

Captain OLIVER, who had visited the glaciers in 1908, accompanied Longstaff in August 1909, and they found the passage still closed, now by three glaciers. Their observations seem to prove that the Aktash and Chong Kumdan glaciers had advanced somewhat during the 7<sup>1</sup>/<sub>2</sub> years since my visit to the place.

The last information I have received, is a letter dated June 1911 from GULAM RASUL, which runs as follows: »All the traders and caravans from Leh to Yarkund go by the way of Murgo on the east. They also passed by the way of Murgo in 1909 and 1910, as it is impossible to travel by the way of Kumdan, the glaciers (having) closed the road.»

The above extracts from reports of different times show how difficult it is to arrive at any reliable conclusions from the material existing. Only a few of the earlier narratives are sufficiently clear to be well understood. The expressions »open» and »closed» may also give rise to misunderstandings. For in late autumn, winter and spring the way may be open, even if the Kichik Kumdan nearly touches the opposite cliffs, but closed the next summer when the narrow passage is filled with water, and in spite of the glacier not having advanced at all.

In the following list the second column chiefly shows whether the road of Kumdan was practicable or not, or, that »closed» means that travellers had to take the Murgo route. The third column contains the results at which Longstaff arrived:

---

at that spot intensified, and, in fact, there was a narrow passage left by which we were able to advance. It was, however, excessively contracted, sometimes only 10 metres across; and it was perfectly plain that it needs but a slight increase in the glacial activity, such, for example, as one or two snowy winters followed by warm, bright weather, and this passage would be completely stopped, and it would be absolutely impossible to advance by that route. But the condition of things changes from year to year, and this is what our Ladakis meant when they said they could not guarantee that this route would be practicable that year. Had the passage been blocked by the ice, we should have been forced to make the three days' *détour* to which I have already alluded. However, the road was open, though there was only just room for us to get past without lifting the loads off the horses; and, strange to say, we succeeded without having a single leg broken in the deep holes that gaped between the ice and the fragments of rock.

After that we continued north-west up the glen, marching sometimes on the gravelly bottom, sometimes on the sheets of ice, until we came to the still bigger glacier-arms of the Chong Kumdan. These do not, however, stop up the road, although there is but little room to spare. Their front, abruptly broken, almost vertical, indeed, sometimes overhanging, is, in general, 20 metres high. The whole of the glen was here sheeted with ice, formed from the thaw-water. This glacier possesses far more moraines than the former, and a large portion of its arms is completely covered under grey detritus, through which the base rock projects here and there. The ground-moraine appears, however, to be more developed than the top or side moraines, so far, at least, as it was possible to judge from the front of the glacier. It is surprising that there exists no trace of any frontal moraine; but not even the smallest ridgelet of gravel is thrust forward by the ice. Yet such must inevitably be formed at times, though where they are forced by the pressure of the ice behind out into the middle of the rivulet that leaves the glacier, they are soon worn down and carried away by the water. From our route we were not able to see anything of the 'firn' region from which the ice-streams of the Kichik Kumdan and the Chong Kumdan are fed; we could not even see the tops of the glaciers themselves. Yet judging from the size of the glaciers in front, it is fair to infer that the gathering grounds of the ice must attain pretty large dimensions.» Scientific Results of a Journey in Central Asia 1899—1902, Vol. IV, p. 410 et seq.