

— Wo der Wind nicht ausschliesslich oder vorwiegend aus einer Richtung weht, bilden sich mehr rundliche und öfters wechselnde Sandhügel, bisweilen auch fast ebene Sandflächen.»*

All these conditions are abundantly fulfilled for Central Asia, and the deviations in the shape of the dunes, which Fritsch says arise when the winds are not constant, are precisely what we find in the Kum-tagh and in the desert at Tung-hoan. The heaping up of exceptionally big dunes on a relatively small area like the Kum-tagh must be due to the fact, that there are there no prevailing winds, that is to say, to the fact that the winds vary, and that the winds which blow from the various directions counterbalance one another in force. To some extent however the north-east wind would appear to be rather the strongest, for while Grun-Grschimajlo tells us that the natives have never observed the slightest tendency on the part of the dunes to advance, he himself states that the river of Pitschan once flowed between Jan-bulak and Dga and emptied itself into the Assa, and that its bed is now buried under the sand. Now this does of course imply an advance of the dunes, and an advance moreover towards the south-west or west-south-west.

In the desert of Ak-bel-kum we have found that the south-west winds prevail as a matter of course, and consequently the dunes extend from north-west to south-east. It would therefore appear that in this desert the relief and architecture are more homogeneous, whereas the Kum-tagh appears to consist of a single accumulation of sand, composed of course of countless individual dunes that have climbed up over each other in such a way that the relative altitude increases towards the centre of the sandy area. The great difference between the Desert of Tschertschen and the Kum-tagh lies therefore in this: in the first-named the effective winds keep sweeping across it in the same fixed direction, the consequence being that the dune-accumulations taken as a whole all have approximately the same relative altitude and the same perpetually recurring relief; further, that the masses of sand themselves travel unceasingly towards the west-south-west, and the oscillating paths they may chance to follow under the influence of other winds produce no effect whatever upon the general relief of the desert; whereas in the Kum-tagh the winds are on the contrary so irregular that no uniform type of relief has ever been able to develop, because no sooner are the masses of sand disposed in one direction by a given wind than they are shortly driven back again by another wind, blowing from the very opposite direction. That part of the depression of Luktschin which is filled with sand is therefore a sort of sink or lumber-room into which the disintegration products of the encircling mountains find their way before the winds that blow from every quarter except the west, and in this way help to augment the general mass of the dunes. If any one wind were here decisively predominant over the rest, the sand would overwhelm the region to the leeward. Nor would the proximity of the mountains offer any hindrance to this process, because the dunes are able to a certain degree to climb up the slopes of the mountains, as we have seen them do, for example, up the slopes of the Tusluk-tagh in the west of East

* *Allgemeine Geologie*, p. 209.

Hedin, Journey in Central Asia. II.