We were led to conclude that the crustal movements during the deposition and the deformation of the Narin strata should be associated with the movements that have given rise to the present relief of the Tian Shan. The red color of the basal beds, seen not only on the south side of the Chaar Tash, but in the southern distance along the north base of the Kalkagar-tau, is consistent with the reduction

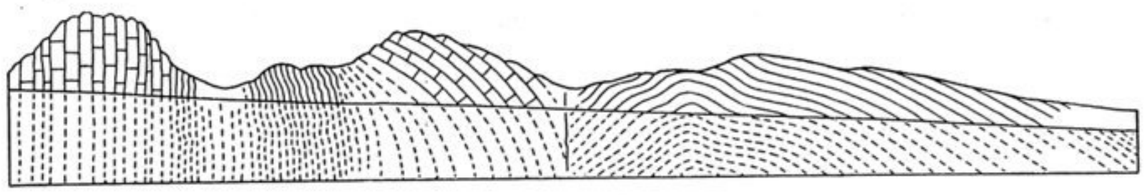

Fig. 61.—Four-mile section across the northern border of the Narin formation, looking east.

of the region to lowland form before the beginning of the deformation by which the Narin deposits were initiated; yet the inclosing ranges to-day have serrate crests without indication of having ever been peneplained. Some smaller valley deposits, probably of Tertiary date, will be described in the next section.

THE RIVERS AND VALLEYS OF THE TIAN SHAN.

If the theoretical considerations presented in the chapter on the Tian Shan are well based, we should expect to find streams of several kinds among the western ranges of this mountain system. Those of the first kind would continue from the former cycle of erosion, but would be revived to renewed activity in consequence of a favoring elevation of the region. The valleys of these revived streams would be seen to-day where the relief of the former cycle remained in greatest strength, or where the new uplifts did not defeat the streams. Streams of a second kind would persist from the antecedent cycle of erosion in spite of an unfavorable elevation of the region. The valleys of these antecedent streams would be expected where the streams were largest and where the unfavorable uplifts were not too strong. Streams of a third kind would be of new establishment, following the slopes produced by the movements which introduced the new cycle. They might be called new consequents, and they would be expected where the movements were strong and the pre-existent streams were weak. A fourth class of streams would include all those developed in the new cycle by headward erosion along belts of weak structures exposed in the valleys of the other class. Such would be called new subsequents.

Examples of revived streams are probably to be found in the central plateau-like region described in Mr. Huntington's report. The gorges cut through some of the ranges suggest an antecedent origin. The gorge by which the Narin cuts through the eastern end of the Chaar Tash, just below the entrance of the Alabuga, the gorge of the Juvan-arik in the Yukok-tau range (fig. 43), and the Buam gorge of the Chu northwest of Issik Kul, all may be of this kind; but the case is not clear. New consequents appear to be numerous on the northern face and on the southern back slope of the Alexander range, and in the longitudinal depressions between the ranges near the west end of Issik Kul. New subsequents of relatively small size are probably of common occurrence as branches of all the other kind of streams.