

THE ARCHAEOLOGY OF  
ST. CATHERINES ISLAND:  
5. THE SOUTH END  
MOUND COMPLEX

CLARK SPENCER LARSEN AND  
DAVID HURST THOMAS

VOLUME 63 : PART 1  
ANTHROPOLOGICAL PAPERS OF  
THE AMERICAN MUSEUM OF NATURAL HISTORY  
NEW YORK : 1986



A brochure listing all the available anthropological reports that have been published by the Museum from 1896 to the present in the *Anthropological Papers*, *Novitates*, and *Memoirs* as well as the *James Arthur Lectures on the Evolution of the Brain* will be sent on request. Write to: Publications, Department of Anthropology, American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024.

THE ARCHAEOLOGY OF  
ST. CATHERINES ISLAND:  
5. THE SOUTH END  
MOUND COMPLEX

CLARK SPENCER LARSEN

*Research Associate, American Museum of Natural History  
Associate Professor, Department of Anthropology  
Northern Illinois University*

DAVID HURST THOMAS

*Curator, Department of Anthropology  
American Museum of Natural History*

WITH CONTRIBUTIONS BY

DALE L. HUTCHINSON

*Department of Anthropology  
University of Illinois*

DEBORAH MAYER O'BRIEN

*Development Department  
Mystic Seaport Museum*

LORANN S. A. PENDLETON

*Department of Anthropology  
American Museum of Natural History*

DEBRA PETER

*Department of Anthropology  
American Museum of Natural History*

ILLUSTRATED BY DENNIS O'BRIEN

ANTHROPOLOGICAL PAPERS OF  
THE AMERICAN MUSEUM OF NATURAL HISTORY

Volume 63, part 1, pages 1–46, figures 1–22, tables 1–17

Issued October 27, 1986

Price: \$5.45 a copy

## CONTENTS

Abstract .....	4
Introduction .....	4
Acknowledgments .....	4
The Archaeology of South End Mound I .....	5
C. B. Moore's Research at South End Mound I .....	6
AMNH Research at South End Mound I .....	8
Human Skeletal Remains .....	13
Ceramic Artifacts. Debra Peter .....	14
Lithic Artifacts. Lorann S. A. Pendleton .....	15
Shell Beads. Lorann S. A. Pendleton .....	20
Modified Whelk Artifacts .....	21
Nonhuman Skeletal Remains. Deborah Mayer O'Brien .....	21
Discussion .....	21
The Archaeology of South End Mound II .....	21
Excavation Strategy .....	23
Stratigraphy and Features .....	24
Stage I .....	25
Stage II .....	26
Antebellum Period Disturbance .....	26
Human Skeletal Remains .....	27
Pathology. Clark Spencer Larsen and Dale L. Hutchinson .....	29
Metallic Artifacts .....	30
Copper Sheet .....	30
Copper Earspool .....	31
Galena Cubes .....	31
Preliminary Constituent Analysis of Metallic Artifacts .....	31
Lithic Artifacts. Lorann S. A. Pendleton .....	33
Stone Pendant .....	33
Projectile Points .....	34
Hammerstones .....	35
Debitage .....	36
Shell Artifacts .....	39
Ceramic Artifacts .....	39
Nonhuman Skeletal Remains. Deborah Mayer O'Brien .....	39
Discussion .....	39
Appendix .....	41
Literature Cited .....	41

## TABLES

1. Ceramic Frequencies at South End Mound I .....	19
2. Bifacial Artifacts from South End Mounds I and II .....	19
3. Whelk Beads from South End Mound I .....	20
4. Identified and Unidentified Faunal Specimens per Taxon from South End Mound I .....	20
5. Measured Stratigraphic Section of South End Mound II .....	25
6. Radiocarbon Determinations from South End Mound II .....	25
7. Human Skeletal Elements from South End Mound II .....	27
8. Human Dental Elements from South End Mound II .....	28



9. Dental Sample Employed in Hypoplasia Study .....	30
10. Elemental Analysis of Copper Artifacts from South End Mound II .....	32
11. Hammerstones from South End Mound II .....	36
12. Ceramic Frequencies at South End Mound II .....	38
13. Identified and Unidentified Specimens per Taxon from South End Mound II .....	39
14. Postcranial Dimensions, South End Mound I .....	41
15. Summary of Postcranial Dimensions, South End Mound II .....	42
16. Dental Dimensions, South End Mound I .....	42
17. Summary Statistics of Dental Dimensions, South End Mound II .....	43

## FIGURES

1. Location of South End Mounds I and II on St. Catherines Island, Georgia .....	6
2. Moore's diagram of excavations at South End Mound I .....	7
3. Urn burial from South End Mound I .....	9
4. Topographic map of South End Mound I .....	10
5. Topographic map of South End Mound I, with outline of Moore's 1897 excavations .....	11
6. Stratigraphic profile of the eastern wall of Test Pit V .....	12
7. Stratigraphic profile of the eastern wall of Test Pits III and VI .....	13
8. Moore's Vessels A and E from South End Mound I .....	16
9. Moore's Vessels Ca and Cb from South End Mound I .....	17
10. Moore's Vessels Fa and Fb from South End Mound I .....	18
11. Shell and lithic artifacts from South End Mound I .....	19
12. Topographic map of South End Mound II .....	22
13. Master stratigraphic profile of South End Mound II .....	24
14. Detail of Burial 1 at South End Mound II .....	28
15. Reference points on human dentition .....	29
16. Frequency of hypoplastic events .....	30
17. Mean area of hypoplasia .....	30
18. Duration of hypoplastic events .....	30
19. Energy dispersive spectrometry of galena cube from South End Mound II .....	33
20. Back scatter electron image of galena cube from South End Mound II .....	34
21. Diabase-like pendant, hammerstones, and copper artifacts from South End Mound II .....	35
22. Bifacial lithic artifacts from South End Mound II .....	36

## ABSTRACT

This volume presents results of archaeological excavations of two prehistoric burial mounds on St. Catherines Island, Georgia. South End Mound I is an Irene period mortuary site, initially excavated by C. B. Moore during the winter of 1896–1897. Although Moore adequately described his investigations in a subsequent publication, he retained only six complete ceramic vessels for later analysis. These vessels have been reexamined and are discussed here. None of the skeletal materials excavated by Moore, to our knowledge, was saved for later analysis. Field crews from the American Museum of Natural History recently reexcavated parts of this site, finding evidence that at least some of the primary human burials previously exposed by Moore remain intact beneath the backdirt of South End Mound I. Further investigation might be fruitful.

South End Mound II, a previously unexplored mortuary site, was discovered not far from Moore's excavations. This St. Catherines/Savannah period burial mound, extensively excavated by the American Museum of Natural History, had a Central Pit containing two cremations and a mass grave containing at least 15 individuals. Grave goods included a perforated copper sheet, worked galena, a river otter mandible, and a polished stone pendant. Prehistoric copper has rarely been reported from archaeological contexts from this area and, to our knowledge, this is the first occurrence of galena in coastal Georgia. Mound construction methods resemble those employed at Johns and Marys mounds, two roughly contemporary mortuary sites on St. Catherines Island.

## INTRODUCTION

This is the fifth monograph in a series discussing the anthropology of St. Catherines Island. Previous volumes have outlined the natural setting and cultural history of the island (Thomas et al., 1978), introduced the Refuge-Deptford mortuary complex (Thomas and Larsen, 1979), defined Georgia coastal human skeletal and dental adaptations (Larsen, 1982), and discussed the St. Catherines period mortuary complex (Larsen and Thomas, 1982). A shorter monograph also considered three antebellum burials from St. Catherines Island and nearby Colonels Island (Thomas et al., 1977).

More recently, we have completed a 20 percent systematic randomized sample of prehistoric sites on St. Catherines Island; artifacts and ecofacts recovered in this extensive survey are currently being analyzed. Since 1981, the American Museum has concentrated on intensive excavations at the 16th–17th century mission site of Santa Catalina de Guale (described briefly in Garrison et al., 1985).

The present volume reports on excavations of two additional burial mound sites on St. Catherines Island, both excavated by AMNH (American Museum of Natural History) crews between November 1979 and May 1981.

Field and laboratory procedures followed those outlined in earlier volumes of this series (Thomas and Larsen, 1979; Larsen, 1982). Laboratory preparation and analysis of the human remains were conducted in the Laboratory of Biological Anthropology and Archaeology, Southeastern Massachusetts University.

## ACKNOWLEDGMENTS

This investigation would not have been possible without the generous support of the Edward John Noble Foundation and the St. Catherines Island Foundation. We especially thank Mr. and Mrs. Frank Y. Larkin for the energy and encouragement given toward this effort. The Southeastern Massachusetts University Research Committee provided Larsen with funds for the purchase of the anthropometric instruments that were used in the collection of dental and skeletal metric data.

