

FOSSIL WHALE DISCOVERY AT THE
ALVIN W. VOGTLE ELECTRIC GENERATING PLANT,
BURKE COUNTY, GEORGIA

by

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INTRODUCTION

On May 27, 1983, the Department of Geology at Georgia Southern College was notified by Dr. Earl Shapiro of the Georgia Geological Survey that what he believed to be a fossil whale skeleton had been uncovered during construction of the water intake structure at Plant Alvin W. Vogtle Electric Generating Plant in Burke County, Georgia (Fig. 1). In response to Dr. Shapiro's request, Drs. Gale A. Bishop and Richard M. Petkewich visited the site to confirm Dr. Shapiro's identification. A request by Bishop and Petkewich for the allocation of the specimen to the Georgia Southern College Museum was granted by Georgia Power Company officials on May 31, 1983.

Between June 1 and June 11, a crew representing the Museum, with the full cooperation of Georgia Power Company personnel at the Plant Vogtle site, collected the specimen in the manner that has been used by most vertebrate paleontologists for collecting large skeletons for over a century. The extent of the skeletal materials were outlined, trenched around and isolated into blocks (Fig. 2), which were then enclosed in plaster soaked burlap (providing a plaster jacket around each block, Fig. 3). These blocks were transported to the Museum in a vault truck provided by a Statesboro monument company and unloaded into the Museum on June 14, 1983.

In total, over 3,300 pounds of the rock, the enclosed whale skeleton, plaster and wooden framework were collected from the site in five plaster jackets (Fig. 4). All of this material was from an approximately 16 square foot area with the exception of two small blocks that were recovered from construction on the blowdown structure, perhaps 600 feet southeast of the skeleton, and which must represent another animal.



FIG. 1 Index map of Georgia showing Plant Vogtle whale locality. (Burke County in diagonal lines, whale locality represented by a dot)



FIG. 2 Isolated block of rock containing whale at the water intake structure. Graduations on the jacob staff are 0.1 meter or approximately 4 inches long.



FIG. 3 Preserving the whale skeleton in a plaster jacket.

