

fortunate. At Sánjú one of them was blown down in front of my tent by a sudden violent gust of wind, and the very next day another, which I had entrusted to the care of Dr. Bellew, was, on account of the length of the march, given to a horseman to carry: the horse fell in crossing a river and No. 2 was smashed. The third survived, and regular observations were taken with it throughout the winter in Yárkand. It too was broken on the return journey, its carrier falling with it in a stream.

I was also provided with numerous aneroid barometers, hypsometers and thermometers. The latter I had specially made to order in England, as none that I could procure in India were graduated low enough to register the minimum temperature to be expected in the higher ranges of the Himalayas. As was to be anticipated in a journey like ours, very many of these have been broken; loose horses getting at night amongst the tent ropes, and in the extreme cold weather even inside the tent, have much to answer for.

While at Dehra Dún* prior to starting I was occupied in making myself familiar with the instruments I was about to take with me, and in practising the observations I should probably chiefly be dependent on; in drawing up and getting lithographed portable and compact forms for registration and computation of observations, and other miscellaneous preparatory work. I prepared a large number of sheets with all the most northerly points fixed by the Great Trigonometrical Survey on the frontier of India projected thereon, as well as the latest determinations of the Russian survey; in order that by whichever route we might go or return, or wherever we might wander, I might lose nothing for want of previous preparation. These charts were not of so much service to me as I had hoped, as wherever there was a chance that they might be utilized, the vicissitudes of the climate, and the rapidity with which we had to travel, invariably interposed to prevent my making full use of them. Colonel Walker also designed, and had prepared and photozincographed, a star chart, projected on a new principle, showing only stars of the first three magnitudes, nautical almanac stars being distinguished from all others. I found this chart a very valuable practical guide while observing.

On Sir Douglas Forsyth's application to Colonel Walker four of the Great Trigonometrical Survey "Pundits," or rather two of the old Pundits with two assistants, were attached to the Mission, as it was hoped that an opening would occur for the despatch of these men from Eastern Turkestan across the Gobi Desert and through Thibet to Hindustan. It was not deemed advisable however to employ them thus, and when the Mission advanced from Yárkand to Káshghar it was necessary to leave them in Yárkand. Permission was given, however, for one of them to follow me to Káshghar, and he did useful work, of which more hereafter. The remainder were employed in Yárkand during the winter in taking meteorological observations.

Road to Yarkand.

For a few marches from Leh, in every direction, the country has been carefully and correctly surveyed and mapped in former years by parties of the Great Trigonometrical Survey under Major Montgomerie, R.E., but between this rigorously executed survey (bounded on the north by the head waters of the Núbra and Shyok, and on the north-east by the Ling-zithung plains) and the table-lands of Turkestan, lie vast tracts of mountainous country, parts of which, through the enterprise, zeal, and energy of Messrs. Shaw, Hayward, and Johnson, have been mapped with tolerable accuracy, while other parts have probably never yet been traversed ~~by man, certainly not~~ by geographers. It was my object to weld together as far as possible the existing materials into a harmonious whole and to add whatever I could to existing data.

It had been decided that the Mission should proceed to Sháhidúla in two parties, the headquarters going by the old Kárákorum route, whilst a detached party, consisting of Captain Biddulph (in command), Dr. Stoliczka, and myself, was directed to proceed *viâ* Changchenmo by the route by which the former Mission returned from Yárkand in 1870, and as we had

* The Head-quarters of the Great Trigonometrical Survey.