Mr. John Toby Woods, Jr., former superintendent of St. Catherines Island, showed us the location of the two mounds described in this monograph. It was only through his cooperation and that of the permanent staff on St. Catherines Island in clearing and remov-



ing stumps, as well as their help in the myriad details involved in archaeological work, that we were able to successfully complete our operation. In particular, we also thank Mr. Royce Hayes (present superintendent), Mr. John (J.R.) Robbins, Mr. Jim Evans, and Mr. Jack Waters for assistance throughout the project.

A number of individuals deserve special thanks for providing their competencies and expertise in the solving of problems and presentation of results. Mr. Dennis O'Brien took all field photographs and prepared the final artwork presented in this report. Mr. Gary J. Sawyer (Objects Conservation Laboratory, Department of Anthropology, AMNH) conserved the copper elements from South End Mound II. Mr. Sawyer also made arrangements for a preliminary microprobe elemental analysis of these objects at the AMNH and a more extensive follow-up X-ray fluorescence analysis at the Metropolitan Museum of Art's Conservation Laboratory. Mr. Robert Bailey (Northern Illinois University) provided the geochemical analysis of a galena specimen.

The ceramics were identified by Dr. Chester DePratter, Ms. Debra Peter, and Ms. Deborah Mayer O'Brien. Mr. Greg Paulk assisted in the identification of shell artifacts. Mr. Alan Jackson and Ms. Katherine F. Russell provided assistance in the analysis of the human

remains. We thank Dr. Charles Crumly, NMNH (National Museum of Natural History) for assistance in identifying reptile and amphibian remains. Dr. Elizabeth Wing, Ms. Sylvia Scudder, Mr. Steven Hale, and Ms. Laurie Wilkins (all of the Florida State Museum) assisted in the identification of non-human mammalian remains.

We thank Ms. Una Macdowell (Peabody Museum), Ms. Brenda Holland (Heye Foundation), and Ms. Belinda Kaye and Mr. Anibal Rodriguez (AMNH) for assistance in our examination of the whole ceramic vessels excavated by C. B. Moore.

We also thank our field crew, who toiled under some rather unpleasant conditions: Jane Epstein, Lisa Sherman, Lauren Archibald, Mollie Miller, Peter Fieweger, Karen Kramer, Debra Peter, Kate Stover, Stacy Goodman, Ann Marie Lunsford, Norman Vardney Mackie III, Deborah Mayer O'Brien, Dianna Doucette, Eric Ingbar, Trudy Thomas, and Ellen Feeley.

We appreciate the efforts of Chester B. DePratter (University of South Carolina), Jerald T. Milanich (Florida State Museum), and George R. Milner (University of Kentucky Museum of Anthropology), each of whom critically reviewed this manuscript.

Editorial responsibilities rested in the capable hands of Ms. Margot Dembo.

## THE ARCHAEOLOGY OF SOUTH END MOUND I

During the fall and winter of 1896–1897, Clarence B. Moore excavated a series of burial mounds along the Georgia coast. In the course of his five-month campaign, Moore “demolished” more than 50 such mounds, recording roughly 1350 aboriginal burials (enumerated in Thomas and Larsen, 1979, table 1).

His report, which was quickly published by the Philadelphia Academy of Natural Sciences (Moore, 1897), described his investigations at seven burial mounds on St. Catherines Island: Mound near South-End Settlement, Mound near Middle Settlement, Mound in King's New Ground Field, Mound in Greenseed Field, Mound near Lighthouse,

Low Mounds at North-end (see Thomas et al., 1978, fig. 15). In all, about 120 burials from St. Catherines Island were exposed and described. Moore apparently saved only selected crania and pathological specimens, which were later donated to the NMNH, the Army Medical Museum, the Peabody Museum of Archaeology and Ethnology, and the Heye Foundation. Six whole vessels from this site were donated to the Peabody Museum, Heye Foundation, and AMNH; the remaining sherds and bones were discarded in the field. Although such practices differ radically from current standards, Moore's work remains important because he meticulously described the human material, including the

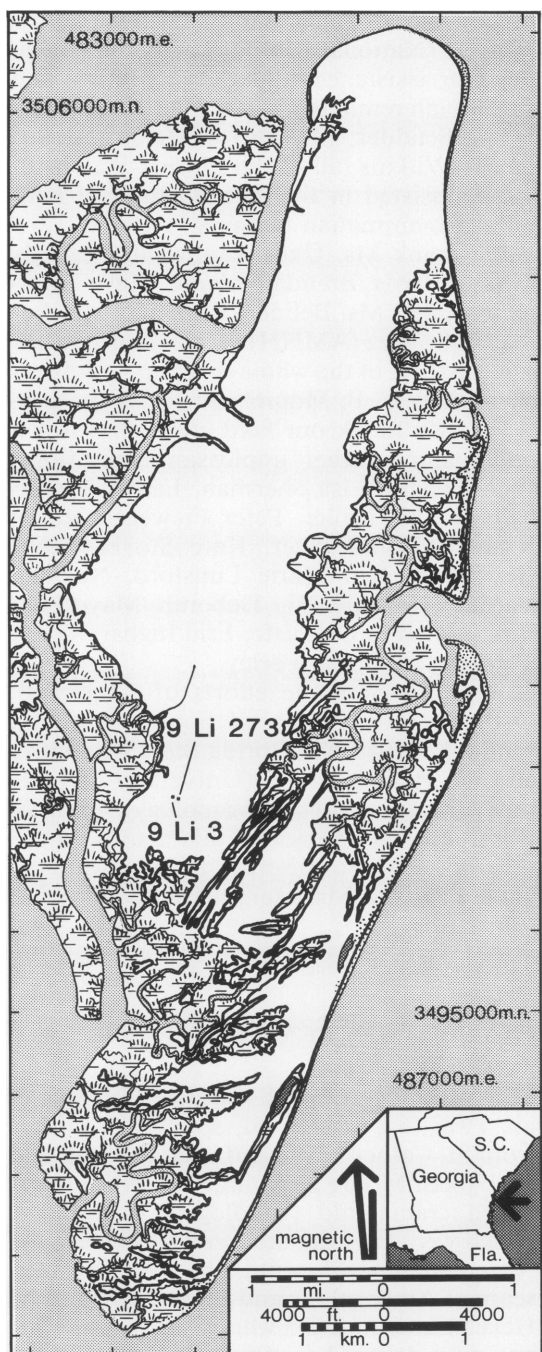


Fig. 1. Location of South End Mound I (9 Li 3; AMNH 114) and South End Mound II (9 Li 273; AMNH 121) on St. Catherine's Island.

orientation and rough estimates of sex and age.

But, as we noted earlier (Thomas et al., 1978, p. 174), Moore was no cartographer, and his published descriptions of the locations of each mound are imprecise and difficult to follow. Because of this, the whereabouts of Moore's excavations have been something of a mystery to archaeologists working subsequently on St. Catherine's Island. University of Georgia field notes indicated that Joseph R. Caldwell had searched for Moore's excavations in Greenseed Field and in King New Ground Field (Caldwell, n.d.), apparently without success.

We also periodically searched for evidence of Moore's burial mounds throughout the first five years of our work on St. Catherine's Island. In conjunction with our research in the Cunningham Mound Group, we located what almost certainly were Moore's trenches in South New Ground Mound (see Thomas and Larsen, 1979, pp. 78–82). But the location of the other six mounds remained a matter of speculation and conjecture.

In May 1979, Mr. John Toby Woods, Jr. informed us that he had located what appeared to be another of Moore's excavations, near the south end of St. Catherine's Island (fig. 1). When Mr. Woods showed us the spot, we quickly agreed with his observation. The area contained a large, semicircular zone of back dirt, and we decided to conduct limited test excavations at the site.

