

XIII there was, dipping 72° towards the S. 40° E., a hard variety of rock, which emitted sparks when struck, and had a conchoidal fracture.

July 25th. From Camp No. XIII we proceeded up the slowly rising side-glen which leads to the pass of Avras-davan in the crest of the Kalta-alaghan. Along its bottom trickles a little rivulet. The principal glen, which we thus left on the east, comes from the south-east, from loftier parts of the Kalta-alaghan and its northern spurs.

The view which opened out south from this pass (altitude, 4786 m.) was very different from those we had obtained from the northern ranges. Instead of a single distinctly outlined parallel chain, the scene was perfectly confusing from the multitude of peaks, crests, ridges, and ranges, that met the gaze; to unravel them all and map them properly would be a work of months. A reconnaissance such as that of mine, confined to one single line across such a mountainous chaos, can offer but a small contribution towards the solution of the problem. The details in the immediate vicinity of the route are correct; but with regard to the relief of the country farther away on both sides I was frequently in uncertainty. The first objects that arrest the eye, looking from the pass, are three gigantic snowy complexes, which stand out in a particularly conspicuous fashion. In the S. 21° E. was the culminating point of a gigantic snowy range stretching from east to west, while due south we observed an isolated snowy bluff, forming apparently a continuation of the former. In the S. 11° W. there was yet another snow-capped range, lying along the prolongation of the first two. All these chains rise south of the basin the deepest part of which is occupied by the two lakes of Kum-köl; but neither of these is visible from the pass of Avras-davan, owing to their being masked by various lower heights. Between the Kalta-alaghan and the southern snowy range there are several other ranges, partly spurs and ramifications of the first-named, and partly parallel chains lying between the two principal systems. In the far off distance we could just make out on the southern horizon, though with difficulty, another snowy crest, barely distinguishable from the white clouds; this consequently overtops every other range within sight. It was the Arka-tagh, the loftiest range containing practicable passes, not of Asia only, but of the whole earth.

From the pass we descended due south by the glen of Avras, which was at first pretty steep as well as gravelly; but gradually it widened out, the surface at the same time growing leveller, and finally emerged into a main glen coming from the east and traversed by a small rippling rivulet. On some of the adjacent slopes we found fuel. To the north-west and west was a gigantic wing of the Kalta-alaghan, crowned by several snowy peaks, though their flanks were perfectly black, and they are footed at their base by rounded heights that fall away towards the bottom of the new latitudinal valley.

Just above the pass of Avras there was a thick dyke or vein of diorite (?), stretching from S. 50° E. to N. 50° W. Immediately south of the pass was porphyry, which a little lower down was bedded at an angle of 63° to the S. 70° E., and lower still at 67° to the S. 10° W., 87° to S. 10° E. and 82° N. We made Camp No. XIV (4477 m.) at the point where the glen of Avras joins the upper part of the latitudinal valley. There the left side of the stream that flows down the latter