

the evidence of a period of desiccation immediately preceding the founding of Ghiaur Kala and contemporaneous with that in which the cutting-down of the valley occurred at Anau between the copper and iron cultures.

Standing on the citadel of Ghiaur Kala and looking north, one can see nearly thirty high ruins of ancient sites scattered over the delta-oasis. And Mr. Huntington, as he shows in his report, found numerous others spreading out far beyond these. While the highly deformed and wasted shapes of some of these show that they belong doubtless in a previous cycle, many others belong clearly in the present cycle, and some of these seem from their state of preservation to have been abandoned less than a thousand years ago. One of these, Odontche tepe, which lies on the desert 10 or 12 miles north of Ghiaur Kala, proved not only by its state of preservation, but also by pottery identical in character with that of the later layers of Ghiaur Kala, to belong in the earlier centuries of our era. Of these sites the older, greatly wasted ones appear, as stated, to belong to the previous or copper cycle, when abundant water kept the delta and its apex farther north. Ghiaur Kala was founded in the next or iron cycle, after the reactions to dryness had caused the apex of the delta to retreat far enough upstream to spread the silts over the previously free loess surface. And the many better-preserved sites mark the later stage of recuperating climate which carried the delta again to the north, or at least extended its alluvions farther downstream. The wide distribution of these later sites indicates a period of prosperity and extent of population that seems to have required a much more abundant supply of water than could be derived now from the river Murg-ab. This view would seem to be fully confirmed by Mr. Huntington's observations on the Merv Oasis in this volume, where he gives the evidence towards showing a shrinkage of the water-supply within the last centuries. The era of prosperity preceding the present great decline coincided closely with the period of abundant water-supply in Persia, which Mr. Huntington, in our previous volume, after an analysis of the historical data in the light of his own extended physiographic investigations in Asia, states must include the time of both Alexander, 300 B. C., and Istakri, 900 A. D.

Lastly, while observations show that the surface of landlocked seas, like the Aral and Balkash, are subject to negative and positive movements of short cyclical character, there is evidence, both historical and in the traditions of natives, that there has been during our era, a very considerable lowering of the surface of these waters. This is confirmed by a comparison of maps of the 18th century with those of to-day, which show a shrinkage of thousands of square miles of area in the Aral and Balkash, and the total drying up of many smaller bodies of water.

Turning now to plate 5, we find that the evidence offered in the parallel sequence of physical and human history is all in the direction of confirmation of the hypothesis of recurrent climatic changes, in which the deepening of our valley in the zone of tilting were due to periods of diminished volume of water. The two kurgans were founded early during aggradings. The iron-culture settle-