"	65	11 "		48	2		48	13		48	8	...	...	...	16570	3	28
"	66	12 "		49	32		49	35		49	34	...	...	...	15650	3	35
"	67	13 "		54	48		54	57		54	53	80	29	44	15170	3	30
"	68	17 "		58	52		58	45		58	49	...	...	...	15390	3	28
"	69	18 "		59	58	34	0	3	34	0	1	...	...	...	15500	3	26
"	70	19 "	34	2	25		2	23		2	24	...	...	...	16340	3	34
"	71	20 "		3	25		3	17		3	21	...	...	...	16820	3	31
"	72	21 "		2	45		2	42		2	44	...	...	...	17430	3	35
"	73	22 "		2	37		2	54		2	46	...	...	...	16610	3	31
"	74	23 "		3	42		3	44		3	43	79	43	1	16590	3	27

Latitudes, Longitudes and Heights of Peaks fixed from Captain Deasy's Camps.

Name of Station	Latitude N.	Longitude E.	Height above Sea Level	Name of Station	Latitude N.	Longitude E.	Height above Sea Level
	° ' "	° ' "	feet		° ' "	° ' "	feet
CAMP I.				CAMP 43.			
Peak E. 31 (G.T.)	34 18 31	79 36 28	20950	Peak 132	32 34 12	81 59 5	18120
Lanak La	23 50	79 36 50	18000	" 133	44 1	36 35	19140
CAMP 3.				" 134	42 17	50 52	16750
Peak 6	34 30 31	80 24 55	20540	" 135	54 10	31 58	18960
" 9	23 40	79 52 9	20250	CAMP 49.			
" 11	47 10	80 21 32	21350	Peak 136	32 43 6	82 8 4	17840
" 12	45 7	23 19	20960	" 137	40 55	14 56	17500
" 13	47 0	40 57	20470	" 140	45 21	4 10	18430
" 14 ²	53 42	81 0 1	20270	" 141	33 7 38	81 49 17	16870
" 15	44 6	80 40 6	19380	" 144	35 49	52 38	20550
" 18 (G.T.)	26 53	17 21	20150	CAMP 51.			
" 19	24 22	20 59	19990	Peak 142	33 26 56	81 39 19	21020
" 20	22 36	17 45	20500	" 159	25 45	46 55	19830
" 22	21 25	2 57	20610	" 163	46 38	82 17 59	20820
" 25	22 20	79 55 17	...	" 166	22 45	5 58	19850
CAMP II.				" 168	38 52	81 44 38	19780
Peak 33	34 31 19	81 11 21	19010	" 170	32 47 58	5 32	20980
" 36	34 43	28 8	20180	CAMP 57.			
" 39	46 57	11 50	22610	Peak 70	34 19 0	81 44 38	20560
" 41	30 27	80 48 48	20620	" 184	33 48 42	41 7	19500
" 45	23 51	54 17	21120	" 185	40 37	16 49	20100
" 46	20 9	55 58	21140	" 187	43 53	11 47	19780
" 47	20 7	81 0 31	20580	" 188	44 19	9 56	19880
" 53	35 2 2	29 16	...	" 195	34 8 23	6 0	20110
" 55	34 44 32	41 14	...	" 198	24 42	29 39	20060
" 56	35 19 27	80 58 22	23490	" 201	33 43 4	33 41	19600
CAMP 22.				" 205	59 10	34 42	...
Peak 78	34 27 50	82 28 8	18850	CAMP 61.			
" 79	9 20	9 32	20980	Peak 213	33 55 42	80 40 9	18370
" 80	17 39	81 57 44	21090	CAMP 63.			
" 81	22 54	37 38	20470	Peak 212	33 48 13	81 0 24	19120
CAMP 27.				" 220	34 19 43	80 34 30	21000
Peak 87 ^a	33 51 54	82 35 42	19360	" 221	13 29	32 28	18290
CAMP 28.				CAMP 67.			
Peak 92	34 5 1	82 12 45	...	Peak 28	34 30 27	80 45 11	...
" 93	33 56 5	38 15	18930	" 235	20 53	14 16	20610
CAMP 29.				" 237	33 35 54	50 31	19360
Peak 94	33 58 45	82 16 50	20100	" 240	34 4 1	16 19	20060
" 95	48 59	37 19	...	" 241	4 56	18 53	19830
CAMP 32.				" 242	7 31	21 11	19340
Peak 89	33 40 53	82 30 5	20690	" 244	9 46	26 39	19080
" 104	33 41	38 27	19010	" 245	13 59	54 7	20890
" 105	39 55	83 13 10	19840	" 246	33 25 42	33 12	...
" 106	13 58	26 58	19180?	" 247	35 39	25 32	19230
" 107	46 27	0 18	18300	" 249	18 59	7 29	...
" 108	15 33	28 53	20120	" 250	39 59	19 55	18800
" 109	11 2	24 29	20910	" 251	37 56	4 29	19530
" 110	16 24	5 2	20480	" 256	34 5 49	79 50 45	22120
" 116	27 54	82 15 14	20970	CAMP 74.			
" 117	36 22	20 5	19910	Peak E. 32 (G.T.)	34 16 9	79 40 52	21560
CAMP 34.				" 269	14 40	38 2	21270
Peak 120	33 25 35	82 50 3	17270				
" 122	32 48 0	81 57 37	...				
" 123	33 19 45	82 33 10	16900				

NOTE.—All longitudes are in final G. T. terms and require a correction of - 2' 30" to bring them to the Greenwich terms.

DEHRA DUN, }
17th September, 1897.

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