JOURNAL OF THE TENNESSEE ACADEMY OF SCIENCE

VOLUME 50, NUMBER 4, OCTOBER, 1975

# DARKS MILL LOCAL FAUNA (PLEISTOCENE: WISCONSIN), MAURY COUNTY, TENNESSEE

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## ABSTRACT

A Pleistocene water-hole near Darks Mill, Maury County, yields a variety of vertebrate fossils.

## INTRODUCTION

Fragmentary remains of turtle, mastodon, ground sloth, and other mammals occur in Pleistocene sediments near Darks Mill, Maury County, Tennessee. Fossils come from depths estimated at 32 to 35 feet in an open-pit phosphate mine operated by the Pressnell Phosphate Company for the Monsanto Chemical Company. The co-occurrence of mastodon (*Mammut americanum*) and giant ground sloth (*Megalonyx jeffersoni*) establishes a Late Pleistocene (Wisconsin) age for fossiliferous sediments. In terms of absolute time, these organisms probably lived 10,000 to 35,000 years before present.

Though few species are known from the Darks Mill site, they seem to merit classification as a Local Fauna (Hibbard, 1958). They represent a variety of environmental adaptations and the association of fossils can be interpreted in ecologic terms.

## SITE

### *Location*

The Darks Mill property of the Monsanto Chemical Company is located about 0.7 miles north-northeast of the small community of Darks Mill in northern Maury County, Tennessee. It lies about 400 feet west of Carters Creek Road, some one-half mile north of the junction between Carters Creek Road and Darks Mill Road. The site is in the east central portion of the Godwin 7½ minute topographic quadrangle and within the Godwin-Darks Mill area of the Columbia phosphate district. Regional geology is described by Smith and Whitlatch (1940).

### *Sediments*

In the Darks Mill pit, four types of sediment occur: soil, reddish brown muck phosphate ore, yellowish gravelly sand, and dark clay (Figure 1). The last two sediment types are low in phosphate and are, apparently, unique to the Darks Mill pit. When these unusual, low-phosphate sediments were encountered, mining ceased. The portion of the pit with unusual sediments was then backfilled. Later, fossils were observed on spoil banks when differential weathering caused some of them to stand in bold relief. All specimens discussed in this report were collected from tailings adjacent to the pit.

Though fossiliferous sediments were not observed *in situ*, enough is known to permit a diagramatic sketch of local stratigraphy (Figure 1). Throughout the Darks Mill property brown phosphate ores are predominantly reddish-brown "muck", a clay-rich sandy residual deposit akin to lateritic soils. Within the muck there is an abundance of platy bodies that are very rich in phosphate and lend a pebbly texture to the deposit. Ideally, ore averages over 50% bone phosphate of lime ($Ca_3(PO_4)_2$).

Soils of the Darks Mill region have most of the characters of muck ore but are not rich enough for economic extraction. In the Darks Mill pit roughly the upper 20 feet of the sedimentary sequence is stripped away. Lower materials, with a higher phosphate content, are extracted. There is a transition from soil to ore and the inexperienced eye cannot make a reliable differentiation. Phosphate ore extends to variable depths, often over 40 feet, and lies on a buried karst terrain with numerous pinnacles, fissures, and sinkholes.

Fossiliferous sediments were excavated from a barren zone where soil extends to depths of more than thirty feet and where there is no development of muck ore. Each discovery of fossiliferous sediment resulted from an attempt to dig through the thick soil overburden and reach ore. Chocolate to gray-black clay is the most lithologically distinct fossiliferous sediment. It was encountered under some 32 feet of soil. In an attempt to dig through the clay one further bucketfull was removed. When it was clear that the clay had significant thickness, that part of the pit was abandoned and backfilled. Examination of spoil banks suggests that all of the excavated material was fossiliferous. Thus, the horizon must be at least two to three feet thick. The Monsanto Chemical Company ran an analysis on this material. It is about 70% $SiO_2$ and has over 11% loss on ignition. The loss on ignition is evidence of a high organic content. Most of the clay has megascopically visible carbon concentrations that range from poorly preserved leaves and plant stems to problematic leaves to black zones without discernable organic structure. In all chemical and physical characters the clay is distinctly different from both soil and muck ore.

The yellowish gravelly sand is less distinctive. Like the muck ore, it contains aggregates of high phosphate content and the two are quite similar in texture. Both probably grade into the same phosphate-rich soil. Though no chemical analyses were made, the yellow sediment seems to have a higher concentration of hydrated iron and a lower concentration of phosphate than the adjacent muck ore. Locally yellow sediments also contain an abundance of vertebrate remains, primarily ivory fragments. Yellowish sediments were first encountered under 30 to 32 feet of soil. In an attempt to dig through this low-phosphate lithology, excavation continued to a depth of about 35 feet. Careful inspection of spoil banks suggests that only the lowest stratigraphic interval, about 35 feet below the surface, is fossiliferous.

