

GEOLOGY AND THE INDIAN MOUNDS

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The scientific excavation of Indian mounds, together with the reading of the record which they hold, is a special field that requires of the archeologist broad training, much experience, and special technique. These requirements have become more exacting as the methods have become more refined, and the student who now anticipates a career in Indian mound archeology pursues a college and graduate curriculum of broader scope than ever before. There are those subjects which bear on human anatomy, pathology, psychology, racial origins, primitive customs and practices, religious ideas and rites, primitive occupations, methods of construction and transportation, Indian history and traditions, primitive art, identification of earth materials found in the mounds, determination of their sources, the structure and age of the mounds, and a technique of excavating, recording, and collecting that will bring results for an ultimate interpretation of the Indian record.

In the course of the excavation of the Cahokia and Illinois River groups of mounds by W. K. Moorehead and J. L. B. Taylor under the auspices of the University of Illinois, the writer has coöperated in a study of the geological aspects, and as a result has become very much interested in the application of geologic science to the study of Indian mounds.

SETTING AFFORDED BY HISTORICAL GEOLOGY

First of all, there is the historical setting of the human race in geological history. During the geological ages, which have spanned hundreds of millions of years, the life of the earth has developed progressively from primitive to highly advanced types, at least partly if not largely in response to the changing conditions of climate, physiography, oceanography, food supplies, life competition, and certain special geologic conditions. Rocks older than the Cambrian have revealed thus far no life higher than the invertebrates; the Cambrian strata recently have yielded what appears to be a part of a fish; the Ordovician rocks, definitely fish; the Mississippian, amphibians; the Pennsylvanian, reptiles; the

Jurassic, birds and lower types of mammals; the Eocene, generalized mammals; and the late Pliocene or early Pleistocene, man.

Europe and Asia have furnished many evidences of early man, and where these have been found in glacial outwash gravels or in caves where they have been preserved by travertine deposits, they are a subject of common conversation among the local residents. The fact that America has not as yet yielded undisputed evidence of Pleistocene man should make the glacial geologists examine very critically the upper surface of buried interglacial soils for such evidence. In many places in Illinois, Iowa, and adjacent states, these old soils very clearly show places where subsequent invading ice-sheets left the very top of the old soil undisturbed, and places where the late Pleistocene loess covered old soil, only to be uncovered by erosional and artificial excavations.

Furthermore, workmen operating gravel pits in the outwash valley trains of the glaciers should watch for evidences of man, either fragments of his skeleton or artifacts, and report them to the glacial geologists of the State or Federal surveys or University faculties while they are still in place, before the stratigraphic evidence of their natural entombment is destroyed. The geological profession of this country, the writer feels, has been neglectful in interesting the laymen and school children in earth history, and as a consequence there is little foundation as yet for geologists to build on in trying to interest the uneducated. The less the attention paid to conserving the evidences of early man in America, the more hopeless the case of trying to uncover his record.

THE PROBLEM OF DETERMINING THE AGE OF THE INDIAN MOUNDS

All of the mounds in Illinois which contain no European culture and which occur on valley floors that are degraded below the surface of the Wisconsin valley trains are obviously older than the European human invasion of North America and younger than the last glacial epoch. The lack or small amount of erosion of the gulley type on their slopes, together with the depth of the virgin soil profile that is found on the mounds, shows that while the mounds may be several hundred years old, they are geologically very recent, perhaps not a thousand years old. Indeed, the shallow character of the soil and weathering zone which passes over the mounds confirms this conclusion.

But it should not be taken for granted that all of the mounds are so recent. A comparison should be made of the soil profiles which pass over the mounds, the depth to which they have been developed and the amount of secondary mineral substances which have been formed. In making this comparison, consideration and evaluation of several factors are necessary: angle of slope, texture and porosity of the material, the character of the native vegetation—whether prairie grass or forest, the size and form of the summit area, the height of the mound, and the composition of the original earth materials. The mounds which show the deeper weathering, other things being equal, are the older, and their content of artifacts should show a corresponding difference from the others, though not necessarily a more primitive culture.

