

THE PLEISTOCENE FOSSILIFEROUS DEPOSIT AT  
LADDS, BARTOW COUNTY, GEORGIA

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Northern Georgia has been virtually terra incognita for Pleistocene vertebrate paleontology. An inauspicious beginning was made in 1890 with the description of a supposed species of giant beaver, *Castoroides georgiensis*, by Joseph Moore (1890a), based on a tooth said to have been found during the Civil War in "some old forsaken gold diggings" in "Northern Georgia." The specimen was recognized almost immediately after publication as a tusk of the modern hippopotamus (Cope, 1890; Moore, 1890b).

The next discovery known to us is that of an isolated right third upper molar of American Mastodon, *Mammot americanum*, found in 1950 by Mr. H. H. Lipscomb during dredging of the bed of Lipscomb Branch on his farm 1.7 miles northwest of White, Bartow County. Through the good offices of Mr. Thomas L. Kessler of Cartersville the tooth was sent to the U. S. National Museum for examination, and was subsequently donated by Mr. Lipscomb to the Museum where it has received the catalogue number 20563.

Cofer (1953) has identified two genera of land snails, *Triodopsis* and *Mesodon*, from a local conglomeratic deposit of probably Pleistocene age, interstratified with Paleozoic rocks, located three-fourths of a mile south southwest of Van Wert, Polk County. As yet no vertebrates are known from this site.

In 1955, a partial left mandibular ramus of a tapir, *Tapirus veroensis*, was recovered from Anderson Spring Cave, Walker County. The specimen was reported upon by Gray and Cramer (1961) and was compared to other specimens from eastern United States by Ray (1964, table 1).

Greear (1964) reported the discovery of a partial skeleton of Black Bear, *Ursus americanus*, of probable Pleistocene age in a cave in Blacks Bluff (or Coosa Bluff) approximately three miles southwest of Rome, Floyd County.

In the fall of 1963 Mr. and Mrs. Warren Moore and family discovered fossil gastropods and vertebrates in a limestone quarry at Ladds, Bartow County. The quarry is developed in the southeastern end of Quarry Mountain (or Ladds Mountain) approximately 2.3 miles west southwest of Cartersville, 34° 09' N., 84° 50' W., in Land Lot 591, 4th District, 3rd Section of the Georgia Land Survey of 1832 (Figure 1).

Quarry Mountain is an isolated dolomite ridge reaching a maximum elevation of almost 1100 feet and standing approximately 500 feet above the surrounding countryside. The ridge is composed of the lower Paleozoic Knox Dolomite, a thick-bedded,





FIGURE 1

Aerial photograph (U. S. Department of Agriculture, 1960) showing the location of the Ladds fossil locality near Cartersville, Bartow County, Georgia. Inset shows location of the county within the state.



cherty, gray dolomite (Butts and Gildersleeve, 1948, pp. 17, 128). Spencer (1893, pp. 104-105) has described the mountain very well, as follows:

Ladd's mountain, three miles southwest of Cartersville, is an isolated mass, but may be taken as a type of the dolomite ridges . . . It rises about 500 feet high, with a northern and southern trend. Its face has been uncovered for quarry purposes. The rock is a siliceous, hard and somewhat brittle dolomite, from light to dark in color, but all fine grained, compact and crystalline. The layers are thick. The bedding is disturbed, and in places appears as if the rocks had fallen into cavities, which may have been the case. The dip is  $10^{\circ}$  S.  $80^{\circ}$  W., and owing to form of exposure and undulations, the direction cannot be accurately determined; but probably a little south of west. There are joints of 50 feet or more in depth, which have been opened by decay and filled with clay. These commonly trend east and west, and are 20 to 30 feet or more apart. There are other joints with directions northeast and southwest, and again others at right angles.

This mountain is pierced by caves, some of which are vertical channels. These have been formed by streams dissolving out the limestone after uplift of strata, but before denudation of the valley, as already pointed out. The caves contain large and beautiful stalactites.

The quarry was in the past operated commercially by the Ladd Lime Company (Maynard, 1912, pp. 271-273; pl. 22A), some of whose structures remain on the site (fig. 2A). In recent years the quarry has been operated by Bartow County, now the owner, as a source of road metal.

