

chief ungraded streams of several neighboring mountain ridges. Yet such must necessarily be the case, if the gravels and their terracing are due to a tectonic cause. The most probable explanation is that they occur in valleys which are ordinarily ungraded and hence subject to erosion, but which became graded during one of the fluvial epochs, perhaps not the latest, when the climate was so altered that even these valleys assumed a graded condition and were floored with flood-plains of gravel.

The Nemeksar, or playa of Khaf, is a broad, almost waterless expanse of salt, much like the Pul-i-Khatun salt lake. In the late winter it is said to be entirely covered with water, although in mid-December we saw but a few detached bits of open water and were able to ride out nearly a mile before the mud became disagreeably deep. On the northern edge of the playa, where high mountains rise within a few miles, huge fans of coarse, angular gravel terminate close to the edge of the playa floor. Where they approach this most nearly they end in a distinct bluff, which is from 6 to 10 feet high and has its base 10 or 12 feet above the edge of the area that seems now to be subject to inundation. Between this latter limit and the foot of the little bluff there is either no gravel or else a little very fine grit that has been brought in recently. The greater part of the formation here is a very fine silt, crusted thickly with salt. Where the fans do not extend as far as the line at the base of the bluffs, they die out gradually and irregularly on a deposit of silt of the kind just described. In their upper courses these fans are dissected by channels which at first grow deeper until they reach a maximum of 12 or 15 feet near the middle of the fans, and then decrease toward the playa. They appear to be channels cut during a fluvial epoch through a zone of maximum deposition formed at a previous time of greater desiccation. The phenomena along the edge of the playa seem to indicate a somewhat higher stand of the water at no very distant day. The high-water level of the present is indicated by an ill-defined beach a few feet below the base of the little bluffs. Along the east side of the playa, as to the north, the main tributary valleys show two strong terraces which sometimes reach a combined height of 100 feet. They are of the usual type, deeply covered with gravel. Where the formations surrounding the lake consist of soft Tertiary formations, there is some indication of ancient undercutting by the waves at higher levels. This feature is much better shown in the playa of Kulberenj, which lies in the Khaf basin a little to the south of the main playa.

KULBERENJ.

At Kulberenj the whole playa is surrounded by two strong lacustrine terraces, one of which rises from 20 to 25 feet above the playa floor, and the other over 50. Below these there is in places a faint third terrace which would be too indefinite to mention if it were not that in other places similar traces of a last faint terrace-making epoch are evident. The two larger terraces consist of fine silt, on which is a cover of gravel 4 or 5 feet thick. Whether or not the silts are the deposits of an ancient lake of great size is not certain, although it is probable. The cutting of the terraces is clearly the work of three different lakes, or of one lake working at three different levels. Naturally the tributary valleys are terraced to correspond to the lake. The phenomena of Kulberenj, Khaf, Pul-i-Khatun, and Shor Kul in Chinese Turkestan (see the report on Turkestan), all agree in showing that two or three times in