### C. B. MOORE'S RESEARCH AT SOUTH END MOUND I

Moore described the mound and his 1896–1897 investigations as follows:

#### ST. CATHERINE'S ISLAND, LIBERTY COUNTY. MOUND NEAR SOUTH-END SETTLEMENT.

About three-quarters of one mile in a northerly direction from the South-end Settlement, in a field long under cultivation in former times but fallow at the time of our visit, was a rather symmetrical rounded mound 3 feet in height and 68 feet across the base, the outline of which was almost exactly circular, though, as the reader may see by consulting the diagram (Fig. 49 [see also fig. 2, this volume]), burials and artifacts were by no means included beneath the



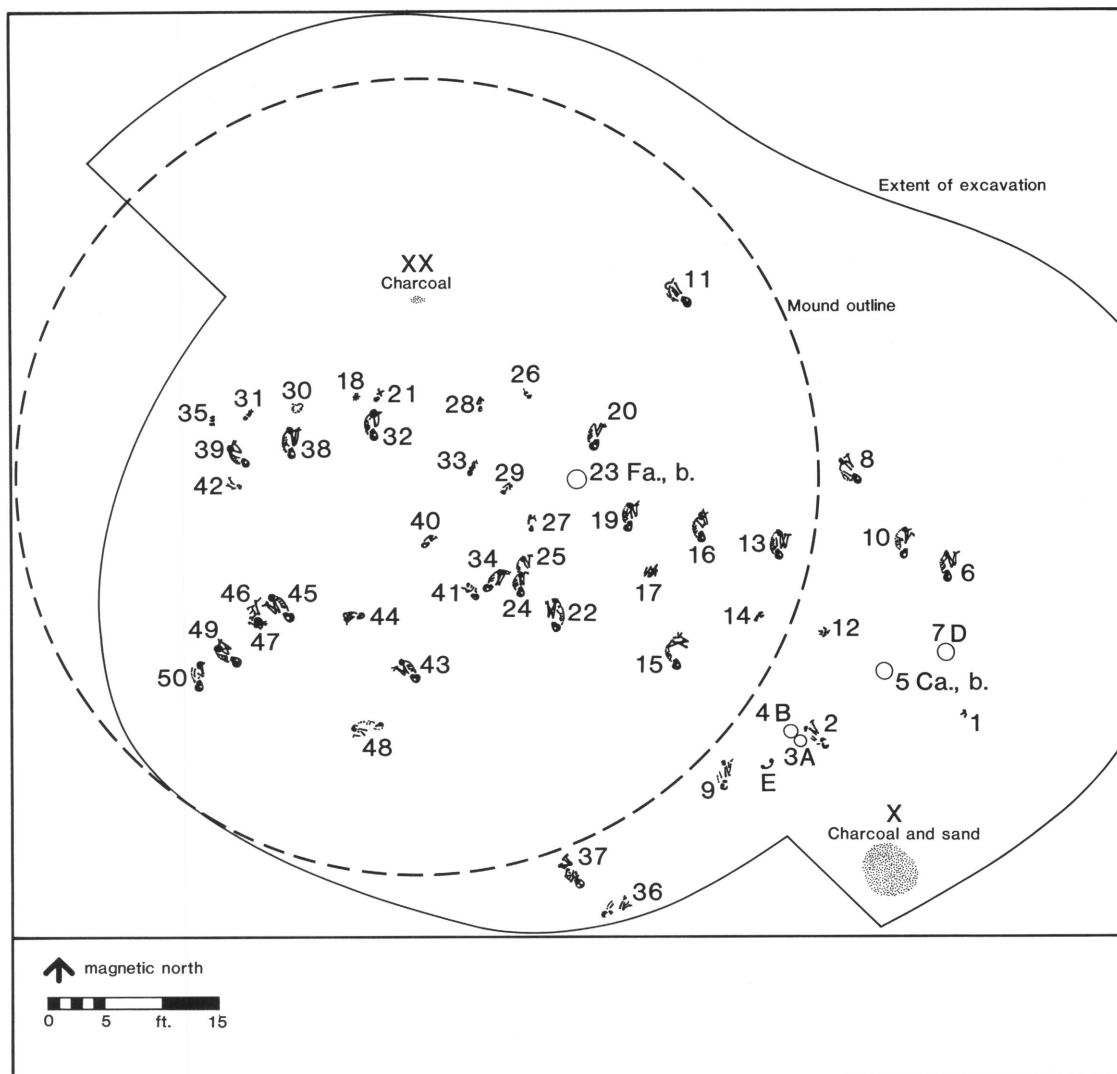


Fig. 2. Moore's diagram of excavations at South End Mound I (after Moore, 1897, fig. 49); numbers denote human burials and letters indicate ceramic vessels.

slope of the mound but extended to the east and southeast in perfectly level ground.

There had been no previous investigation.

The mound was dug through, including considerable outlying territory. Throughout the mound proper there ran, commencing at the beginning of what we took to be the original slope (for the external lower portions of the rise seemed to have been ploughed down from above), a dark band not on one level, as in many mounds we have investigated, but extremely irregular, often continuing a considerable distance into the pits which were numerous in cer-

tain portions of the mound. In default of a better theory, we believe that these pits were dug and but partly filled previous to the erection of the mound; that the field continued to be a dwelling site, and that the deposit of offal, debris, charcoal and the like, created a black surface layer in the depressions as well as on the level ground.

The mound was composed of dark loamy sand resting upon undisturbed yellow sand. Local layers of oyster shells were present, and the central portion of the mound was made up of a deposit of oyster shells about 2 feet thick—not midden refuse but loose as though brought there

at one time and deposited. This deposit extended in some directions about 10 feet from the center, in others 20 feet, while to the N.W. it continued, tapering off in thickness, to the very verge of the mound. From the highest point of the mound to the level of the black base-line, was a perpendicular distance of just 3 feet.

[A detailed enumeration of the 50 burials and grave goods follows here.]

In the mound near the South-end Settlement we note the absence of a great central pit and the presence of cremation at but one point; also that the great majority of burials were flexed on the right side and headed in a southerly direction, quite in keeping with the usual custom. All urn-burials of uncremated remains, with but one exception, were adults, coinciding with the custom as practiced on Sapelo Island. On the other hand, the reader will recall that infants alone were thus buried at Creighton Island, and will see further on the urn-burial of infants at Ossabaw Island. (1897, pp. 75, 81)

In this report, Moore described one cremation and four urn burials; most of the remaining burials were flexed and rested on their right sides. Most individuals were adult, with heads oriented primarily in a southerly direction. It is interesting to note that the series of burials that were resting on their left sides—numbers 41, 43, 44, 45, and 48—were located only within the southwestern quadrant of the burial mound. Most burials were found within, but not restricted to, the mound perimeter (Moore, 1897, p. 74, fig. 49; see also fig. 2, this volume).

This was clearly the richest mound encountered in Moore's work on St. Catherines Island, and he was so obviously impressed with the findings from this site that he included a cross-sectional view of one of the burials as the color frontispiece of his 1897 publication (fig. 3).

Moore's report suggests that this site was used predominantly during the Irene Phase. A number of grave goods were described, including a soapstone pendant, a large number of shell beads, some ceramic pipes, and several parts of decomposed rattles. The six ceramic vessels (donated to various museums) have been reexamined and are described below.

Although Moore's field methods can be criticized from our late 20th century perspective, his techniques were wholly accept-

able to his contemporaries. To his credit, Moore also included in his report detailed descriptions of each of the 50 burials that he encountered; his field notes describing this site and others examined on the Georgia coast are preserved at the Museum of the American Indian, Heye Foundation. Finally, a carefully executed map showing the burials in relation to the margin of the mound and margin of the excavation of the mound near South End Settlement is provided in Moore's report, thus making it possible to relate our excavations to his overall site plan (fig. 2).

### AMNH RESEARCH AT SOUTH END MOUND I

This site is designated in our field notes as South End Mound I (AMNH 114) and has been recorded as 9 Li 3 in the University of Georgia site files.

Shortly after Mr. Woods showed us the site, we prepared a detailed topographic map and excavated six 1 m. square units, to an average depth of 90 cm. Figures 4 and 5 present topographic maps from these preliminary excavations. Note in particular the two well-defined borrow pits, on the eastern and southern margins of the mound (fig. 5).

Throughout our various mortuary excavations on St. Catherines Island, we have encountered relatively repetitive stratigraphic sequences. The bottom of the stratigraphic column is generally defined by a pale brown sterile sand substratum (designated as Unit I), capped by a dark grayish brown zone of primary humus (Unit II). This level, which defines the ground surface prior to mound construction, is usually overlain by a mottled zone of grayish brown mound fill (Unit III). The upper portion of the column is almost always defined by a poorly developed secondary humus (Unit IV), generated by postconstruction weathering. Any postconstruction fill is designated as Unit V. Regardless of the individual cultural features often contained therein, this sequence has been observed in more than a dozen prehistoric mortuary mounds on St. Catherines Island (Thomas and Larsen, 1979, figs. 9, 10, 23, 27, 30, 36, 44, 48, 49, 52, and 58; Larsen and Thomas, 1982, figs. 4, 5, 18, and 19).

