PROBABLE HISTORY OF THE HOLLOMAN GRAVEL PIT AT FREDERICK, OKLAHOMA

(Abstract)

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A study of the gravel of this pit has led some scientists to think that man was present in North America early in the Pleistocene.

A study of the gravels shows the following:

1. They are gravels which were laid down in a stream.
2. This stream did not originate in the Wichita Mountains, but came from farther west, as the North Fork of the Red does at the present time.
3. The lower materials were deposited by a stream that at first was fairly swift, but later had its velocity slowed down until it carried mostly sand. The velocity was then rather suddenly increased and coarse gravels were deposited. The stream then left its channel and there has since been deposited a few feet of fine soil which was probably mostly laid down by wind.

A study of the region shows:

1. That the ridge on which the gravel pit is found extends northwest to about where Otter Creek appears to once have joined the North Fork of Red River. To the south the ridge soon ceases. Farther south there is a short tributary of Red River where the ridge probably formerly existed.

2. The present lower course of the North Fork of Red River is a few miles west of the ridge and about 200 feet lower. It has every appearance of being the course of the old stream that committed piracy on the stream which laid down the gravels of the Holloman pit. In other words, the Holloman pit was probably deposited by what was once the North Fork of the Red.

3. A post-Pleistocene uplift of 70 to 100 feet occurred over western Oklahoma.

4. At many places in western Oklahoma at 70 to 100 feet above the present stream beds, sand and gravel pits are found which contain fossil remains that are in general like those found in the Holloman pit.

A study of the fossils of the Holloman pit shows:

1. That Cretaceous shells and Tertiary and Pleistocene bones are present, most of these are in the gravel, but some in the sand below. Metates have been found in the gravel, and arrow heads that appear to be of recent make have been found in both the gravel and the sand.

2. No articulated skeletons have been found.

3. Some of the bones show heavy wear as though they had been transported a considerable distance. Most of the bones show little if any wear. Also one of the arrow heads looks as though it had been worn by water transportation.

From our studies of stream action, we know:

1. That deposits made by a stream in its bed are very unstable and are subject to being worked over at any time, as long as the stream remains in the same valley. They have not the stability of marine deposits whose age can be safely told by study of fossil content.

2. Rate of erosion varies much in different areas. Conditions of climate and soil are very favorable for rapid erosion in the area under consideration. It is probably very much more rapid than for the Mississippi river valley as a whole.

Conclusions:

1. If we assume that the materials of the Holloman pit were all laid down together and have not been disturbed since then, we can safely say that the arrow heads and metates are of early Tertiary and perhaps of Cretaceous age.

2. If we assume that the materials of the pit have been disturbed, then we have to say that its age goes no farther back than the time it was last worked over by the river.

3. If the pit has been worked over the metates and arrow heads themselves carry as much evidence as to the age of the deposits as do the animal remains.

4. Considering the gravels, the condition of the included fossils and artifacts, and the geology of the region as explained above it seems reason-

able to assume that piracy was committed by the stream to the west some time after the post-Pleistocene uplift, thus leaving the old stream bed dry in which the gravel pit is found. The surrounding region had been pretty well eroded down before this occurred. Soon after the uplift when the waters of the old stream were flowing rapidly and laying down the gravel layer of the Holloman pit, a gravel pit a little farther up the stream than the present one was undercut and redeposited. This deposit contained the Cretaceous and Tertiary fossils now found in the Holloman pit, while the arrow heads and metates were on the surface where they had been left a comparatively short time before, and all went into the river together.