oases from the foot of the mountains, is far broader to the east than to the west of Khotan. The varying width of this glacis of gravel and detritus washed down from the mountains is in direct relation to the magnitude of the ranges which it skirts. Whereas the mountains to the south of the Karghalik–Khotan route are only offshoots of an outer range of the Kun-lun system, there rises behind the belt of Dasht east of Khotan the mighty rampart of the northern main range.

Water-supply of oases.

Now this difference of the orographic background has a very marked effect upon the water-supply of the strip of fertile loess ground which intervenes between the 'Sai' and the high dunes of the desert, and which that water-supply alone renders capable of cultivation. The main range east of Khotan, with its ample and partly glacier-fed drainage, sends forth a number of relatively large rivers, like those of Chīra, Keriya, Niya, Yārtunguz, and Endere. But much of their water disappears on their passage over the broad 'Sai', the uniform surface of which facilitates the constant formation of fresh divergent channels during the summer floods. The water thus absorbed reappears near the lower edge of the 'Sai' in abundant springs and marshes which, as we shall have occasion to detail hereafter, form an important factor in the irrigation system of all existing oases between the Yurung-kāsh and Niya rivers. The information collected by me at the oases stretching from Chīra to Keriya plainly shows that the level at which this supply of spring-water becomes available for irrigation is subject to frequent and great fluctuations, and the evidence of settlements deserted or newly started within the last few generations confirm the local traditions on this point[3]. It is clear that similar conditions must have prevailed throughout the historical period. If we further consider that the large amount of water carried down by those rivers must in times of prosperity and denser population have afforded wide scope for systematic irrigation works, which were abandoned subsequently during periods of decay, the great variations in the line of oases within this region become intelligible.

The conditions found in the string of small oases along the route west of Khotan are distinctly different. On the one hand the amount of water provided by the streams of Kilian, Sanju, and Duwa, is far more limited; for none of them is fed by glacier-sources, and their drainage area is restricted to comparatively narrow valleys. On the other hand, probably owing to the narrowness of the 'Sai' belt, springs are of relatively rare occurrence, and their supply of water is not a serious factor for irrigation. We can thus understand why none of those streams could in historical times ever have carried their water far beyond the northern edge of the 'Sai', which the line of the existing oases closely follows; and also why those minor shiftings of the cultivated area from south to north, and vice versa, which east of Khotan seem a regular feature wherever irrigation is largely dependent on springs, cannot be traced here.

Irrigation dependent on flood-water.

It is, in fact, mainly upon the floods fed by the melting snows of the spring, and by occasional heavy rain in the mountains, that the oases from Gūma to Piālma depend for their irrigation[4]. It is likely that in early periods, when the population was denser and labour plentiful, means were found to distribute the water of these floods more extensively over the loess terraces, which are found at numerous points between the existing oases, but are not now reached by canals or natural watercourses. The extensive débris-strewn areas, known as 'Tatis', which are passed on the road between Gūma and Moji, support this assumption. But of ancient sites at any distance to the north of the present line of oases I could, notwithstanding careful

[3] Compare, below, the information collected regarding the oases of Domoko and Gulakhma, chap. XIII.

[4] See Hedin, *Reisen in Z.-A.*, pp. 11–18, where ample details are recorded about the facts of cultivation, &c., in these oases.