Figure 6, depicting the east wall of Test



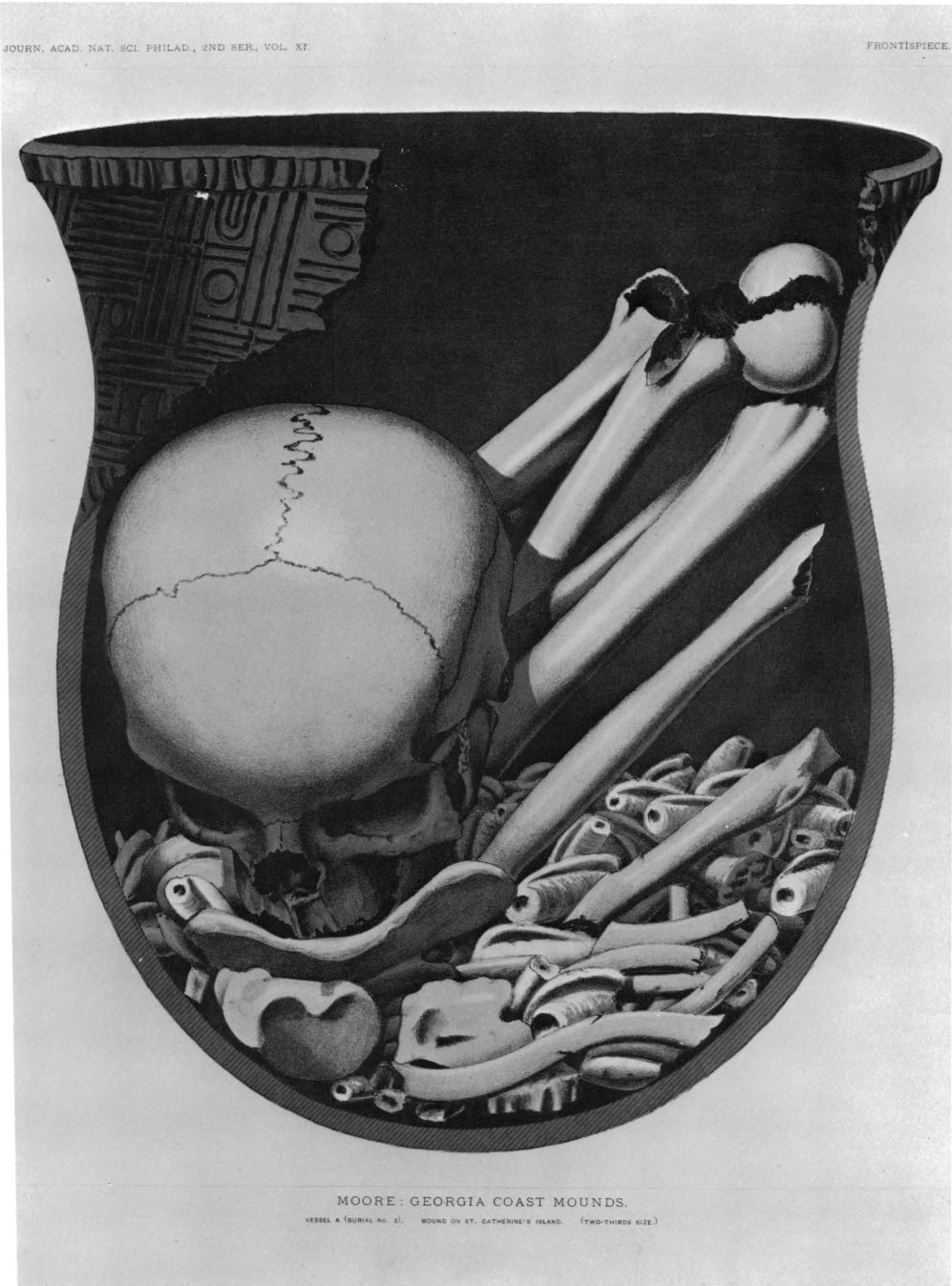


Fig. 3. Urn burial (Vessel A, Burial 3) from South End Mound I, St. Catherines Island (after Moore, 1897, frontispiece).





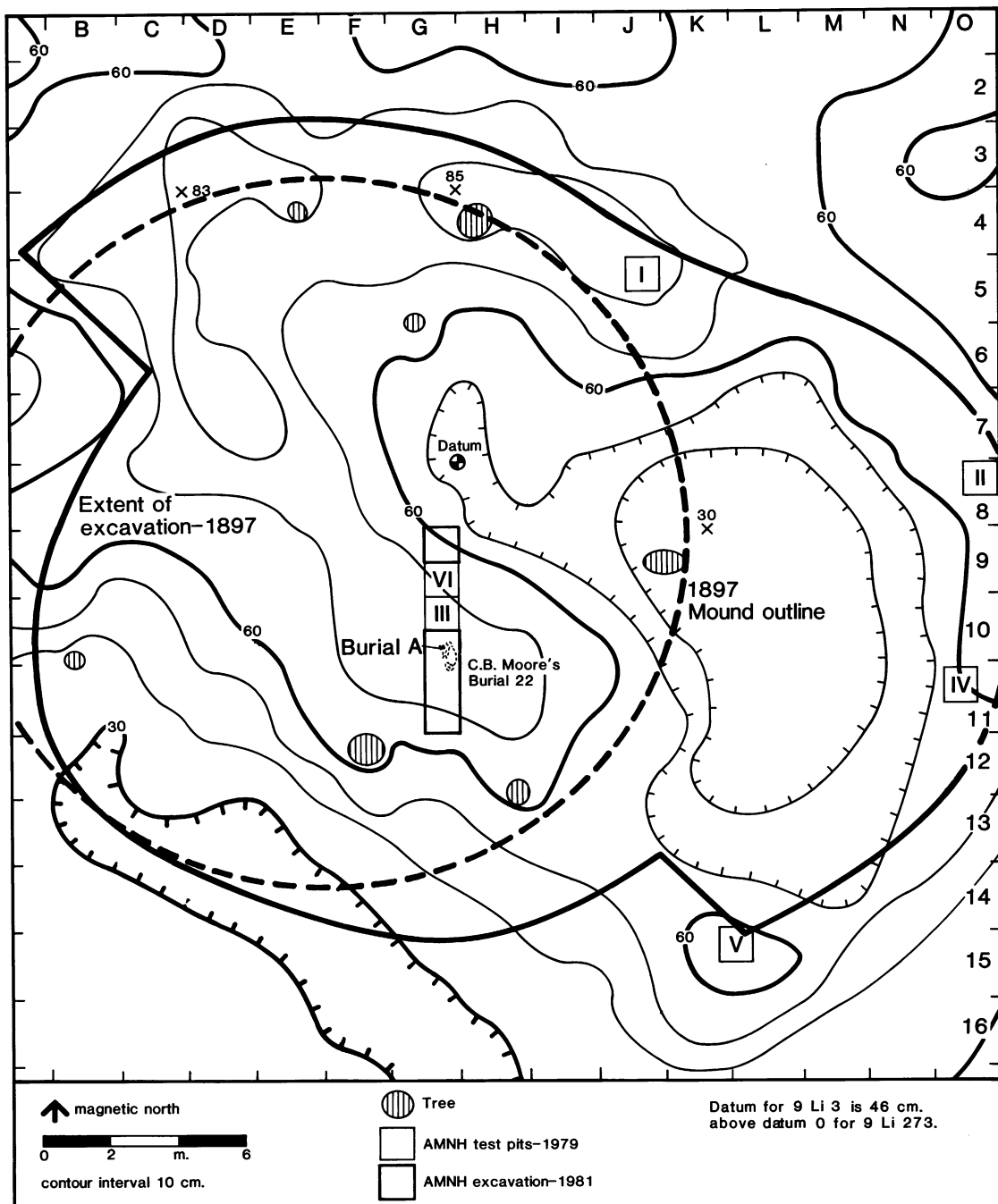


Fig. 5. Topographic map of South End Mound I, with outline of Moore's 1897 excavations added.

poorly developed secondary humus (Unit IV) occurs in the southern part of the profile, covered with a zone of tertiary fill (Unit V).

But the northern portion of figure 6 shows

a markedly different stratigraphic sequence. Although the primary humus (Unit I) remains partly intact, a steeply sloping pit is evident; the basal levels were filled with hor-

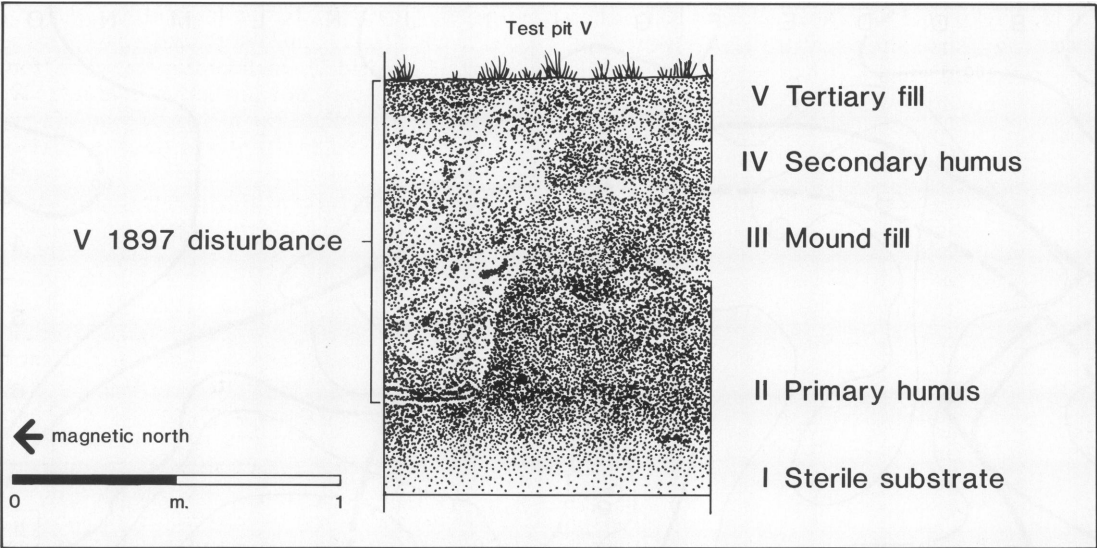


Fig. 6. Stratigraphic profile of the eastern wall of Test Pit V at South End Mound I. The vertical pit evident in this section marks the southeastern margin of C. B. Moore's excavation.

