APPENDIX A

A SHORT SUMMARY OF, AND DISCUSSION INTO, THE MERITS OF THE TRIANGULATION EXECUTED BY RAI SĀHIB RĀM SINGH AND RAI BAHĀDUR LĀL SINGH, SURVEY OF INDIA, DURING THE THREE EXPEDITIONS OF SIR AUREL STEIN, K. C. I. E., IN CHINESE TURKISTĀN

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INTRODUCTORY

The triangulation discussed below falls into nine groups, *viz.*,

(A)—On the Tāgh-dumbāsh Pāmīr, 1900-01 (Rām Singh).

(B)—In the neighbourhood of Muz-tāgh-atā and the Little Kara-kul, 1900-01 (Rām Singh).

(C)—At Tāsh-malik hill, 1900-01 (Rām Singh).

(D)—Near Tāsh-kurghān fort, 1906-08 (Rām Singh).

(E)—South and east of Khotan, 1900-01 (Rām Singh).

(F)—From Achchan to Kapa, 1906-08 (Rām Singh).

(G)—In the headwaters of the Yurung-kāsh, 1908, (Lāl Singh).

(H)—From Kapa to latitude 39° 0′, longitude 89°47,′ 1913-15 (Lāl Singh).

(I)—From Āstin-bulak to Korla, 1913-15 (Lāl Singh).

Basis of triangulation.

It must be remembered that at the time of these operations, with the exception of one or two points on the K'un-lun mountains south of Khotan, no intersected points, from which the observers could resect their position, had been rigorously fixed by the Survey of India; and that therefore the relative accuracy and value of the triangulation are dependent on the merits of Capt. Deasy's work, on which it is largely based.

On the Pāmīrs there existed a few points fixed by Colonel Wauhope during the Pāmīr Boundary Commission of 1895, but they alone were insufficient for the needs of R. S. Rām Singh at any one of his stations.

Sources of possible error

Deasy's and Wauhope's work were both connected indirectly by resection to unmarked peaks fixed by the Survey of India. Neither of these observers could be certain that he resected his own positions from the exact points observed by the Survey triangulators, and Rām Singh and Lāl Singh must have been in doubt as to the exact summits, fixed by Deasy and Wauhope, from which they resected their own stations. In many cases the peaks employed had been intersected from long distances by badly formed triangles and were themselves liable to some error.

Wauhope's work is known to have been accurate within a very few seconds, and the regular work of Deasy is also good. Nevertheless, in many cases, the stations of the latter have been fixed by observed latitudes and azimuths to distant peaks, determined previously by himself or Wauhope, and the intersection of the azimuthal ray and the latitude parallel has been very acute, thereby introducing a further error.