

Proceedings of the Iowa Academy of Science

Volume 32 | Annual Issue

Article 57

1925

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Recommended Citation

Lees, James H. (1925) "Stone Axes from Adel," *Proceedings of the Iowa Academy of Science*, 32(1), 331-338.

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STONE AXES FROM ADEL

JAMES H. LEES

Last fall (1924) while a workman at the plant of the Adel Clay Products Company was digging a trench at the south edge of the shale pit he uncovered three stone objects having the general shape of so-called Indian axes. During the following winter Mr. H. R. Straight of the Company while in Washington, D.C., took the two smaller stones to the Smithsonian Institution and submitted them to inspection by Drs. J. W. Fewkes and Neil M. Judd. They pronounced them to be genuine artifacts and requested Dr. J. W. Gidley of the National Museum to go to Adel and examine the locality at which the artifacts had been found. Doctor Gidley asked the writer to accompany him, a courtesy with which he was glad to comply. The visit to Adel was made on April 4, 1925, and at that time Mr. Straight showed us the three objects and took us for an inspection of the shale pit. The writer also visited the pit on May 2 and made a further study of the deposits.

The two smaller axes are dark gray diorite and the rock fragments evidently were formed by the splitting of a single piece of rock, as the two pieces will still fit together along what must have been their cleavage plane. They are about eight inches long and three inches wide. One piece is nearly three inches thick while the other has a thickness of a little over an inch. Both have been worked down to fairly good edges and both show the circumferential grooves for attachment to handles.

The third object is gray granite with a large commingling of the dark ferro-magnesian minerals, is about twelve inches long, seven or eight inches wide and four or five inches in maximum thickness. From this it tapers to a thin edge in the lower part. A few inches from what may be called the upper end is a seam of feldspar which extends entirely through the mass at nearly a right angle to its length and stands out from the general surface. The features of this specimen give it the appearance of a stone ax but it seems much more probable that it is simply a weathered piece of granite which was, perhaps, made use of by the aborigines who shaped the other objects.

The three specimens were found in sand near the base of an old valley filling and twenty-four feet below the surface of the ground.

The bed rock in this region is Pennsylvanian shale of the Des Moines series. This is the material which is being dug for use in the clay works. Overlying the shale is mantle rock of Pleistocene age. The locality lies within the area of the Wisconsin drift sheet, hence the surface clay is Wisconsin till, which is characteristically yellowish in color, with many pebbles, including a high percentage of limestones. This till is well exposed in the stripping just west of the present pit, and here it overlies a long lens of sand and gravel. Beneath this in turn is dark gray till, which lies on the shale. This lower till was not seen in place and whether it is of Kansan or Wisconsin age was not determined, hence it is not known whether the sand lens is interglacial or Wisconsin. These facts are mentioned because it must be understood that this sand lens is not to be connected in any way with the sand in which the artifacts were found.

The locality where the stone axes were found was at the south edge of the pit in a cut made primarily for a grade for the railway on which shale is carried from pit to plant, and later being widened by stripping to expose more shale. The stream flows at the south edge of this cut and the walls of the cut are increasingly higher from creek to pit, a distance of perhaps 100 yards. The cut was all in clay nearly to the edge of the pit, where shale rose in the walls, with a very steep slope on the east wall, with a gradual grade in the west wall. The material in the east wall could not be examined very well as it was slumped and covered with waste which had been dumped on it, but the west wall was more distinct, as the steam shovel was working on it. The material of this west wall was all alluvium, black or very dark gray, and rose to a height of twenty-four feet above the floor at the angle where this cut intersected the older stripping in Wisconsin till. Where the wall curved in to meet the narrower railway cut the material was a lighter gray alluvial clay and graded in its lower part into sand, which occupied all the lower part of the exposure at the point of junction with the narrow railway cut. In some places the alluvium and sand extend five feet or more below the floor of the cut; at the point just mentioned sand extends about a foot below the floor. It was just at this point that the artifacts were found, according to the story of the workman who found them, standing vertically in the sand a foot above the base of the fill, one small ax on either side of the

larger ax-shaped granite mass. These relations are shown in the two views which accompany this paper.

Immediately under the sand in which the axes were found was a few inches of fire clay which had slid or been washed down from the near-by shale bed. Under this fire clay is a mass of wood some of which is still fresh and undecayed as it had been buried quite out of reach of the air. Some of this wood may be seen near the spade in the lower part of the general view. Below the layer of wood and fine sandy clay which surrounds it is a layer of small boulders which evidently was the bottom of the creek bed as it lies on undisturbed red shale.