horizontal lenses, which become increasingly vertical toward the top of the profile. This pit fill (designated as Unit V) postdates the primary construction of South End Mound I. Whereas the southern part of this profile indicates undisturbed mound fill, in the northern portion of Test Pit V we encountered postmound disturbance, almost cer-

tainly the jagged southeastern corner of C. B. Moore's previous excavation (see figs. 5 and 6). The other profile (fig. 7) from South End Mound I, depicting the eastern wall of the contiguous Test Pits III and VI, shows an obviously mixed and disturbed fill, the result of backdirt generated in previous excava-

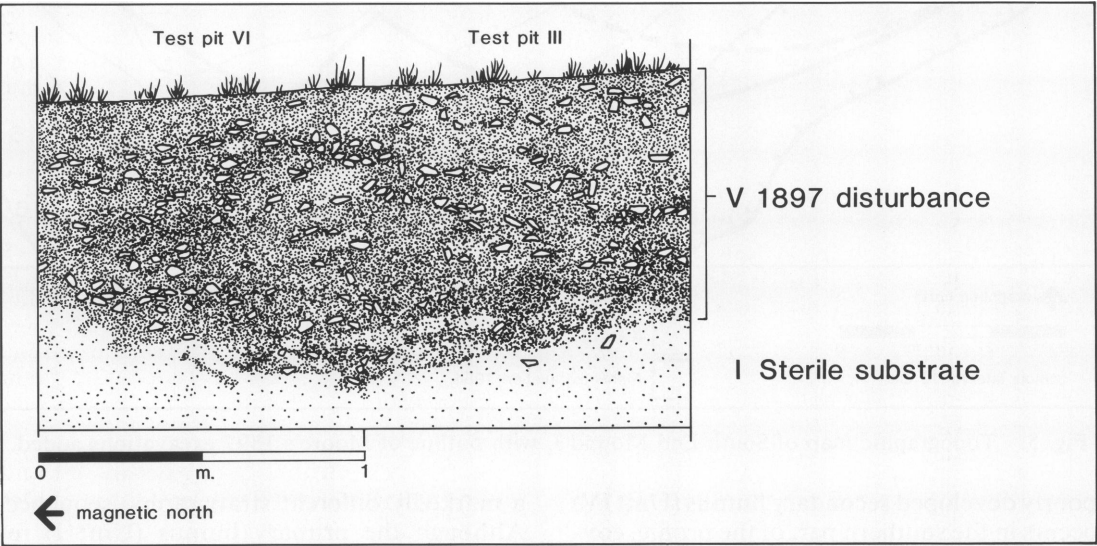


Fig. 7. Stratigraphic profile of the eastern wall of Test Pits III and VI at South End Mound I.

tions. The primary humus has been removed, so that a dense shell feature lies directly on the truncated sterile substratum. According to our reconstruction of Moore's excavation (fig. 5), this profile cuts through the southeastern quadrant of Moore's excavation at "Mound Near South-end Settlement" (Moore, 1897, pp. 74–81).

An additional three test squares were excavated in May 1981: a 1 m. square immediately north of Test Pit VI and a 1 × 2 m. unit adjacent to and south of Test Pit III. These excavations were positioned to provide a continuous north–south test trench 6 m. in length; these squares are completely enclosed within Moore's excavation.

Although no human burials were encountered in these excavations, disturbed and re-deposited human bones occurred throughout the 6 m. trench. In addition, the undisturbed, articulated left and right feet of an adult were found buried in a shallow submound pit. These feet are undoubtedly the remaining portion of an interment that Moore and his associates came upon during the fall and winter of their 1896–1897 expedition. The size, texture, and color of the numerous adult bones and bone fragments found in the surrounding secondary fill suggest that all derive from the same individual, probably the same one represented by the undisturbed feet. This individual, described below as Burial A, probably corresponds to Moore's Burial 22 (fig. 2).

### HUMAN SKELETAL REMAINS

A minimum of four individuals were recovered from limited test excavations at South End Mound I. The three preadults (Burials B, C, and D) were recovered from square G-9. With the exception of a tooth (found in square G-11), all bones and teeth from Burial A were found in square G-10.

**BURIAL A** (probably corresponds to Moore's Burial 22 [Moore, 1897, p. 84]): An adult of unknown age; the morphology of the preauricular sulcus (cf. Houghton, 1974; Stewart, 1979), the presence of a wide sciatic notch, and the overall gracile nature of the postcranial skeletal elements suggest that this was a female. The following skeletal elements, mostly fragmentary, are present: ilium (left, right), ischium (left), scapula (right), humerus (left, right), radius (left,

right), ulna (left), femur (right), fibula (side?), calcaneus (side?), first cuneiform (right), second cuneiform (side?), metatarsals (five left, four right), proximal foot phalanges (five left, five right), intermediate foot phalanges (two left, two side?), terminal foot phalanx (left), foot sesamoid, pisiform, greater multangular (right), lesser multangular (right), hamate (right), metacarpals (four left, one right), proximal hand phalanges (two side?), intermediate hand phalanx (side?), ribs, thoracic vertebrae, lumbar vertebrae, and sacral vertebrae. Six left mandibular teeth were present as well; these include the lateral incisor through second molar. All teeth show heavy occlusal surface attrition, and the third premolar exhibits a large carious lesion. There is a large alveolar apical cyst. An additional pathological condition observed in this individual is extensive marginal lipping on the articular surfaces of one left intermediate foot phalanx.

**BURIAL B:** An individual represented by the dentition of a two-year-old. Teeth present in the maxilla are permanent, incompletely calcified central incisor and canine (left), incompletely calcified lateral incisor (right), incompletely calcified canine (right), first molars with roots showing initial formation (left and right), deciduous central incisor (left), lateral incisor (right), first molars (left and right), second molars with root apices open (left and right). One mandibular tooth is present: left first deciduous molar. A left temporal of similar age-at-death is also present and is probably from this individual. No pathologies are present in this individual.

**BURIAL C:** An individual represented by one tooth: an extremely worn deciduous second molar showing marked root resorption, this individual was probably about eight years of age at death (cf. Ubelaker, 1984).

**BURIAL D:** An individual represented by most of the skeletal elements of a young preadult. Given the maximum length of the femora and tibiae (see table 16), this individual was probably newborn (or slightly older) at death (cf. Ubelaker, 1984). Mostly fragmentary remains are present for this individual: several cranial and mandibular corpus fragments, half-developed crown of mandibular lateral incisor (right), ilium (left and right), ischium (left), radius (side?), and femur (left, right), tibia (left, right). No pathologies were present.

Summary metric statistics for dental and postcranial materials are provided in tables 14 and 16 (Appendix). It was not possible to record cranial dimensions for any of these individuals.

## CERAMIC ARTIFACTS

Debra Peter

C. B. Moore donated the complete ceramic vessels he encountered in his excavations to appropriate museums. The Peabody Museum received two such vessels, two others were sent to the Heye Foundation, and two were donated to the AMNH. As part of our inquiry into the archaeology of South End Mound I, we reexamined all six vessels in 1985–1986.

The vessels, described below, are remarkably similar to those from the Irene Mound (Caldwell and McCann, 1941, p. 38). In addition to stylistic similarities, the two pairs of Irene Complicated Stamped urns (vessels Ca and Fa; see below) contained burials and were covered with Irene Plain bowls (vessels Cb and Fb), much as were the 15 similarly paired vessels found at the Irene Mound.

Descriptive terminology follows Caldwell and Waring (1968).