## RESULTS

### *Fossils*

Both plant and animal fossils are abundant in the clay. Animal remains are well preserved, but plants are so poorly fossilized that they are not identifiable. Only animal fossils occur in the lighter, coarser sediments and they are too fragmentary for precise identification. All fossils that can be approximately identified are discussed below.





*Turtle.* A hundred or more fragments of turtle were collected from the clay horizon. Most are elements of plastron and carapace but a few rib fragments and bones from the limb girdles also occur. Most carapace segments show parts of a canal network. These are interpreted as parts of the low-vaulted shell of some unidentified genus of snapping turtle. A few thin fragments with rough surfaces are not interpretable as snapping turtle. Though there are not enough specimens for certain interpretation, they resemble soft-shelled turtle more than any other group.

The association of snapping turtle with fine grained, organic-rich sediments suggests subaqueous accumulation of the dark clay. Further, since scores of perfectly preserved turtle fragments occur, with no signs of post-mortem wear, articulated turtle skeletons may occur in the undisturbed clay.

*Sloth.* The distal portion of the right humerus of a giant ground sloth, *Megalonyx jeffersoni*, is the largest of several sloth fragments collected from the dark clay horizon. Sloth does not appear to occur in the yellow gravely sand.

*Mastodon.* The American mastodon, *Mammut americanum* is definitely known from the dark clay facies. All bones seem to be derived from the same individual, an infant or very young juvenile. The vetrebral centra are not completely ossified and milk dentition is present.

Hundreds of ivory chips occur in the yellow gravelly sand. The largest fragments are about five inches long and they are not identifiable to genus. They could come from the tusks of either mastodon or mammoth. Mastodon seems the more probable source. The two genera of Ice Age elephants had very different environmental needs (Aquirre, 1969). They do not normally occur together and mastodon is known from the adjacent dark clay.

*Other Fossils.* Most of the bones from the dark clay can be reasonably identified as either turtle, giant ground sloth, or mastodon. Fossils from the yellowish gravelly sand are more difficult to interpret. With few exceptions, they are fragments under five inches in maximum length. Nothing can be definitely identified.

## DISCUSSION

The yellowish gravelly sand lacks plant fragments, well preserved fossils, turtle remains, and carbon con-

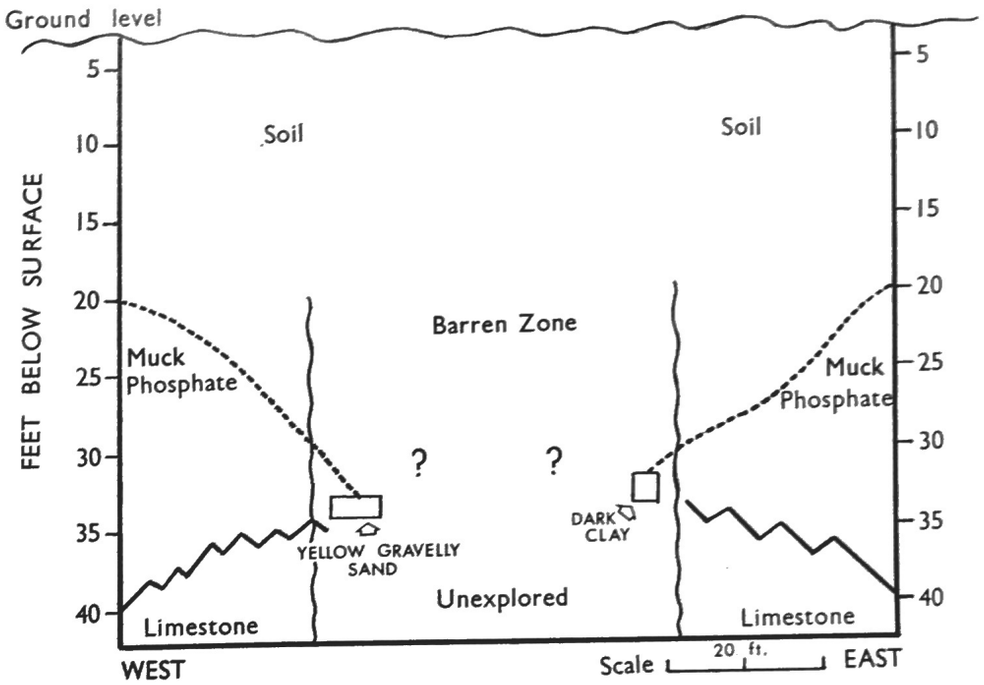


FIG. 1:

*Approximate stratigraphic relationships in the north wall of the Darks Mill pit. The central region is a barren zone that was not explored. The contact between muck phosphate ore and soil is gradational.*