the plains, the rivers of late Tertiary time must have had a much smaller quantity of coarse detritus; for, at that epoch, the mountains had been reduced to relatively low relief, as will be shown particularly in Mr. Huntington's report, and the waste that they then shed must have been for the most part of fine texture. It appears, therefore, that a very careful examination of the fresh-water Tertiary and Quaternary strata in the plains of Turkestan should be made with a view of determining not only the date, but also the physical conditions of their deposition. It is evident that the opportunity for organic life, and especially for human life, would have been very different, according as the plains are of lacustrine or fluviatile origin. Inasmuch as many mounds and ruins occur within the area of debatable action, the solution of this problem has a close relation to the objects of our expedition.

THE AKHAL-TEKIN OASES.

The gently sloping plain that lies piedmont to the Kopet Dagh and the associated ranges—the mountains that divide Persia and Turkestan—is a case in point. The plain here receives from point to point sufficient water from the mountains to support a series of villages, known as the Akhal-tekin oases. The Central Asiatic railroad, from Krasnovodsk to Tashkent, naturally was constructed through this settled belt on the way into the interior. A section of the mountains at Kizil Arvat is given by Bogdanovitch (1887), in which the north-dipping Miocene limestones and clays on the crests and flanks are followed by the horizontal layers of the plains, which are labeled Aralo-Caspian. Again, Konshin's sketch map (1896) of the Quaternary sea brings its border close to the mountain base at Kizil-Arvat. He had earlier (1883, 383) reported the occurrence of variegated clays in the gorges back of Kizil-Arvat, which he referred to the Pliocene Aralo-Caspian.

During our brief stop at Kizil-Arvat we rode out to the mountains and had a good view of their structure. The mountain-making rocks are heavy limestones, underlaid and overlaid with clays or shales, all compressed into great folds, and much denuded. We looked from one of the anticlinal limestone ridges into an inner synclinal valley, where the weak clays that overlie the limestones were terraced. The stream from this inner valley cuts a narrow gorge near the end of the west-pitching limestone anticline, but the road follows a valley around the west end of the anticline. Where the stream issues from the mountains it has terraced the reddish and yellowish clays on the northern slope at several levels, and has strewn gravels on the terrace floors. The terraces decrease in height northward, as if they would merge in the plain, but the front of the higher terrace has been much consumed and eroded into a sort of bad-land topography, shown in fig. 22, during the production of the lower terraces. This suggests a recent uplift, with its greatest measure in the range and rapidly decreasing toward the plains. The spurs of the mountain ridges hereabout seem to have been graded to moderate slopes with reference to the uppermost terrace, while narrow ravines and gulches are cut in the mountain flanks with respect to the present valley floors. Evidently a much longer time must have been devoted to the erosion of the highest terrace floor, which once extended continuously along the mountain base, than in opening the