## VESSEL A (Heye Foundation 17/4479):

IRENE COMPLICATED STAMPED

Figure 8a

MOORE'S DESCRIPTION: Burial No. 3, Vessel A. To the S.W. of Burial No. 2, in contact with its base, resting on undisturbed sand, 36 inches from the surface, entirely intact, was a vessel of ordinary type. . . . Within this vessel, which was unprotected by an imposed vessel or by fragments, were a number of human bones of an adult, probably representing an entire skeleton. (Moore, 1897, p. 76)

ADDITIONAL COMMENTS: When examined in December 1985, this burial urn still contained the skeleton and whelk columella beads, as illustrated in the frontispiece of the 1897 publication (fig. 8a; see also fig. 3). This relatively crude grit-tempered vessel has grass impressions, and spalls are missing near the base. The curvilinear stamping was not applied over the entire surface, and in places this decoration was smoothed over (perhaps by abrasion), especially near the base. The base is rounded and the interior burnished. Its dimensions are: height 40 cm., rim diameter 34 cm., neck diameter 26 cm., and rim thickness 0.7 cm. A carved paddle was probably used to square off the lip since stamped impressions are obvious on the edge.

A pinched rim strip (0.9 cm. wide) was applied to the edge of the rim.

## VESSEL Ca (Peabody Museum 48334):

IRENE COMPLICATED STAMPED

Figure 9a

MOORE'S DESCRIPTION: Burial No. 5, Vessels Ca., b., 44 feet E.S.E., in a pit of uncertain limits, having its base 3.5 feet from the surface and extending 22 inches into undisturbed sand, was a vessel of the ordinary type, imperforate as to the base, having the rim badly crushed. It contained the much decayed bones of an adult, probably male, not in anatomical order, with 34 large shell beads. Capping the vessel, inverted, was an imperforate bowl, undecorated save for an encircling row of knobs some distance apart, about 1.5 inches below the rim. The material, gritty ware, was fairly good in this case and had resisted pressure with the exception of a part of the rim and a portion below it, which were recovered. (Moore, 1897, p. 76)

ADDITIONAL COMMENTS: This grit-tempered vessel has been reconstructed using the original shoulder and rim fragments. It is blackened at the base and partially up the sides. The curvilinear stamping covers the entire urn, which is 38 cm. high; its rim has a diameter of 31 cm. and is 0.5 cm. thick. The interior is burnished. The rim flares outward and is slightly blackened. The lip is squared off and was probably flattened with a carved paddle since it bears evidence of stamping. A punctated strip (0.5 cm. wide) has been applied to the rim.

## VESSEL Cb (Peabody Museum 48335):

IRENE PLAIN

Figure 9c

MOORE'S DESCRIPTION: (see above).

ADDITIONAL COMMENTS: This large, cazuela (or carinated bowl) was found capping Vessel Ca, described above. It is 24.5 cm. high, with a rim diameter of 36 cm., and a shoulder diameter of 39 cm. The undecorated rim bends inward and is approximately 0.5 cm. thick. The lip is squared and flattened. Nine faint nodes—described as “knobs” by Moore—are located in the shoulder region at intervals ranging from 12 to 16 cm. and between 4 and 5 cm. from the lip. The interior is slightly burnished.

## VESSEL E (Heye Foundation 18/413):

IRENE PLAIN

Figure 8c

MOORE'S DESCRIPTION: [Burial No. 8] Vessel E, 39 feet S.E. by E., 2.5 feet from the surface was an imperforate undecorated boat-shaped vessel, entirely intact. At either end was a small perforation for suspension. This vessel apparently contained no remains of any sort, nor did it seem to be in the vicinity of a burial. (Moore, 1897, p. 77)

ADDITIONAL COMMENTS: This oblong tan/brown vessel is tempered with a large quantity of quartz grains. It is smooth but not burnished. Shellscraping is apparent near the rim. The base is rounded and blackened on both interior and exterior. Overall height is 10 cm.; the diameter of the mouth is  $23 \times 11$  cm. The two holes mentioned in Moore's text are located at each end and are 2.5 cm. from the lip. The lip is folded over and very irregular. Finger marks are evident in the interior.

## VESSEL Fa (AMNH 20/1565):

IRENE COMPLICATED STAMPED

Figure 10a

MOORE'S DESCRIPTION: Burial No. 23, Vessel Fa., b. Let into the yellow sand, with its base 3 feet 4 inches from the surface, was a burial jar (Fa.) of the usual type, imperforate, upright and very badly crushed. Within it were bones . . . , the long bones on end, side by side, near the skull, the other bones beneath. This jar, about 18 inches high, had been capped by an inverted bowl (Fb.) of black ware, with a decoration of small knobs, similar to the one previously referred to. This bowl, also crushed, was sent . . . to the Museum of Natural History, New York. (Moore, 1897, p. 78)

ADDITIONAL COMMENTS: This large vessel is of clay tempered with small to medium size quartz crystals. It is 46.5 cm. high, and the diameter at the rim is approximately 38 cm. The interior walls are burnished, and the exterior is decorated with the curvilinear Irene complicated design. The rim is 0.4 cm. thick and flares outward. The lip is squared off and flattened. The rim decoration consists of round reed impressed nodes—Moore's "knobs"—separated by two punctations at an interval of 4–5 cm. These nodes occur 1 cm. below the rim, a common style at the Irene Mound (Caldwell and McCann, 1941, p. 43).

Vessels 20/1565 and 20/1566 were reconstructed at the AMNH, with missing sections filled in.

## VESSEL Fb (AMNH 20/1566):

IRENE BURNISHED PLAIN

Figure 10c

MOORE'S DESCRIPTION: (see above).

ADDITIONAL COMMENTS: This grit-tempered bowl, found capping Vessel Fa (above) is burnished on both the interior and exterior. The outside is almost completely blackened. The vessel is 20 cm. high with rim diameter of 39 cm., shoulder diameter 41 cm., and rim thickness 0.4 cm. The base is rounded. The rim is plain but the shoulder is decorated with five nodes which occur at intervals ranging from 23 to 30 cm. and approximately 4 cm. from the lip.

In our excavations at South End Mound I, we recovered 113 sherds, more-or-less uniformly distributed throughout the disturbed mound fill (table 1). More than three-quarters of these sherds can be attributed to the Irene phase (as defined by DePratter, 1979).

Four of these sherds show secondary usage as abraders or hones (as discussed by Thomas and Larsen 1979, pp. 44–46). One Refuge Simple Stamped sherd (28.0/4228) and two sand-tempered decorated sherds that fit together (28.0/2852 and 28.0/2854) show evidence of flat surface abrasion, and subsequent use as sherd hones. One Irene Complicated Stamped sherd (28.0/4242) also has evidence of flat surface abrasion.

## LITHIC ARTIFACTS

Lorann S. A. Pendleton

Two chert projectile points (28.0/3202, 28.0/5504) were recovered from the test excavations at South End Mound I (fig. 11g, h). Both points are Middle Mississippian Triangular, or Pinellas points, thought to date roughly A.D. 1250–1600 (Bullen, 1975, p. 8). The dimensions are presented in table 2.<sup>1</sup>

Specimen 28.0/5504 (fig. 11h) is a stemless, wide (LM/WM = 1.02), triangular (WB/WM = 1.0) projectile point with a deep

<sup>1</sup> The projectile point attributes employed here follow those defined by Thomas (1981) and Pendleton (1985).



