ORIGIN OF THE EXISTING RANGES OF THE TIAN SHAN.

When the features here described from Son Kul to Semipalatinsk are considered in a broad way, they suggest many reflections of interest in theoretical geology. The extended occurrence of surfaces of small relief, indifferent to the rock structures which they truncate, implies a long cycle of uninterrupted degradation, continued past late maturity, even to old age. The earlier form of the eroded region may well have been mountainous; witness the steep-dipping or vertical strata seen at various points, as well as the occurrence at the surface of rocks whose origin must have been deep-seated, like granites. The agency of erosion was not the sea, of whose presence in modern geological time the region gives no indication; nor was it the lateral swinging of rivers, as Philippson (1898) has supposed for the plains of central European Russia, for the eroded surface frequently possesses a minor relief that is inconsistent with such a process of planation. The various processes of subaerial erosion, of which the swinging river is but one, best explain the widespread peneplanation here observed.

Although the peneplain was not observed by any means continuously from Son Kul to Semipalatinsk, there is good ground for thinking that it once stretched as an almost continuous lowland, interrupted only by residual ranges, over all this distance, and indeed over still greater distances; for it is not reasonable to believe that a cycle of erosion which sufficed to develop a peneplain even on granitic rocks should find other rocks resistant enough to maintain a great relief, unless, indeed, uplift came to aid resistance. There is, however, no direct evidence of uplift during the cycle of peneplanation. Where great relief occurs in the region to-day, it is accompanied by the suggestion of uplift after peneplanation—or, at least, after a very late mature stage of erosion—had already been reached. Witness the peaks of the Dongus-tau below the westward prolongation of the highland surface of the Bural-bas-tau, or the peaks of the central Kungei Ala-tau below the eastward prolongation of the even crest in the western part of the same range. If certain ranges do not to-day present such evidence of a former cycle of erosion, it is more consistent with the general features of the region and with the general principles of mountain sculpture to suppose that they have lost the evidence than that they have never had it.

This conclusion, based on my own observations, is strongly supported by the observations made independently by Mr. Huntington and presented in the report on his Kashgar journey. He describes large highland areas of the Tian Shan between Issik Kul and Kashgar as broadly uplifted peneplains, here and there bearing subdued mountains, the whole being in process of revived erosion. He therefore names the region "the Tian Shan plateau." It is, as he happily phrases it, not actually but only potentially mountainous. Previous observers have recognized the plateau-like highlands of the Tian Shan, but most of them do not seem to have recognized their meaning. Roborovsky, reporting on an expedition led by Pievtsoff in 1889, briefly describes a high plateau, between Issik Kul and the Tarim basin, called the Syrt, 100 miles wide, and at an altitude of 10,000 or 11,000 feet. "Scattered over it are separate mountain groups and ridges, running east and west" (1890, 23). St. Ives, who crossed this region later, says that it is an immense