The Pleistocene fossils occur in the materials deposited in the solution cavities of the dolomite. These late deposits include flowstone which encloses or encrusts some of the fossils, and red cave earths, in part unconsolidated and in part thoroughly, though erratically, cemented through carbonate deposition into a "cave breccia." The fossiliferous deposits known to us thus far occur in a small remnant of the southeast corner of Quarry Mountain separated from the main body of the mountain by blasting and quarrying (Figure 2). Fossils have been collected directly from the old land surface, from rubble resulting from blasting, from crevices among boulders, and from solution holes of various sizes wherever remnants of cave earth, "breccia," or flowstone remained. As a result of these conditions, there is every reason to expect mixing of materials deposited at different times, and the apparent ecological incompatibility displayed among the fossil mammals reinforces this supposition (Ray, 1967).

Mr. and Mrs. Moore, who were enrolled at Shorter College in the 1963-64 National Science Foundation In-service Institute for

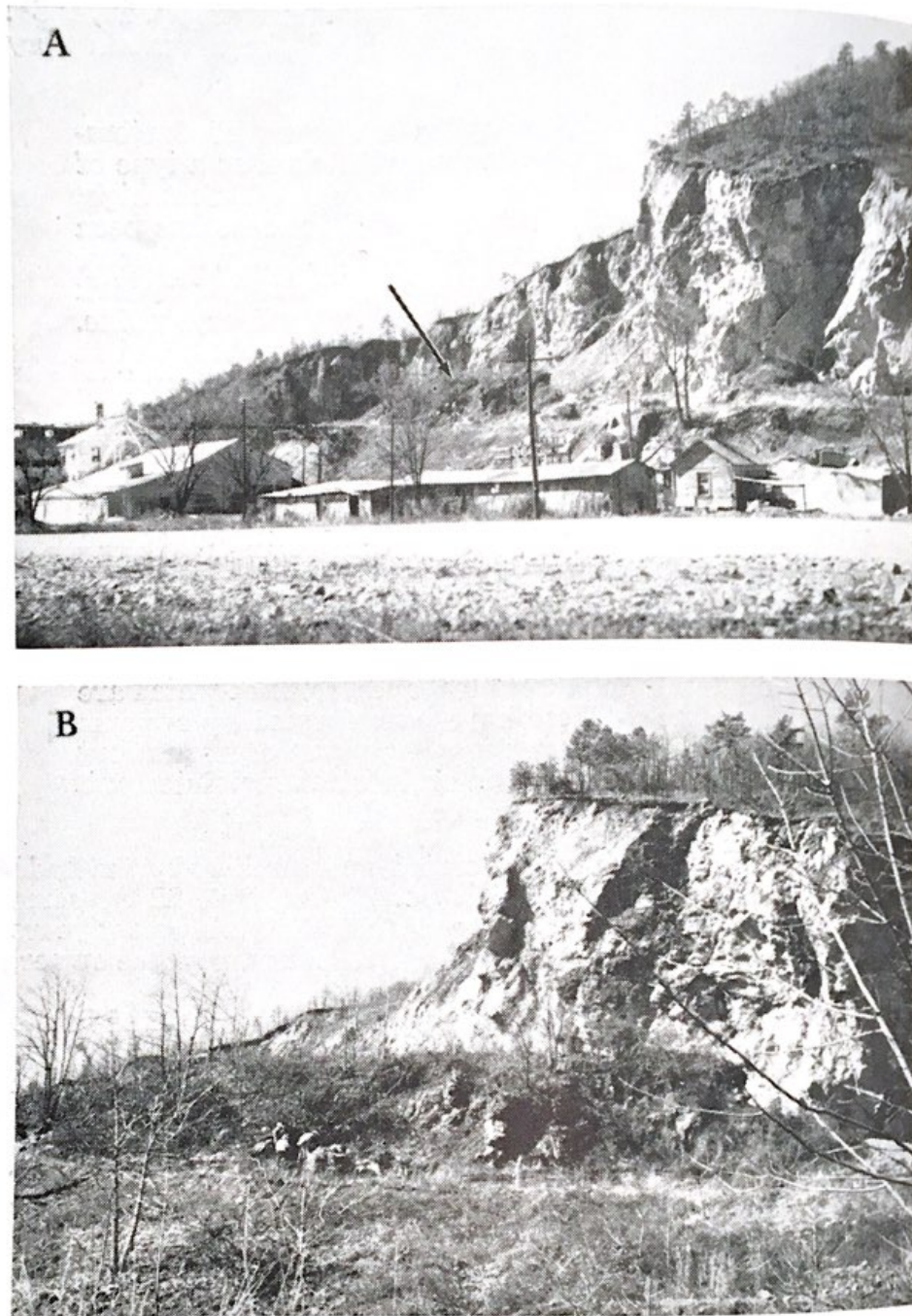


FIGURE 2

The Ladds fossil locality, showing limestone quarry at southeastern end of Quarry Mountain with fossiliferous remnant separated from main body of mountain by quarrying.