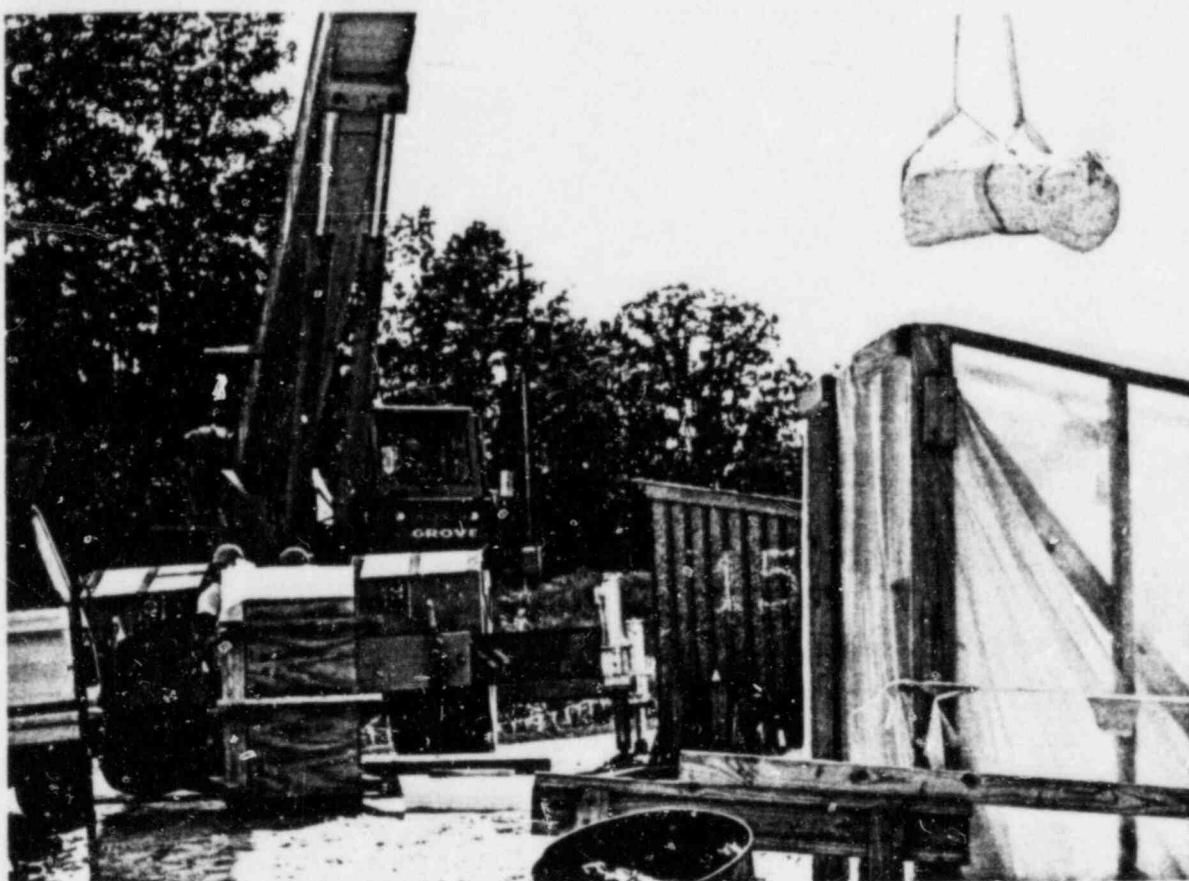


FIG. 4 Removing a plaster-jacketed block from the site.

At this time, it is difficult to ascertain the degree of completeness of the skeleton. Elements that were recognized during the collection of the block were: the roof of the skull; the lower jaws (Fig. 5), which are incomplete; at least 12 ribs; and probably seven vertebrae. The skeleton is somewhat disarticulated (for example, the skull was some 3 feet posterior to the lower jaws), but it is believed that a significant part of the skeleton is probably still enclosed in the blocks of rock.

Personnel involved in the collection of the specimen included faculty and students of the Department of Geology and Geography at Georgia Southern College and friends of the G.S.C. Museum, volunteers representing the Red Mountain Museum in Birmingham, Alabama, volunteers representing the Georgia College Department of Biology and representatives of the Georgia Geological Survey.

Georgia Power Company provided a coordinator for the project from their Environmental Department, a 24-hour security guard on the specimen from the time it was recognized that the specimen was of scientific importance until the project was completed, two laborers to assist in any way possible throughout the duration of the project and the use of any tools and/or equipment necessary to facilitate the procedures.

When the area surrounding the large skeleton was cleared for approximately five feet in all directions without encountering bone, the collection was considered complete. The first of two small blocks containing bone from the blowdown structure was reported by a construction worker after it had been excavated and moved. The area from which it came was thoroughly prospected by personnel representing the G.S.C. Museum without locating any more of the specimen. As construction continued in this area, the Georgia Power Environmental Department surveillance resulted in the



FIG. 5 Archaeocete whale jaws exposed as discovered.

recovery of the other small block containing a single vertebrae. It would be considered highly fortuitous if any more of this specimen is recovered as the material that has been moved has been placed in a landfill and could only be relocated within a five acre area.

GEOLOGIC CONSIDERATIONS

The Plant Vogtle whales were collected from a series of calcareous clays (or marls) belonging to the McBean Formation of Veatch and Stephenson (1911). Figure 6 illustrates a composite vertical measured section at the site. In the water intake structure portion of the section, the first and most complete whale was collected in place in the rock at about 98 feet above sea level (noted by an "X" in Fig. 6). The two blocks of rock containing bone from the blowdown structure, some 600 feet southeast of the water intake locality, were in float and could not be located exactly in the section. On the basis of the rock type surrounding the bone in these blocks and the probable level of construction at the time of their retrieval, they most probably came from one of the units marked "Y" in Figure 6.