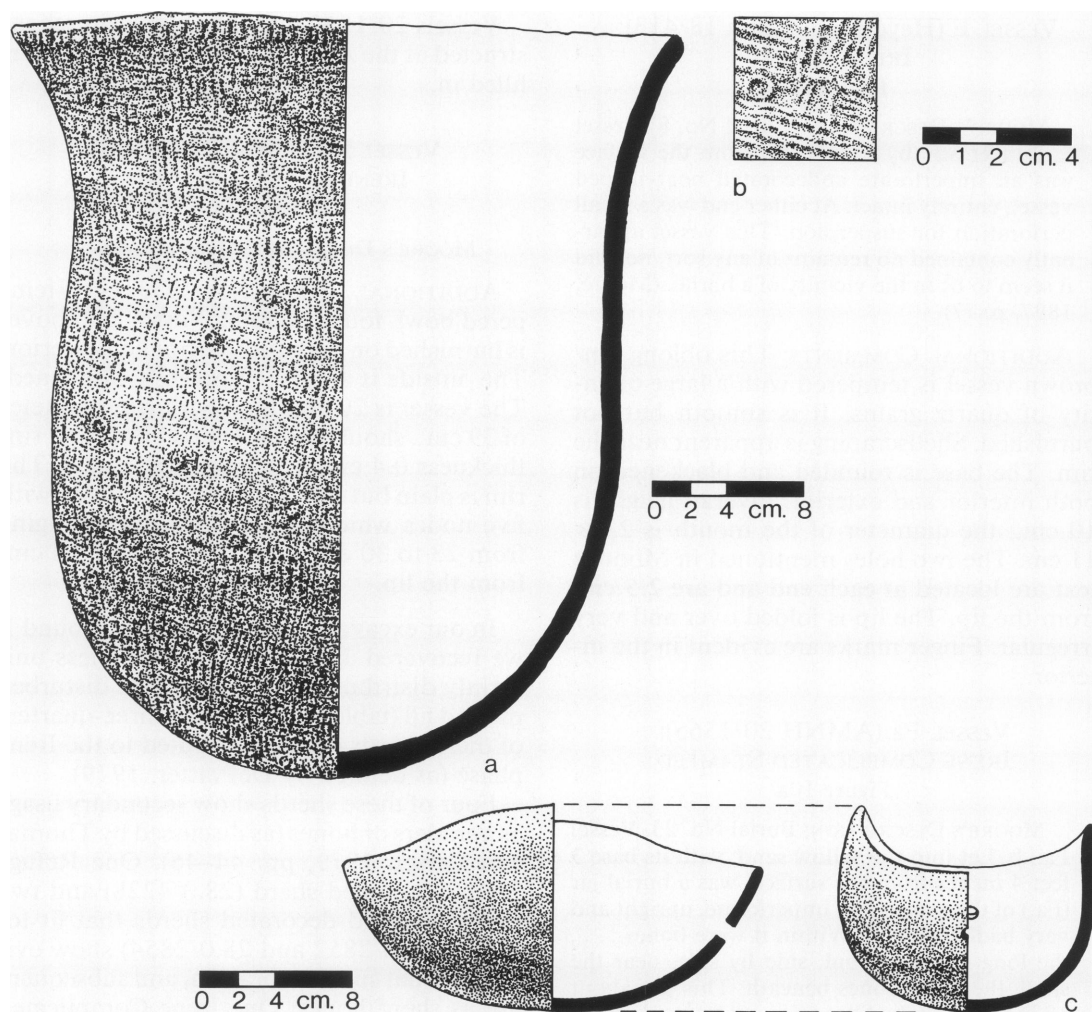


Fig. 8. Vessels from South End Mound I. a. Moore's Vessel A (Heye Foundation 17/4479), Irene Complicated Stamped burial urn (see also fig. 3); b. detail of a; c. Moore's Vessel E (Heye Foundation 18/413), Irene Plain vessel.

(BIR = 0.89) concave base. The margins are slightly incurvate. The right ventral basal margin is broken, although the fracture is minor and would not have impaired the function of the point. The fracture may have resulted from an imperfection in the material that was activated during manufacture. This artifact has a fairly thin ( $Th/WM = 0.22$ ), planotriangular cross section. The margins are steeply flaked, resulting in maximum thickness at the midline. The point does not appear to have been resharpened, although there is a break in the steepness of flaking

near the tip. All flaking is unifacial and semi-chevron in pattern. Most flake scars are indistinct; several are wide, overlapping, parallel-to-chevron flakes with feathered terminations meeting at the midline.

At a magnification of  $20\times$ , minute unifacial step fractures are discernible on the left ventral tip margin of 28.0/5504. The tip was either used for scraping or has been unifacially ground. All margins are smooth, yet sharp.

Artifact 28.0/3202 (fig. 11g) is a stemless, wide ( $LM/WM = 2.0$ ), triangular ( $WB/WM =$

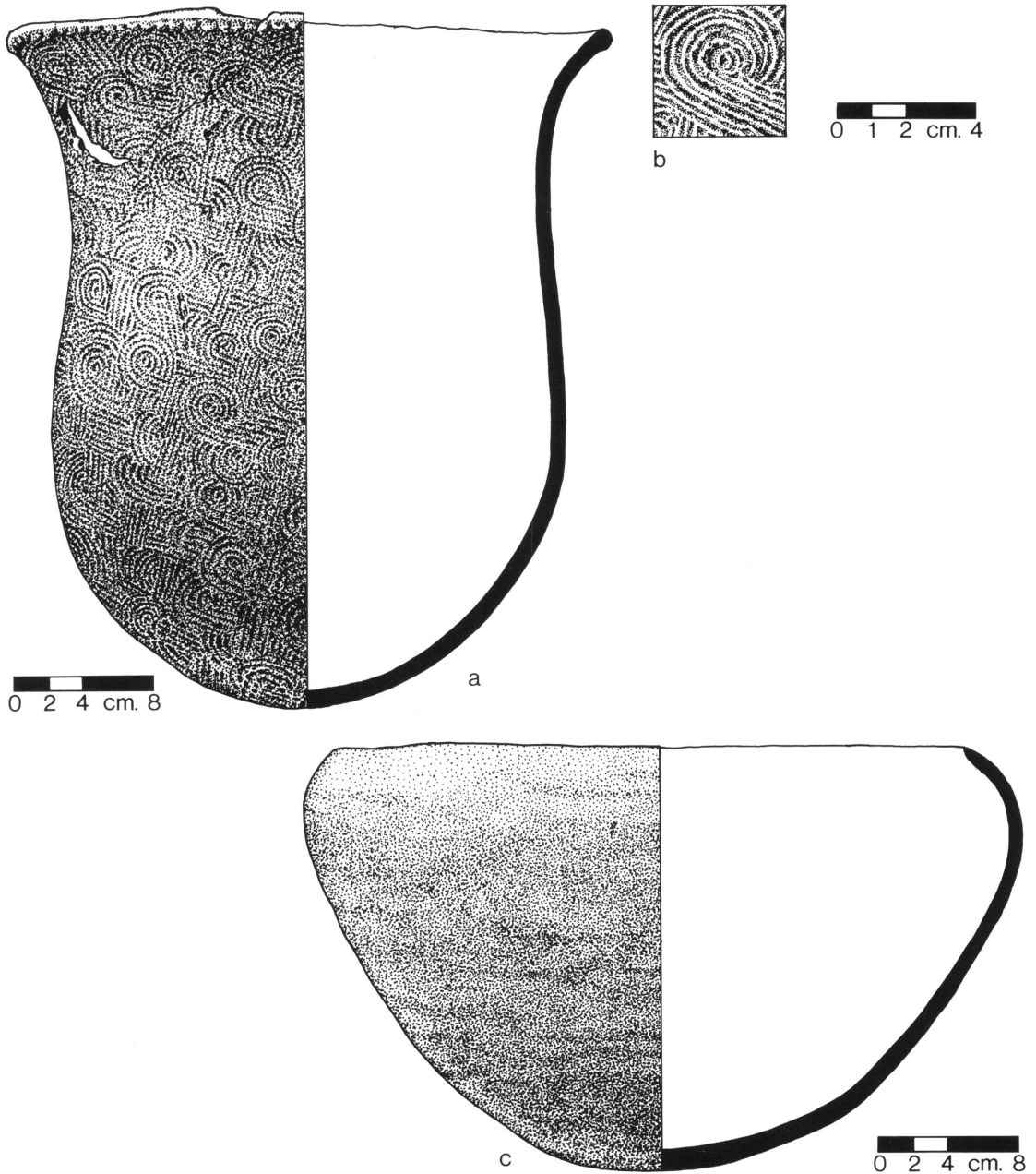


Fig. 9. Vessels from South End Mound I. **a.** Moore's Vessel Ca (Peabody Museum 48334), Irene Complicated Stamped burial urn; **b.** detail of **a**; **c.** Moore's Vessel Cb (Peabody Museum 48335), Irene Plain cazuela.

1.0) projectile point with a flat base. Both unbroken margins are straight. The tip and left ventral margin were broken by a heat spall, rendering the biface nonfunctional. This

point has a lenticular cross section ( $Th/WM = 0.27$ ) with homogeneous thickness. The lateral margins of 28.0/3202 are lightly polished ( $20\times$ ). The polish is directly on the margin,

