

It may, therefore, be said that the kurgan remains of most favored oases, those where water was easily led and found its way in flood, have been eroded and buried, wholly obliterated unless they were occupied over 0.57 of the time since their foundation. Or, any such city, founded 5,000 years ago and not occupied at least 3,000 years, has vanished. Such must have been the fate of those where the plains are always aggrading; but along the borders in the region of uptilting piedmonts, where oases of type Ib and type IV abound, aggradation was apparently so counteracted by crustal movement that during dry periods some areas rose above it altogether. It is to that process we owe the preservation above ground of both kurgans at Anau. The piedmont on which they rest appears to have been uplifted so nearly as fast as the plain aggraded that during all of 10,000 years no more than 20 feet of sediments has risen around the North Kurgan, though during that time it seems likely that about 80 feet have been deposited farther out in the desert. As a check upon the logic of our equations, it is interesting to solve for occupation on the North Kurgan. Knowing the total remnant thickness of culture, 60 feet, and assuming Professor Pumpelly's estimate of time since foundation, 100 centuries, we have: taking the remnant height,  $h = lG - E(t-l)$ ,  $64 = l \times 2 - 0.8(100-l)$  or  $2.8l = 144$  and  $l = 51.5$  centuries. Then its original thickness,  $lG$ , would have been  $2 \times 51.5 = 103$  feet, of which it has lost by erosion 43 feet. This, taken in view of the deformation testified by its profile, the upper part having withered to a rounded form leaving a base under ground of twice the diameter of that above ground, seems a conservative estimate. There is, however, no reason to suppose that it had ever attained a thickness of 103 feet at any one time. This accumulation may have resulted during several periods of occupation, between which it was abandoned to erosion. That part of its growth was during reoccupation of comparatively recent times is evidenced by quantities of late pottery and débris, deep-buried in the wash under its surrounding plain, having drifted down there from above, though now absent on top.

An examination of the surface and gully-sections of 20 or 30 kurgans on the zone of constant aggradation, revealed no indication of anything over 1,000 to 3,000 years old, and such was Mr. Huntington's experience in his study of 20 or more kurgans north of Merv. To one having a general idea about rates of erosion and aggradation in this region, it is no surprise that nearly all the kurgans of Central Asia seem to belong in the last 2,000 or 3,000 years. There can be very few as old as the North Kurgan at Anau still above ground.

But the very fact that Central Asia has been progressively drying up has helped prevent a universal burial of oases of type Ia, those on far-out deltas, because streams and their canals contracted, leaving their oases beyond both water supply and sedimentation. Many kurgans, then, still rise above the desert for the very reason for which they were abandoned. Another set-back against burial has been warping. The region of Samarkand has been warped into a low dome about 40 miles across, through which the Zerafshan distributaries—many of them artificial—have cut their channels to a depth of 50 to 100 feet in the highest or middle part, some of them reuniting beyond. Now, it is only with canals many