FOSSIL BONES AND ARTIFACTS AT FREDERICK

CHAS. N. GOULD

FOSSIL BONES of prehistoric animals were discovered in an old stream gravel bed near Frederick, Oklahoma, nearly two years ago, as discussed in my paper before the Academy last year. Later human artifacts, including metates, arrowheads, and one bead, have been reported, and a number of leading scientists have visited the locality. There has been some discussion as to whether the artifacts were actually found in place associated with the bones, but during the past year some new evidence has come to light. Doctor Oliver P. Hay, authority on Pleistocene vertrates, claims the bones are of Aftonian age. If the artifacts have been found associated with the bones in undisturbed gravel, and Dr. Hay's identifications are correct, it means that man has lived in America much longer than has generally been believed.

A year ago I presented at the meeting of the Academy a short paper describing the occurrence in the gravel beds near Frederick, Oklahoma, of certain fossil bones and human artifacts. The object of the present paper is to record very briefly the progress of investigations in that region during the past year. In order to present the matter intelligently, however, it will be necessary to review certain statements made last year.

Tillman County, Oklahoma, of which Frederick is the county seat, borders on Red River. Near the southwestern corner of the county North Fork of Red River empties into the South Fork which is usually considered the main stream. In general, the surface of Tillman County is flat and level and dissected by shallow stream valleys. The rocks on the surface in all of the eastern part of Tillman County consist of Permian red beds, being shales and thin sandstones. In the western third of the county, the red beds are covered with deposits of sand and alluvium, presumably of Pleistocene age. The town of Frederick is located a few miles west of the center of the county.

Starting at Frederick and running north for a distance of eight or ten miles is a low, flat hill which stands in places 80 to 100 feet above the level of the plain to the east. Near Frederick this hill averages a half-mile wide. To the north it grades out and merges into the sandy plains. Streams rising on the east flank of this hill flow eastward, and many of them have cut rather deep gullies into the red shales. In general, the hill has a rather prominent east-facing scarp, but to the west it merges into the sand hills.

The top of this hill is covered with deposits of sand and gravel to a depth of as much as fifteen to twenty feet. This gravel has all the appearances of being ordinary stream gravel such as occurs in very many places throughout Oklahoma and adjoining states. It is typically cross-bedded and does not differ either in character of sedimentation, or in materials, from other stream gravel throughout the country. The pebbles, varying in size from fine through coarse sand and small gravel up to fragments as much as three inches in diameter, consist for the most part of granite, gabbro, quartzite, hard limestone, and other materials which are found in the Wichita Mountains thirty miles or more to the north.

Most geologists who have visited the region believe that the gravel deposits represent the material carried by a prehistoric stream from some unknown source to the north, and that the materials now making up the gravel beds had their origin, in part at least, in the Wichita mountains.

If this is true, it is obvious that the deposits which now occupy a position on top of the ridges were at one time in the bed of a stream and that this stream ran in a valley. Since this occurred, erosion has cut away the red beds and has denuded the country to the east of the ridge to a depth of from 80 to 100 feet below the level of the gravel beds which now occupy the highest points in the region. It is probable that the gravel bed formed a protective covering preventing erosion and is in this sense the origin of the hill.

For a number of years the gravel along this ridge has been quarried and used for a variety of purposes, such as road material, concrete, for building purposes, and the like. The man who owns the quarry nearest to town is Mr. A. H. Holloman. Something like two years ago he began to find bones in the gravel beds. Attention of the Scientific American was called to these bones and Mr. J. H. Figgins and Mr. Harold Cook of the Colorado Museum of Natural History at Denver visited the quarry and carried away a number of these bones. In addition to the bones, however, there were secured at this place several human artifacts, consisting of metates or grinding stones, and arrowheads. Mr. Holloman says that seven metates have been found, but, not recognizing their importance, two of them were thrown into the dump and have been buried. Five of them are now at the Denver museum.

The arrowheads which were found more than a year ago were also taken to Denver and have since been sent to the Museum of Natural History at New York. Mr. Holloman also says that a bead was found in this gravel bed, but that it has been lost. He described the bead as being about one-half inch in diameter with a hole bored through the center, and from his description, one may infer that it was most probably a fresh water pearl.

During the past two years a number of scientists have visited the locality, among whom is Oliver P. Hay of the U. S. National Museum at Washington, who is usually considered our best authority on Pleistocene vertebrate fossils. Doctor Hay, after having examined all the evidence, issued a statement to the effect that in his judgment the fossil bones represent the Aftonian or first interglacial epoch. This is of extreme interest and importance, for if it can be demonstrated that the artifacts were found in the same undisturbed gravel bed with the bones, and the bones are Aftonian, it would place the advent of man in America back a very long period of time.

Last year four people from the University of Oklahoma, namely, Professor Leslie Spier, head of the department of anthropology, Professor C. E. Decker, paleontologist, Lois Gould, and your speaker, visited Frederick and succeeded in finding a considerable part of the carapace of a glyptodon. This was imbedded in plaster and brought to the University of Oklahoma.

The paper which I read last year set forth the facts as heretofore renumerated. Professor Leslie Spier read a paper at the same meeting in

which he said he stood in the light of a "conscientious objector" to some of the statements. He called attention to the fact that no scientist had seen the artifacts in place and for that reason he emphasized that great caution should be used before accepting some of the statements made. Several articles have appeared during the year, especially in Science, by Doctor Spier, Doctor Hay, and other writers regarding these finds. In one of these articles, Doctor Spier, after having examined the metates in the museum at the University of Denver, stated that according to his belief they were doubtless of human origin.

During September of the present year, Mr. Holloman found another arrowhead in the undisturbed gravel. It occurred about thirteen feet below the surface and perhaps four or five feet from the base of the gravel. This was photographed in place by Mr. A. H. Kraus of Frederick, and a short time later Professor Spier, Professors A. O. Weese and A. I. Ortenburger of the department of zoology of the University of Oklahoma, and your speaker again visited Frederick. The arrowhead had been removed from the gravel, but the place where it was found had been prserved intact. All four of the scientists present agreed that it was their judgment that the arrowhead had been found *in situ* in the undisturbed river gravel.

During the past year additional bones have been found in this gravel bed and have been identified by Doctor Hay. The list of bones as discovered up to the present time is as follows:

Three extinct horses, one new species.
Megalonyx, ground sloth.
Mylodon, ground sloth.
Glyptodon.
Tapir.
Peccary.
Llama, new species.
Camel.
Two mastodons, one new species.
Three elephants, one new species.
Soft-shelled turtle.

The human artifacts include:

Seven metates, five preserved.
Three arrowheads.
One bead, lost.

The finding of these human artifacts with associated bones at Frederick, taken in conjunction with the finding of arrowheads in undisturbed materials underneath the bones of prehistoric bison near Folsom, New Mexico, and the finding of similar remains near Colorado, Texas, are of extreme interest to the geologist and archaeologist. These findings all seem to point to the same general conclusions, namely, that the advent of man in America was much earlier than has heretofore been believed.