

## CHAPTER XXVII.

### THE MOVEMENTS OF THE KUMDAN GLACIERS COMPARED WITH THE OSCILLATIONS IN THE LAKES.

The historical records we possess about the heights to which different glaciers in the Himalayas and Kara-korums reached at different epochs are unreliable and insufficient. And in most cases they do not reach any further back in time than the memory of man. Therefore they do not permit us to decide whether the hydrographical fluctuations of the lakes belong to a category of phenomena which include the whole of the Himalaya and Tibet.

The natural remains, on the other hand, involve the whole post-glacial epoch. A map of these mountains, showing the present extensions of glaciation, and giving the situation of every old moraine would tell us that all the glaciers have retreated since the glacial or pluvial epoch. In some cases we should be told that a certain glacier some 50 or 60 years ago proceeded to a certain front moraine wall, from which it nowadays may be separated by a considerable space of ice-free ground. But all attempts to find out a periodical advance and retreat from old moraines must so far be regarded as hypothetical and uncertain, and in some cases not harmonizing with general rules in the glaciated region regarded as a whole.

There are, however, a group of glaciers, namely, the Aktash and Kumdan glaciers at the right or western side of the upper Shayok, which on account of the surrounding topography and on account of its immediate neighbourhood to the caravan road between Ladak and Eastern Turkestan, present us with an opportunity to examine the periodical movements of the glaciers, backwards and forwards.

Such an examination, of great interest and value, has been made by Dr. T. G. LONGSTAFF, from whose report I will quote the following extracts.<sup>1</sup>

The Kumdan glaciers rise in the neighbourhood of peak K<sub>32</sub> and flow at right angles into the valley of the Shayok. »During their minor cycles of advance, one or more of these glaciers have on different occasions thrust their snouts right across the course of the Shyok river, only to be stopped by the great cliffs on its

<sup>1</sup> »Glacier Exploration in the Eastern Kara-korum», *Geographical Journal*, Vol. XXXV. June 1910, p. 647 et seq.