Most authors (Cooke, 1943, p. 55; Herrick and Vorhis, 1963, p. 25; Herrick and Counts, 1968, p. 16; Huddlestun, Marsalis and Pickering, 1974, p. 2-4) place the McBean Formation in the middle Eocene and equate it to the Lisbon Formation of middle Eocene age in Alabama. Mr. Paul Huddlestun, a Georgia Geological Survey geologist, reports the presence of the foraminifera Truncorotaloides rohri and Truncorotaloides cf. topilensis and juvenile oysters of the species Ostrea sellaeformis in a sample processed by him from the sediment enclosing the whale from the water intake structure. The presence of these forms confirm a middle Eocene age for this whale (Huddlestun, pers. comm., July 22, 1983).

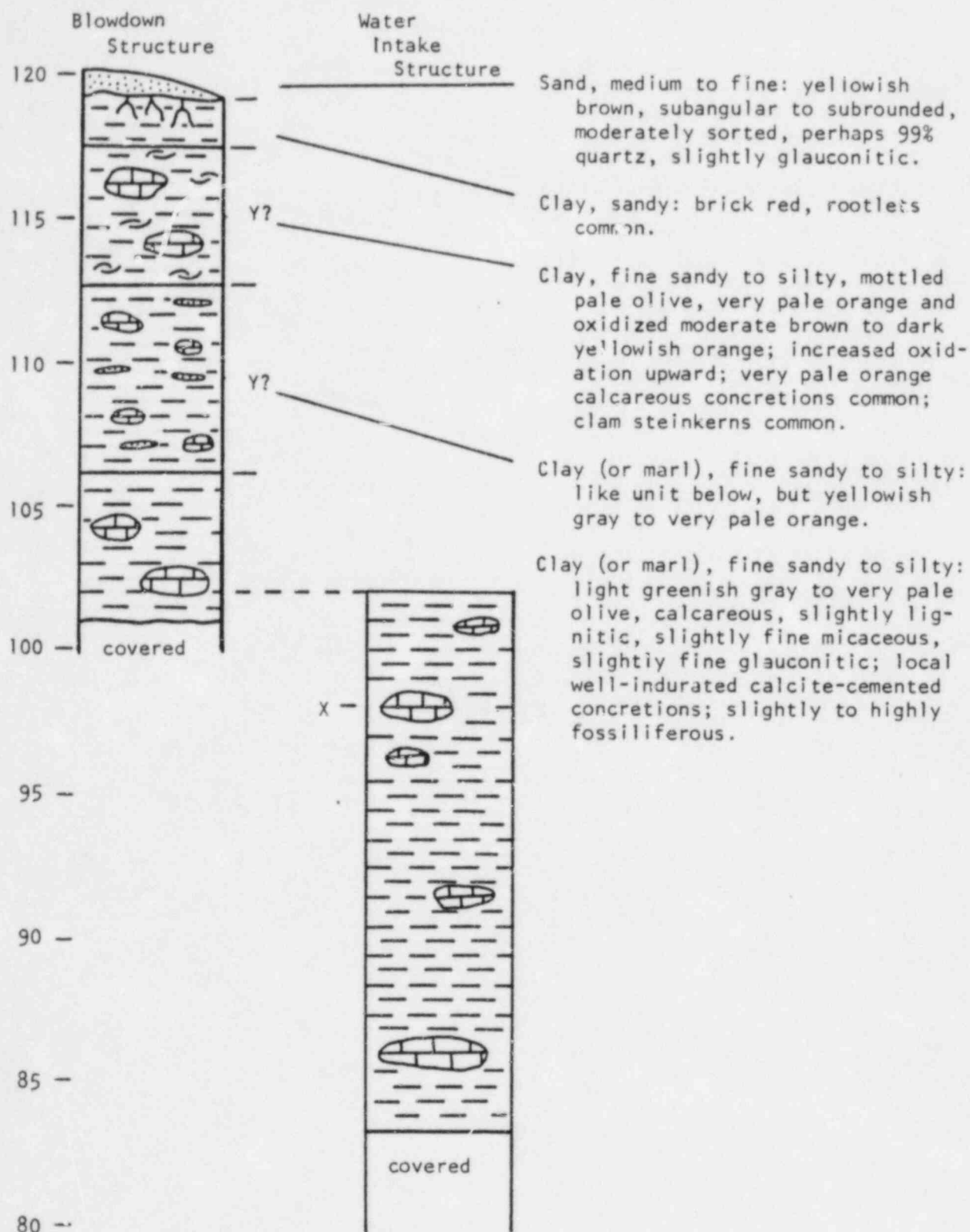


FIG. 6 Vertical section of sediments at blowdown structure and water intake structure. (Scale to left is in feet above sea level.)

PALEONTOLOGIC SIGNIFICANCE

Scientifically, the whales belong to the Order Cetacea, a group of mammals that took up life in the marine environment and which have common structural modifications that distinguish them from all other mammals. There are three distinct suborders of whales, two of which are still living and the third of which is extinct (Matthews, 1978, p. 26).

1. The ARCHAEOCETI, archaic whales that lived between perhaps 50 and 20 million years ago and possess many primitive characteristics that link the modern whales with their terrestrial ancestors. These gave rise to the other two suborders.
2. The ODONTOCETI, the toothed-whales which include the sperm whale and the dolphins and porpoises, and
3. The MYSTICETI, the baleen or whalebone whales in which a sieve-like structure called baleen replaces teeth in the food-gathering function.

The Plant Vogtle whale is more certainly an archaeocete (archaic whale) as could be determined at the site from the primitive nature of its dentition. Further determination of its relationships (eg., genus and species) will be impossible until it is removed from the rock to allow more careful inspection (it possibly even represents a new species).

The origin of whales and their earliest history is little known. The earliest and most primitive known specimen comes from early Eocene (perhaps 50 million years old) deposits in Pakistan (Gingerich, et al., 1982). The specimen is fragmentary in that it consists of only a lower jaw and partial skull.

