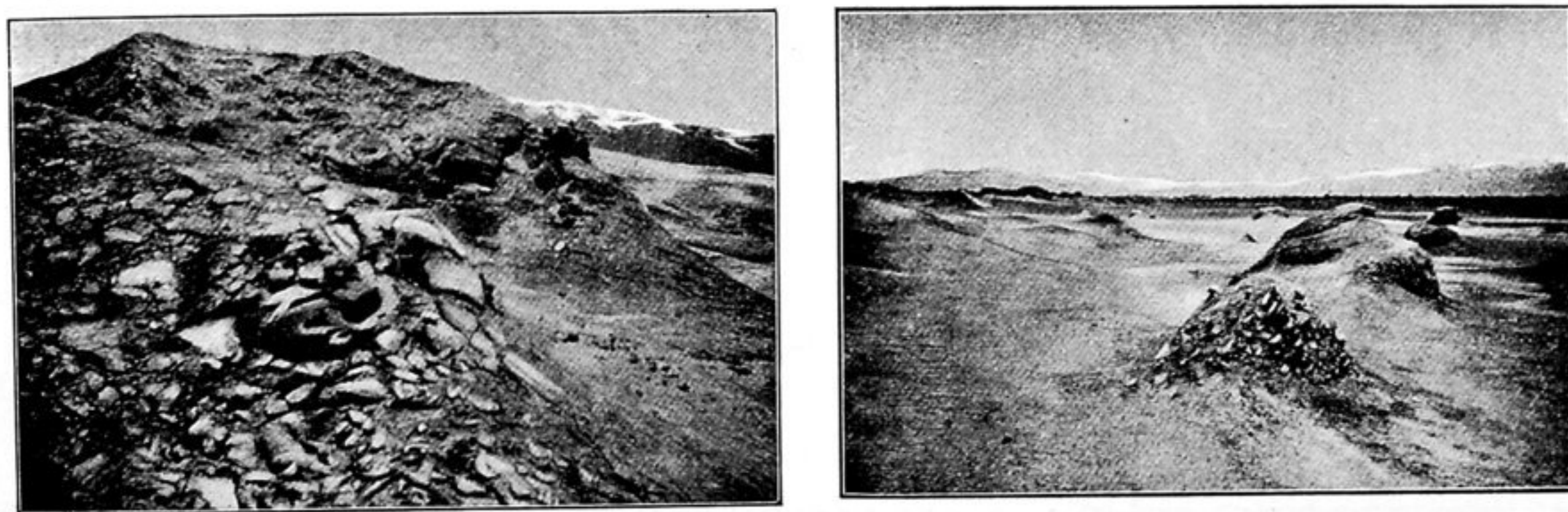


Overriding these older moraines there are later ones of fresh topography having many undrained depressions above the 105-foot level, but contoured by shorelines from this level down. No sediments were seen on these later moraines.

About 5 versts northwest of the isthmus joining the north peninsula to the mainland we had the best opportunity to study the relations of the moraines to each other and to the Kara Kul sediments and shorelines. This locality includes a portion of the long, high, frontal bluff of a later moraine overriding the smoothed-off old moraine. The second or later moraine has here reached the Kara Kul sediments overlying the first or older moraine and pushed up a distorted mass of these



Figs. 104 and 105.—Sediment pushed up by an overriding Moraine.

sediments some 50 feet high (figs. 104 and 105). Great masses of the bedded clays lie tilted on others inclining in the opposite direction. Some stand on edge, most of them are bent, and numerous small columns stand where carved out by the wind, their stratifications showing inclinations either towards or from the overriding moraine. These clays are at present very brittle.

Just to the east of this locality the coating of clays becomes thinner and in places æolian carving has exposed the underlying moraine, which, a little farther on, rises to view. On certain undisturbed surfaces of the sediments and in places on the beaches of both the old and the new moraines there are peculiar bushy concretions or growths of calcium sulphate mixed with clay (fig. 106). They stand upright, and are firmly cemented to the ground, which fairly bristles with them over considerable areas. Similar concretions were seen forming in the brine pools on the present lake shore. I am indebted to Professor Palache, of Harvard, for the analysis of these growths.



Fig. 106.—Concretionary growths of Calcium Sulphate on Moraine more than 100 feet above Lake.

From these various observations we may reason: (1) that the older moraine predates the Kara Kul sediments at this point; (2) that the deposition of at least