

the piedmont border, through which the stream has maintained its valley. It is therefore evident that the plains have been sinking relatively to the dissected piedmont on the border. Now, the position of the valley mouth and of the alluvial shore-line on the delta is dependent on two factors—the rate of sinking on the one hand, and the rate of aggrading, that is, the rate of accumulation of silts, on the other hand.

It is also evident that as long as the rate of aggradation exceeds the rate of sinking, the alluvial shore-line will move towards the apex of the delta, carrying the valley mouth with it, and will tend to bury the dissected border; and that when the rate of aggrading falls short of the rate of sinking of the plains, the dissected border will tend to widen; that is, the piedmont valley will be prolonged outward, as the alluvial shore-line retreats to the foot-plain of the delta or to the dune-locked basins beyond.

It so happens that the Anau kurgans, standing as they do on the side of a valley that has been repeatedly aggraded and dissected, were critically situated in their relation to the zone of sinking on the one hand, and to the dissected piedmont on the other. Thus, the area occupied by the kurgans belongs potentially to the zone of marginal deformation on the one hand, and to the zone of sinking and of secularly maintained alluviation on the other hand.

Let us now apply these principles to an interpretation of the facts observed in the shafts at Anau and their bearing on the history of the successive ancient settlements. Obviously the valley on which the North Kurgan was founded was cut down when the zone of depression was sinking at a faster rate than the rate of alluviation. Conversely, the refilling of this valley is indicative of a period during which the surface of secular alluviation rose more rapidly by aggradation than the rate at which the accumulating strata beneath were sinking. In a later chapter, in treating of the cyclical character of these aggradings and dissectings of the valley and their relation to the changes of cultures, I have given reasons for assigning them to climatic changes causing secular fluctuations in the precipitation over the mountains of the highlands. In future we shall reason on the hypothesis that each cutting-down of the valleys represents a period of abnormally low precipitation, while the refilling represents a reversion to greater precipitation with more rapid alluviation.

The information that was obtained in the shafts is brought together on plate 4, in which the essential facts are represented correctly in the vertical scale, while the positions of the valley walls are necessarily idealized. During a dry period preceding the founding of the North Kurgan, a valley had been cut in the delta-plain, the surface of which dated from loess-forming time. Then came a period of increased precipitation, during which the valley was refilling, throughout the life of the oldest culture and into that of the second. During part of the second culture—the latter part of the life of the North Kurgan—there occurred a dry period, during which the valley was reexcavated. When under renewed precipitation it began to refill again, the South Kurgan was started on the west side of the valley on the original loess-plain. This growth of sediments continued till it rose higher than the previous aggrading, overflowing not only the terrace