Middle Eocene (around 45 million years old) archaeocetes are most well known because several specimens representing three genera have been collected,

primarily in northern Africa and India (Gingerich, et al., 1982, p. 403). These again are known only from partial skeletons and, therefore, we have much to learn about the middle Eocene state of evolution, particularly in the appendicular skeleton (arms and legs and their supporting girdles). A single archaeocete dorsal vertebra has been collected in North America from the middle Eocene Lisbon equivalent in Texas (Kellogg, 1936, p. 242-243). Since the Plant Vogtle specimen is of middle Eocene age, it represents an extremely significant find because of its geographical location and the apparent degree of completeness of the skeleton.

Late Eocene (about 40 million years old) archaeocetes are relatively well known. Fairly complete specimens have been collected in many parts of the world, including the United States. Fine mounted specimens are on display at the National Museum of Natural History in Washington, D.C., at the Louisiana State University Museum and at the Museum of Arts and Sciences in Macon, Georgia, to name a few. Although these specimens have primitive characteristics, which link them to the older archaeocetes, they are too advanced or specialized in their post cranial anatomy to give us direct knowledge of whale origins. For example, their rear appendages are much reduced and presumably were lost in the musculature (i.e., did not extend outside the body) as is the case in all modern whales.

SUMMARY

The Plant Vogtle whales have extreme scientific significance because they represent the most complete specimens known from sediments of middle Eocene age in North America and possibly the world. The total significance of this specimen cannot be determined until it is properly prepared (separated from the enclosing rock and preserved) which is a process that will take many months. Representatives of the Georgia Southern College Museum, with the assistance of local scientists from other institutions and the full cooperation of Georgia Power personnel at the Plant Vogtle site recovered as much of the specimens as possible, to be conserved in the museum, with no significant disruption of construction at the site.

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