Now the relations of the alluvium and sand to the other materials form the peculiar feature of the locality, geologically. In the railway cut, as already indicated they were banked against Pennsylvanian shale, farther west they must lie against unmoved Wisconsin till. The sand lens under the till pinches out a little farther northwest and is not connected with the alluvial material. The alluvium and sand evidently fill a valley which was cut into Pleistocene till and Pennsylvanian shale either by the present stream or by an ancestral stream and then filled, at first with sand, later with alluvium. The peculiar thing about this is that the alluvium rises fifteen or twenty feet above the present stream. The whole locality is nearly at the upland level, the stream is only a small creek with low gradient and a very narrow flood plain and there is no evidence that there could have been very extensive slope wash or any rapid transportation of waste by the creek. The Wisconsin till in the west part of the stripping forms an upland ridge and the alluvium in the south part seems to be banked against it and therefore lies at the very edge of what flood plain there is, and rises nearly to the upland. The present stream is flowing on shale where the railway crosses it.

As to the age of the valley and its filling the only definite statement that can be made is that it is post-Wisconsin. Whether the valley was formed immediately after the retreat of the Wisconsin ice is not determinable although of course it is a possibility. If it was cut then the excavation may have been made rather quickly as there would be a large flow of water from the retreating glacier. If the valley was cut at a later date it may have required a longer time. When the filling of the valley began it doubtless proceeded rather rapidly for a time, as the first material to be deposited was sand. Then when the stream began to lay down more and more alluvium filling would proceed much more slowly. It seems evident from the factors enumerated that the whole

process including the filling of the old channel and the changing of the stream's position to a location 100 yards away and say twenty feet lower than the level of its former flood plain (if this be the original stream) must have occupied a long time. If the retreat of the Wisconsin ice be placed 10,000 years ago the filling of the valley and subsequent events may conceivably have occupied a large part of that period of time; if 50,000 years have elapsed since the ice left the same statement may be made. The significant fact is that the artifacts were near the base of the filling, and must have been placed there in the early stages of the building of the flood plain.

The courtesy of the Bureau of Ethnology of the Smithsonian Institution in consenting to the publication of this note is gratefully acknowledged. The writer also wishes to acknowledge the intelligent interest of Mr. Straight in recognizing the value of the find and his courtesy as shown in his cordial reception to Doctor Gidley and the writer and his assistance in the carrying on of their study at Adel. Mr. Straight also had photographs made of the locality and placed the axes as nearly as possible in their original position. Two of these photographs are reproduced here by Mr. Straight's kindness.