- A. View looking southwesterly showing fossil locality (arrow) and buildings of former cement plant.
- B. View looking westerly showing fossil locality, with quarry and Quarry Mountain in background.



public school teachers, reported their discovery to faculty members of the College. One of us (Lipps) informed the Smithsonian Institution of the find in December, 1963. Following a brief visit to the site in April, 1964, by Ray in company with staff, students, and interested associates of Shorter College, a cooperative program of exploitation of the deposit was devised between Shorter College and the Smithsonian Institution. Although Ray has visited the site subsequently on two occasions, essentially all field work has been done by personnel affiliated with Shorter College, aided by modest financial support from the Smithsonian Institution. Collecting has been by standard techniques in the field, primarily for macrofossils, and by "washing" the cave earth for microfossils. Because of the proximity of the site to the College, whole matrix has been transported to the campus for processing rather than concentrated in the field. The Moore family continued collecting through the summer of 1964 after which they left the area. Some of the most important specimens obtained to date were collected by them. Principal participants from the faculty of Shorter College have been Drs. Philip F-C. Greear, Paulina Buhl, and Lewis Lipps. Friends of the College Robert Bagby, Charles Cressler, Jennings B. Gordon, Jr. and James Lewis all have been active at various stages in the field work. Students too numerous to list here have contributed enthusiastically to the project, in collecting (both fossil and Recent animals), washing and picking microfossils, and packing materials for shipment. Without their interest the project would have been impossible. While not wishing to minimize the contributions of others, courtesy demands that certain student participants be mentioned individually, including Frederick Amos, Robert Anoka, Leon Avery, D. David Bailey, Ronald Casey, James Cole, Fred Garner, Jack Grant, John Henry, James Parker, Larry Thompson, Lamar Thornbrough, Stephen Shapiro, and Robert Swint. The project of course could have been neither initiated nor carried on without the interest and cooperation of Mr. Griffin Smith, Bartow County Commissioner, who granted access to the quarry and took steps to prevent further destruction of the fossiliferous deposit.

Beginning in 1963 and continuing to the present, fossils have been collected, washed, picked, preliminarily sorted, packed, and at irregular intervals shipped to the Smithsonian Institution. There Ray has further sorted the material taxonomically, and distributed it to specialists for study: mammals to Ray, birds to Wetmore, reptiles and amphibians to Holman, mollusks to La Rocque, and matrix samples for possible pollen analysis to Benninghoff, all of whom have prepared reports which appear subsequently in this issue of the BULLETIN. Prior to the present deposit (Ray and Lipps, 1965; Ray, 1965). Sorting and study of washed concentrate (especially postcranial material) is highly incomplete, and field work continues; thus, supplementary reports are anticipated for the future. Unique specimens, types, and series



will be housed in the Smithsonian Institution. A synoptic collection will be maintained at Shorter College.

The Ladds assemblage of Pleistocene vertebrates and non-marine mollusks is the first of its kind from Georgia. Other discoveries of Pleistocene vertebrates in Georgia have been isolated, casual finds, mostly near or on the coast, whereas Ladds is located in the northwestern inland portion of the state, and has yielded thus far 78 species of vertebrates and 25 species of mollusks. The Ladds deposit lies in a geographic gap extending from comparable, rich Pleistocene fissure deposits of north-central Florida to those of Robinson Cave, Overton County, north-central Tennessee (McCrary, 1964; Guilday and McCrary, 1966; fauna not yet reported fully, in the hands of Dr. John E. Guilday, Carnegie Museum, Pittsburgh) and the Natural Chimneys, Augusta County, Virginia (Guilday, 1962). The Ladds site affords only a bare beginning toward filling this void, and it is to be hoped that other sites, hopefully undisturbed and propitious for stratigraphic excavation will come to light in the near future.

#### SUMMARY

The fissure fillings of the Ladds site at Quarry Mountain, 2.3 miles west southwest of Cartersville, Bartow County, have yielded the first extensive Pleistocene vertebrate (78 species) and non-marine molluscan (25 species) assemblage from Georgia. The locality lies in a geographic gap for comparable Pleistocene deposits previously extending from north-central Florida to north-central Tennessee.

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