The Cahokia mounds, so far as examined, and the Ogden and Dixon mounds, near Sepo, all show soil profiles in their infancy of development. Weathering has scarcely proceeded to any perceptible depth, charcoal and calcareous material are found close to the surface, and there is almost no separation into the various horizons so characteristic of the older drift materials. In contrast, the soil profiles which were found to pass under one of the Cahokia mounds—the only one opened to sufficient depth—and the Ogden mounds, show a very much more intensive and deeper development, with variation in color due to varying degrees of oxidation, and with secondary pellets of iron oxide.

The Dickson mound on the bluff of the Illinois River is on a deposit of loess which has been but little weathered, and so the mound is geologically very young, probably less than a thousand years.

STRUCTURE OF THE MOUNDS

There are great structural differences in the various mounds, showing that they were built differently. The Sam Chucallo mound of the Cahokia group was first a low mound in which burials were made, and then later built and rounded over to a height of about ten feet—a very simple type. The James Ramey mound of this same group showed several stages of construction: there were at least two very definite streaks of dirt running through the mound at different levels. The dirt streaks were clearly not true soils, simply surfaces which had been used for a time before the mound was built higher. In other words, the mound had a tabular summit at two stages of its construction, and finally it was rounded over into a cone.

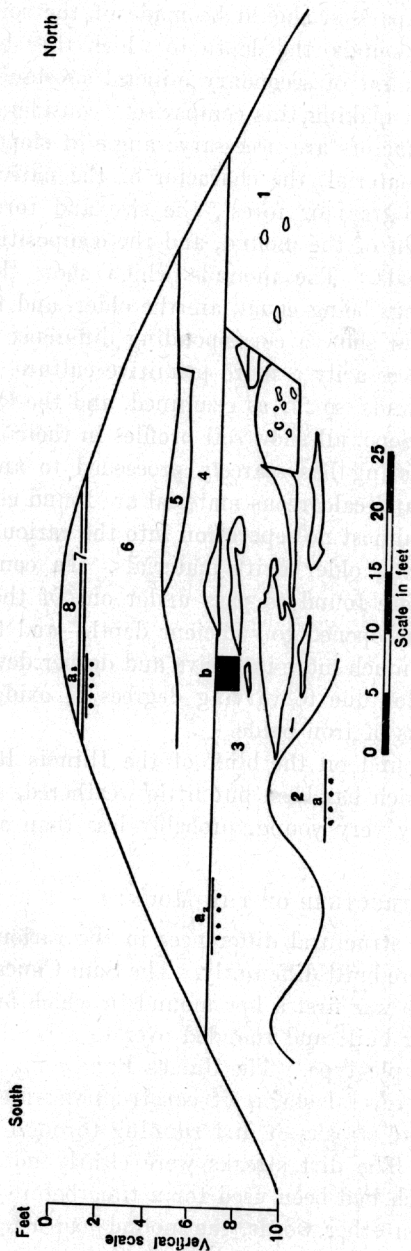


Fig. 1. Diagrammatic sketch of the west face of the James Ramey Mound. The letters *a* represent the sites of bonfires on old surfaces, marked by two well-defined dirt-streak horizons. For further details see "The Canokta Mounds," University of Illinois Bulletin, Vol. 26, No. 4, pp. 125-127, 1929.

The Ogden mound which has the residence on its summit shows a still greater complexity of design and construction. Tunneling has disclosed log tombs, later covered over with earth until its original summit reached a height several feet higher than the present mound. White man has since reduced it and extended the mound laterally with the material obtained, making the summit wider. Near the base of the mound, about $2\frac{1}{4}$ feet above the old soil, the Indians spread a thin layer of sand before building the remainder of the structure, which is too complex to be adequately described in this paper. In places the silty clay is stratiform, that is, in crude thin layers, as if the material had been carried in baskets and spread out by hand. In other places the material is lumpy and of different colors of yellow, rusty-brown, drab, and



FIG. 2. The Ogden Mound at Sepo, Illinois. (Photograph by Applegate.)

light-gray, as if it had been intimately mixed before it was placed. In still other places the material is loose and lumpy as if it had fallen into a small room.

