

where the whole stream was tilted in one direction, but the resulting forms would be similar in appearance. They could be distinguished from climatic terraces only by means of a careful study of their height at many places and of the irrelaton to uplifted areas and to the mountains along the course of the stream. There is, however, one respect in which the Heri Rud affords a valuable clue to the origin of the terraces. Closely associated with the river, and in one case forming part of its system, are some small lakes showing phenomena which it seems impossible to explain on any hypothesis except that of climatic change. If a study of these shall show the terraces of the Heri Rud to be of climatic origin, there is a strong presumption that the terraces of the neighboring streams are due to the same cause.

In its lower course the Heri Rud closely resembles the Murg-ab. At Tejen it flows upon the surface of the plain and is also liable to the extraordinary floods described in Professor Davis's report. At Serakhs the cross-section is much like that of the Murg-ab at Hindu Kush, with the river flowing in a deep channel about 10 feet below what may be termed either a lower terrace or an elevated flood-plain, and with a second terrace 20 feet high rising to a broad alluvial plain. Fifty miles farther upstream, at Pul-i-Khatun, below the lower gorge, there are four terraces. The lower one is small, as usual; the second forms a broad plain half a mile wide, on which is located a Russian military post to guard the only bridge in this part of the country; the third is narrow, though distinct; and the fourth is the rather flat tops of the surrounding hills of old alluvium. But little was seen of the 35 miles of the river between Pul-i-Khatun and Zulfagar (Zulfikar) at the northwestern corner of Afghanistan. Most of the way the river flows in a narrow gorge, and whatever terraces may have existed are naturally destroyed for the most part. Just south of Pul-i-Khatun, in a relatively open stretch, two were noted, composed of gravel which had clearly been brought in as a filling after the work of valley-making had reached practically its present stage.

At Zulfagar, in the ancient lake basin of Zorabad, the valley of the Heri Rud again widens, and at once the number of terraces increases. In one side valley five terraces were noted cut in the ancient lake clays; in two or three others the number is four, while in many cases there has been so much undercutting or change of some sort that only the minimum number of two is preserved. Along the main river the terraces, where best preserved, number five, of which the first, third, and fifth are usually strong, while the second and fourth are weak or missing. Some 10 miles south of the Afghan boundary and a little upstream from the dam of Dat Mehemet Khan, a very significant section is seen on the right bank of the river as one looks downstream from the cultivated fields east of Khatayi, on the left side of the river (fig. 157). Here the gravel remnants of what seem to be the third and fourth terraces, counting from below upward, are seen to lie on a slope of westward-dipping shales which must have been subjected to erosion. They indicate that before the formation of each terrace the valley must have been cut well below the level of that terrace, though not necessarily to the present depth, and then filled with gravel. This is not absolutely inconsistent with a tectonic origin of the terraces, but inasmuch as this section lies close to what must have been the axis of any supposed