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Lees: Stone Axes from Adel

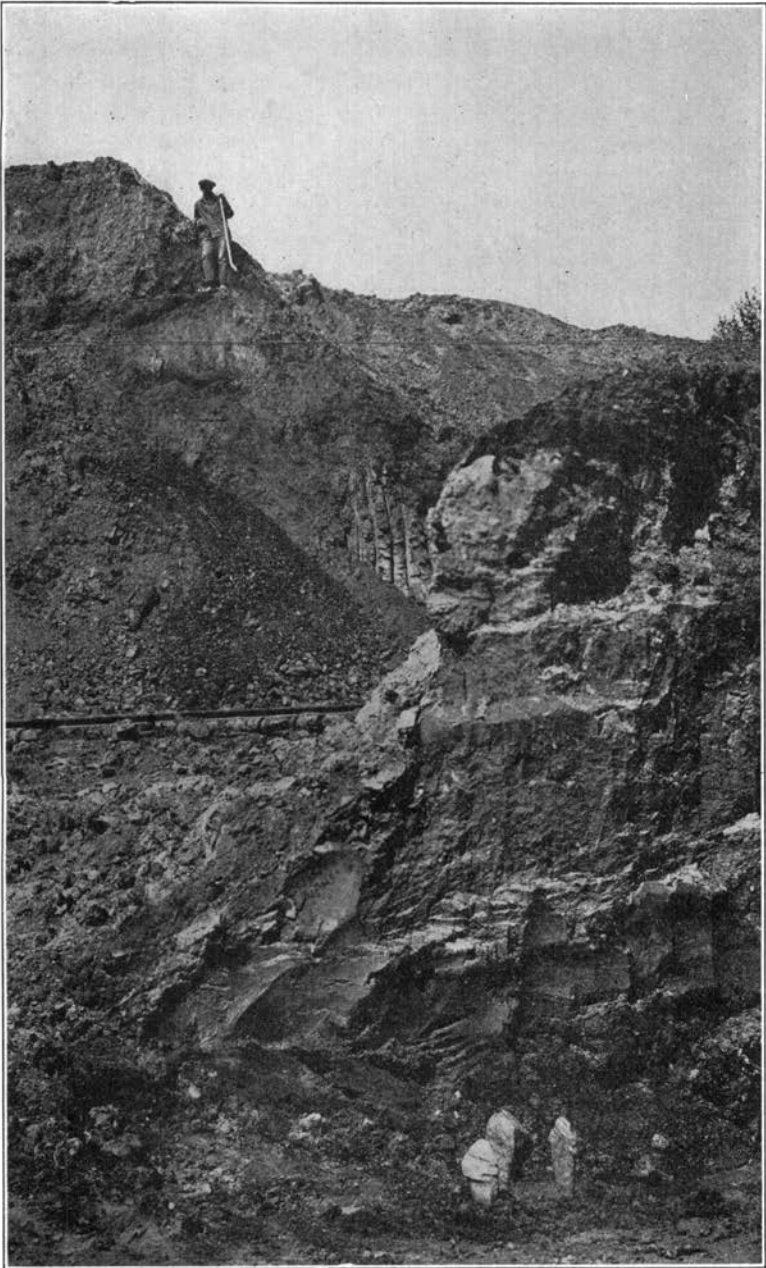
EXPLANATION OF PLATES

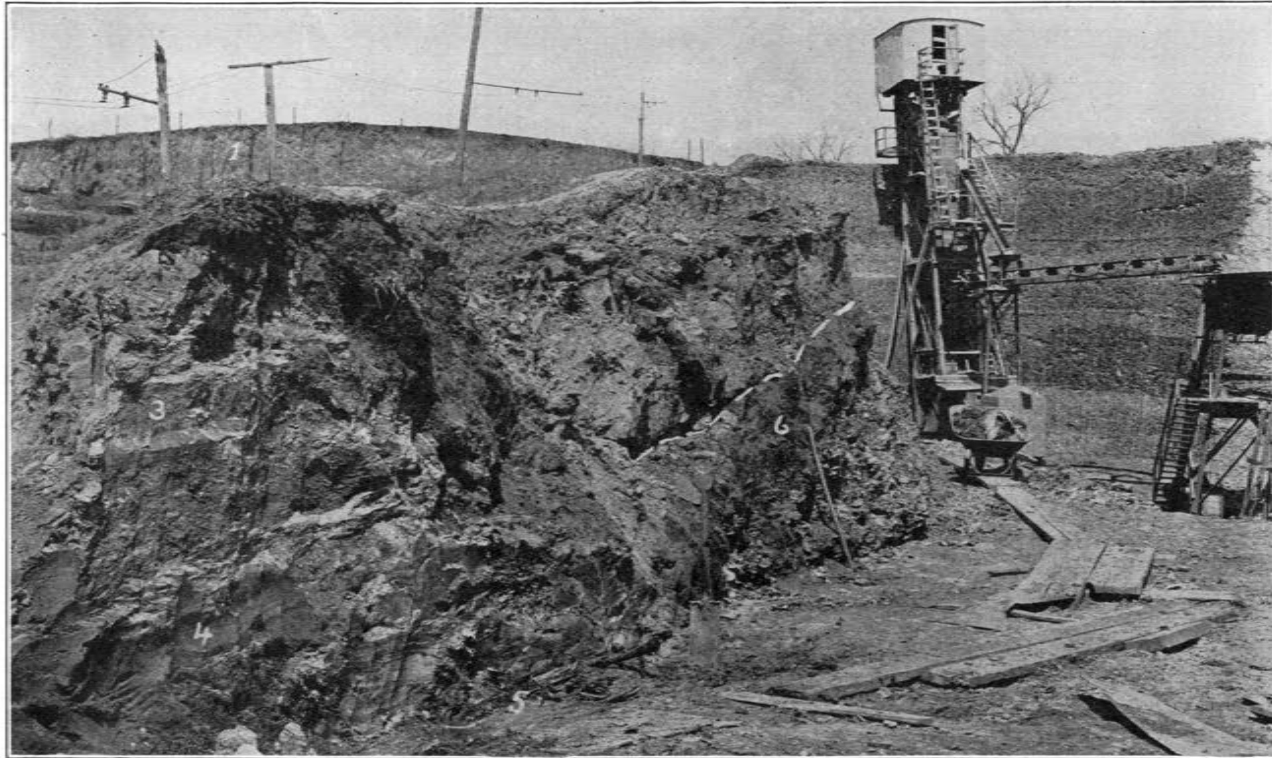
Plate I. General view of pit of Adel Clay Products Co., Adel, showing position of stone axes as found in stripping. 1. Wisconsin till. 2. Sand and gravel lens. These are 100 yards or so west of the cut in the foreground. 3. Alluvium, black or dark gray fine sandy clay. 4. Sand bed in which the axes were found, approximately as shown here. 5. Wood fragments from a layer under the sand and washed-in fire clay. 6. Shale in place. The material above the broken line is secondary. 3 and 4 represent a thickness of about four feet. The filling extends about a foot below the present excavation, where the axes are placed, and rests on shale.

In the right background is the shale pit with planer for winning the shale.

Plate II. A view of the stripping at the pit of the Adel Clay Products Co., Adel. The material above the horizontal line at the level of the man's feet is waste which was dumped from earlier stripping. The horizontal line represents the original surface level and below that to the level of the track is alluvial valley filling, black or dark gray sandy clay grading into sand near the base. The material in the background was originally continuous with that in the foreground. The latter is the same as the left hand part of plate I— alluvium above and sand below. From the original surface to the level of the axes is a vertical distance of twenty-four feet.

STONE AXES FROM ADEL





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PLATE II