The Dickson mound on the bluff was primarily a burial mound, with but little excavation to start with, and then additions of loessial material were made from time to time as other bodies were superimposed. The burial groups of this mound, including children as well as adults, suggest that this was built during a pestilence.

Mounds which show, by their structure, different stages of building deserve special attention in the collecting of artifacts, particularly if there is any suggestion of a changing culture between the stages.

KINDS AND SOURCES OF MATERIALS USED

The identification of the kinds of materials used, and their sources, is very important. In the main they are soil and sub-soil materials obtained nearby, but in special instances a small quantity of material may be found in the mounds which had other sources, as for example, the fireclays of the Coal Measures or the

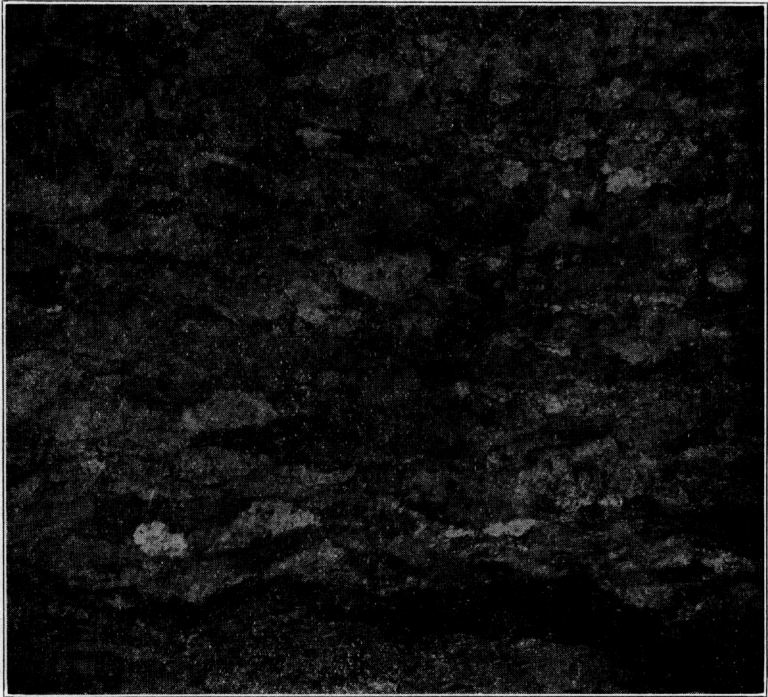


FIG. 3. View of wall in a tunnel through the Ogden Mound, showing the mottled effect of the intimately mixed clays of different colors. (Photograph by Applegate.)

bluff loess of the region. Fragments of travertine are found scattered through some mounds, suggesting that they were taken from some prized spring. In other cases special kinds of rock materials other than native copper may be found which, if the source can be located, may carry special significance.

RELATIONSHIP TO PRESENT OR ABANDONED
STREAM CHANNELS

The location of mounds on water courses has an obvious significance. Some mounds are considerably removed from present channels but are on old deserted channels, suggesting that there has been a change in river courses since the mounds were built. Other mounds have a topographic position high up on bluffs, or considerably away from valleys. The purposes for which these were built might well have varied from those along the channels, and likewise their cultural contents.

The foregoing discloses that there are some aspects of Indian mounds of interest to the geologist, to the interpretation of which geologic science may contribute. The historical geologist in particular is anxious that the history of the earth and its inhabitants be completely deciphered and carried down to the present, and the development of the inorganic world and the organic world properly placed in time perspective. The preservation of the record of early man, whether glacial or recent, is bound to be of increasing value as the mass of people catch this perspective.