

The introduction of irrigation would seem to indicate that in the climatic progress towards aridity, a stage had been reached at which agriculture was too precarious or, as now, impossible without artificial watering.

We are not in a position to determine whether irrigation was practised by the people of the South Kurgan during either the later or the earlier period. In two of our shafts we found 22 feet or more of irrigation silts, which may possibly include material due to irrigation during the iron period of the South Kurgan.

We can not well suppose that the people of the copper period were without knowledge of the principle of artificial watering, since we have evidence, among our finds, that there was more or less intercommunication between Anau and the Babylonian sphere of culture. But the deep cutting-down that occurred after the disappearance of the copper culture was doubtless accompanied by more or less degradation, or at least by such a dissection of the surface explored by our shafts that we might very easily have missed any surviving traces of artificial watering.

If we look at the present climatic conditions ruling throughout Turkestan, we find that irrigation is now almost everywhere essential. The only exceptions are the high valleys and the piedmont borders of the more lofty ranges. At a few points, as near Samarkand, grain is planted on the mere chance of there coming once in two or three years enough rain to mature a scanty crop, but along the piedmont plain of the Kopet Range there is no local precipitation after March.

But we seem to be now in an arid extreme of the present climatic cycle. Moreover, it is not unlikely that the climatic conditions, as regards vernal precipitation over the border zone in which Anau lies, have been on a descending scale as a whole, each arid extreme becoming more arid than the preceding one; and this would be in agreement with our hypothesis.

The arid extremes of the climatic fluctuations, which coincided with the disappearance of the different cultures of the kurgans, and seem to have caused these interruptions, were very probably less dry than is now the case, but they were doubtless sufficiently severe when the city of Anau was founded to render the previously practised system of agriculture useless for the maintenance of population and of domestic animals. Not until the introduction of the artificial distribution of water was it possible, thenceforth, to maintain a continuity of civilized life.

That even as late as the date of this improvement, apparently about the fourth century A. D., the volume of water brought in the streams was considerably greater than to-day is shown throughout Turkestan by the much greater extent of the irrigation canals and oases during the earlier centuries of our era and down to medieval times.

The introduction of irrigation reversed the order of the delta-building processes. By bringing all the water under control through the season in which it carries sediments, and distributing it evenly over the delta, the aggrading shore-line was kept back at the apex, instead of receding towards the desert, and the delta was continually built up over its whole extent. That this has been the case ever since irrigation began is shown by the fact that, since the first layers of irrigation