have again a case, like the one already considered in connection with the terraced valleys of the Kopet-Dagh, of a series of decreasing maximum records, before and between which a number of minimum records may have been made, only to be destroyed by the next stronger record. The preservation of four or five records makes it probable that the total number of glacial epochs in the Tian Shan was as many as six, eight, or ten.

We fully concur with earlier observers to the effect that there are no indications of general glaciation in the region that we crossed.

GLACIAL EROSION IN THE HIGHER RANGES.

This excursion across the Tian Shan gave me the first opportunity of seeing high mountains since reading Richter's Geomorphologische Untersuchungen in der Hochalpen (1900). I therefore gave especial attention to the form of the mountains to determine how far Richter's thesis holds good as to the action of glaciers in sharpening the peaks and crests by causing the retreat of cirque walls. There was repeated occasion to test the thesis, and it seemed to hold good in every case.

The Kugart pass, over 10,000 feet in altitude, and with the higher summits of the Fergana range on either side, presented no sign of glaciation. It is possible that some cirques occur not far to the southeast, but clouds covered the mountains too heavily in that direction at the time of our crossing to make sure. All the mountain forms by the pass were the result of the normal processes of erosion. The ridges were all dominated by the down-slope lines of creeping and washing; and all the down-slope lines, decreasing in declivity as they were followed, combined in an elaborate branch-work system, adjacent lines always meeting in accordant grade at their innumerable points of junction. In other words, the ridges were maturely dissected. As seen in profile, the down-slope lines had relatively little variety. Except for a small convexity near and at the crests, they were concave to the sky, and were systematically of decreasing slope downward through all their length, from mountain top far down the valley. This was particularly true for the stream lines of the many ravines which gather water and waste from the sides of their inclosing spurs, and which were prevailingly graded along their courses. It was true, also, to a remarkable degree for the waste-stream lines on the spur slopes, which were broken only by scattered outcrops of the stronger rock masses, and then only to a moderate amount. Here and there patches of hackly, ungraded ledges stood forth, not yet reduced to order; but on the whole the graded down-slope lines were remarkably well developed. The variety of these lines was shown in their plan rather than in their profile, and even in plan their variety is systematic. The stream lines branch over and over again, as they are followed uphill, and the spurs are split repeatedly by the large and small ravines that fork beneath them; but that is all. When the mountains are looked at hastily their variety of form seems confused, but when the forms are more patiently analyzed their variety is seen to result almost entirely from small changes on a simple scheme, and every element of form finds its explanation in the processes of normal erosion carried to a mature stage.