floor of the latter is half a mile wide and very flat where it is not cumbered by the third moraine. Many of the smaller valleys tributary to this one are themselves glacial in form and open in the sides of the main valley at heights of 300 or 400 feet, in true hanging-valley arrangement. These features are due to the work of the glaciers of the first and second epochs, and their freshness as compared with the weathering of the moraines is a good witness to the great influence of solid rock as contrasted with rock waste in preserving physiographic forms. About 6 miles below the junction of the Juuka and Jukuchak streams, which unite at the end of the third moraine to form the Yak Tash, the valley loses its glacial form and broadens into a basin 5 or 6 miles wide and 8 or 10 miles long. In this lies the second moraine, forming a great horseshoe. It still retains much of morainal form and has numerous undrained basins, many of them filled with ponds. On account of its breadth and flatness, it has suffered less erosion than has its steeper and narrower successor. The Yak Tash River flows through it in numerous braided channels, which wander freely over a gravel flood-plain a mile or two broad.

So far the moraines of the Yak Tash lie in a linear series like those of all the other valleys that we have considered. The relation of the first and second moraines is quite different. South of the Yak Tash 3 or 4 miles the character of the country changes quite abruptly as one passes from the second moraine to the first. On the north is the second moraine, a flat country studded here and there with bowlders and pitted with numerous little holes and irregular depressions. It is very clearly a moraine, for although the slopes are everywhere well graded, the drainage is irregular and by no means completely established. A belt of country south of this is 100 or 200 feet higher and has a thoroughly established drainage system, to which every part is tributary; the main river has cut a valley several miles wide through this belt. There is not a sign of kettle-holes or other glacial topography and at first sight there is no sign of moraine; here and there, however, large bowlders of slate or oftener of granite from 3 to 6 feet in diameter rise out of the smooth, fine soil, and smaller, angular bits of rock of various kinds are scattered about on the surface. These lie largely on hill tops, where they can have been brought only by glaciers, and are therefore to be regarded as belonging to an ancient moraine. The branch and main valleys are 200 or even 300 feet deep, and are cut through the moraine into an underlying deposit of soft silt. Apparently a glacier flowed into this basin soon after a great deposition of silt had taken place, and because of the flatness of the district the ice spread out broadly and deposited an extensive morainic sheet 10 to 50 feet deep. A period of subaerial erosion ensued, during which the ice retired long enough and far enough to allow the submature dissection of the moraine and of the underlying silts, and to allow the river to cut a valley 5 or 6 miles wide through both deposits. The ice must have stood much farther upstream during this epoch of erosion, and at its close must have again advanced to deposit the second moraine in the valley that had been eroded in the first moraine.

(5) *Moraines of the Kan Su Valley.*—In the Kan Su Valley all five of the old moraines can be detected in addition to the modern one, but the first and second are not well differentiated and do not need to be considered. The third moraine lies at an elevation of about 9,000 feet in the triangle between the two main branches