

CHAPTER XV.—OASES.

THE OASIS AS A GEOLOGICAL PROBLEM.

MAN AS A GEOLOGIC FACTOR IN EXCAVATION, TRANSPORTATION, AND DEPOSITION, AND A DIRECTOR OF ALLUVIAL DEPOSITION.

How early man appeared in the region is a question that may never be solved, but the problem of the comparative antiquity of human records is more possible of solution. There are, geologically speaking, two kinds of human records—(1) cuttings, such as canals, trails, tunnels, wells, pictographs, rock inscriptions, etc.; (2) depositions, such as the *débris* of occupation, burials, and scattered remains. Those of the first kind, having been executed on the topography and bare rock of the land, remain where made until obliterated by erosion or burial. Those of the second kind are aggregations or single articles, of materials transported by man independent of the laws of natural transportation, and in defiance of all change beyond those of a single generation,* and are, therefore, especially subject to erosion and transportation in regions of erosion; and to erosion and burial direct, as well as redistribution and burial, in regions of aggradation. Besides all these natural changes, remains especially of the second kind may be modified or shifted by succeeding generations of man.

The immense accumulations of *débris* in cities and towns, accumulations brought together during long occupation, are of course by far the most important remains and belong to those of the second kind, deposition. It is of especial importance to analyze the structure of such an accumulation and have some understanding of the controlling factors in its growth. With the exception of a few public buildings of burnt brick in the larger cities, and a few cobblestone huts in the higher mountains, all houses in Central Asia are built of sun-dried mud. Without entering into the architecture, we may have a geologically sufficient understanding of them. The ordinary house has only one story, but a large proportion are of two, and inclose a courtyard with stables on one side. The walls vary from 1 to 2 feet thick, and each story from 7 to 9 feet high. There are three kinds of roofs: (1) those throughout the plains, nearly all flat, of mud 0.75 foot to 1.5 feet thick, laid over brush and split poles resting on beams; (2) those of the Persian or Afghan style, domes of mud without wood; and (3), those made entirely of wood and brush thatched with straw or reeds. Merv, Bokhara, Samarkand, Kokhand, and all the cities of Fergana are built with flat mud roofs, the smaller towns along the Persian frontier with mud domes, while some houses of Karategin and other places where the vegetation permits have sloping thatched roofs. Thirty years is said to be an ordinary lifetime for an adobe house with an

* Moving and shaping matter into unstable positions and shapes.