A Probable Origin of the Small Mounds of the Lower Mississippi and Texas Coast.

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Noting several articles "On the Origin of the Small Mounds of the Lower Mississippi and Texas," in Science Vol. XXIII (Mr. P. J. Farnsworth, pp. 583-4; A. C. Veatch, p. 35; Irving H. Wentworth, p. 819), leads me to make a few suggestions on the subject. In the region mentioned these mounds are very numerous, too numerous, it seems, to be Indian mounds, except the class of mounds mentioned by Mr. Irving H. Wentworth.

The mounds mentioned by Mr. Wentworth are, no doubt, of Indian origin. While with the Apache Indians some years ago, the writer saw several mounds of this type constructed. All these were erected not as places for sacrifice or any ceremonies of that sort, but as places for cooking the tuber-root of the *Agave americana*. In this cooking process, a shallow pit is first dug and lined with cobble-stones. A fire is then built in it and kept burning till the rocks are at white heat. Wet twigs (or grass) are then placed in a thick layer over the live coals and rocks. On these the Agave tubers, a wagon load or more, are quickly piled, and over these, after they have been covered with twigs or grass, a thick layer of cobble-stones are piled. All then is covered with wood, which is ignited and kept burning for about twelve hours, while the Indians dance around it. When the rocks are sufficiently cool, after the fire has been let die down, the top is removed and the cooked tubers taken out of this peculiar oven, packed in baskets, and taken to the distant "tepees," leaving the rockpile with an elliptical, practically flat top. Probably the mounds mentioned above were constructed for the same or for similar purposes.

Concerning the other mounds of the region, may they not be due to mudlump formation in a former geological epoch?

In an article on "The Exceptional Nature and Genesis of the Mississippi Delta," E. W. Hilgard states (Science, Vol. XXIV, pp. 861-866) that "mudlumps are now being upheaved in the channel of the lower Missis-

sippi," that "mudlump formation is at present the normal mode of progression of the visible delta into the gulf, the principal mudlumps rising immediately inside the bar, where the current excavates the river bed so as to relieve the superincumbent pressure." As to the origin of these mudlumps, Prof. Hilgard further states in substance (loc. cit.) that "in the Mississippi delta region there is an impervious blue clay bottom reaching out into the gulf for about twenty-eight miles beyond the present mouths of the river," that "superimposed on this is a semi-fluid blue clay stratum," and that "over this in the swamp-delta areas are deposited sandy bar material much faster than the former can escape to seaward under pressure. Consequently, wherever the river removes the superincumbent sandy, gravelly deposits, the pressure on the areas adjacent forces the semi-fluid clay to the surface in the form of mudlumps. Escaping gases also seem to aid in this mudlump formation."

Now the mounds of the lower Mississippi-Texas region are not likely identical with those of the delta proper in formation; but may they not have been made in a similar manner; that is, on the principle of "creeps"? If on an impervious bottom at the time the region in question was being formed, there was a semi-fluid layer reaching any distance inland, as the shore line advanced or receded, and this was being covered with another layer faster than it could creep seaward, whether the superficial layer was brought thereby wind or water, mudlumps would certainly have been pushed up in all the spots where the latter layer was thin or wanting. These, when dried, would become mounds.