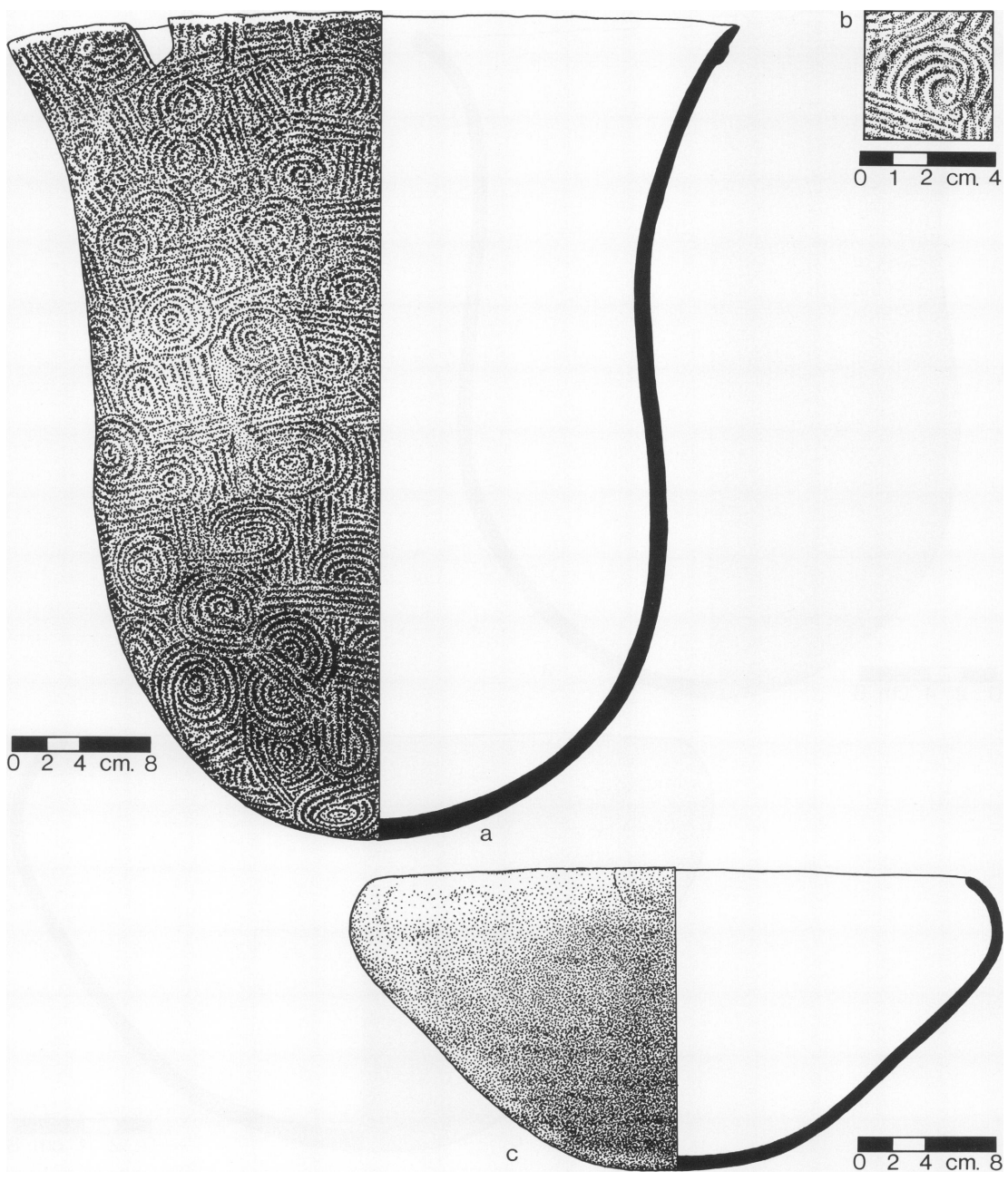


Fig. 10. Vessels from South End Mound I. **a.** Moore's Vessel Fa (American Museum 20/1565), Irene Complicated Stamped burial urn; **b.** detail of **a**; **c.** Moore's Vessel Fb (American Museum 20/1566), Irene Burnished Plain vessel.

suggesting a cutting/piercing function. What remains of 28.0/3202 appears to have been parallel flaked.

Artifact 28.0/5503 (not illustrated) is a

roundish white calcium carbonate pebble. It appears polished, probably from handling or water action. The pebble is unmodified (11.5 × 10.0 × 8.9 mm.). In the earlier ex-

TABLE 1  
Ceramic Frequencies at South End Mound I

Type	Frequency
Altamaha Line Block/Irene Filfot	1
Irene Complicated Stamped	68
Irene Plain	2
Irene Burnished Plain	11
Irene (type ?)	4
Irene segmented rim strip	1
St. Catherines Plain	2
St. Catherines Burnished Plain	1
Wilmington Plain	7
Wilmington Stamped	1
Wilmington (type ?)	3
Refuge Simple Stamped	1
Unidentified temper	1
Sand tempered	1
Sand tempered, plain	1
Sand tempered, decorated	2
Sand and grit tempered	1
Sand and grit tempered, brushed rim	1
Clay tempered, plain	1
Grit and clay tempered, stamped rim	1
Fiber and clay tempered	2
Total	113

cavations concentrations (“nests”) of similar pebbles were found in close proximity to Burials 2, 14, and 15 at South End Mound I. Moore (1897, p. 76–77) suggested that the

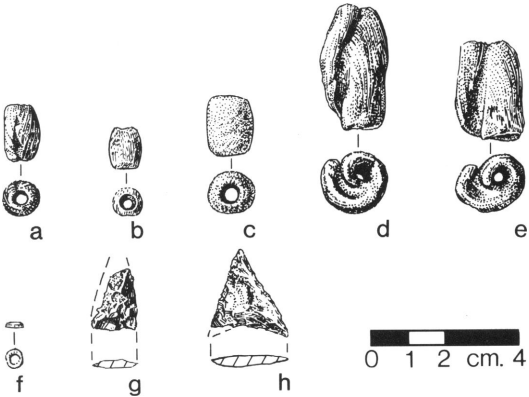


Fig. 11. Various shell and lithic artifacts from South End Mound I. a. 28.0/3203; b. 28.0/3204; c. 28.0/4225; d. 28.0/4241; e. 28.0/6006a; f. 28.0/6006b; g. 28.0/3202; h. 28.0/5504.

pebbles were the remains of a rattle, and 28.0/5503 probably functioned similarly.

Three unmodified flakes were recovered, each of a different colored chert. None of the cherts appears to match that of the projectile points described previously. All flakes are small; they are primarily shatter; none has a bulb of force. One is the distal end of a brown chert flake with crazing and heat spalls. The second is probably a small piece of gold chert core shatter, having four faces. Both of the

TABLE 2  
Bifacial Artifacts from South End Mounds I and II

Specimen Number	Provenience	Length Max. (mm.)	Length Axial (mm.)	Width Max. (mm.)	Width Basal (mm.)	Thick- ness (mm.)	Weight Actual (g.)	Weight Est. (g.)	Material
South End Mound I									
28.0/3202 <sup>a</sup>	Square G-11	(22.0)	(22.0)	11.9	11.9	3.3	0.5	0.7	Chert
28.0/5504 <sup>a</sup>	Square G-11	23.0	20.5	(22.5)	(22.5)	4.9	1.3	1.5	(Chert)
South End Mound II									
28.0/3304 <sup>a</sup>	Test Pit III	—	—	—	—	5.7	0.7	1.4	(Shell)
28.0/3565a <sup>a</sup>	Feature B	—	—	—	—	—	0.2	—	Chert
28.0/5508 <sup>a</sup>	Feature A	(25.0)	(24.3)	(20.5)	(20.5)	4.8	1.3	1.0	(Chalcedony)
28.0/5509a <sup>a</sup>	Square F-4	—	—	—	(25.0)	—	2.8	5.0	Chert
28.0/5509h <sup>a</sup>	Square F-4	—	—	—	—	—	0.2	—	Chert
28.0/5512	Feature A	30.1	30.1	21.8	21.8	4.6	1.9	1.9	(Calcite/limestone)
28.0/5515	Feature A	28.9	28.0	11.9	11.9	4.7	1.0	1.0	Chert
28.0/5516	Feature A	25.8	24.3	15.8	15.8	6.3	1.8	1.8	Chert
28.0/5517	Feature A	23.0	21.7	19.0	19.0	6.7	1.4	1.4	Chert
28.0/5573c	Feature A	—	—	—	—	3.4	0.4	—	Chert

<sup>a</sup> Fragmentary specimen.

TABLE 3  
Whelk Beads from South End Mound I

Specimen Number	Provenience	Length (mm.)	Width (mm.)	Perforation Diameter (mm.)	Weight (g.)
28.0/3203	Test Pit III	15.7	10.8	3.6	2.3
28.0/3204	Test Pit III	11.5	8.9	4.3	1.1
28.0/4225	Square G-9	16.2	13.2	4.6	3.7
28.0/4241	Square G-10	33.7	17.7	4.9	9.6
28.0/6006a	Square G-10	27.3	20.1	4.7	8.4
28.0/6006b	Square G-10	2.1	5.6	3.0	<0.01

above are interior flakes. The third flake is amber-colored secondary cortex shatter.

SHELL BEADS  
Lorann S. A. Pendleton

Moore's (1897) excavation report of this site states that "numerous" shell beads were found with various burials, with specific associations described for burials, 3, 5, 18, 19, 21, 30, 40, 41, 42, and 44. Six of these 10 burials were infants or children under five years of age. Although Moore rarely described specific cultural associations in detail, he noted that several individuals were found with beads at the neck and wrist. One burial contained beads at the neck and legs, and in

other cases, beads were found in burial urns with the bones (see fig. 3). Most of the beads described by Moore are made from "columnellae of the conch."

The AMNH excavations unearthed six additional whelk beads from South End Mound I (fig. 11a-e; see table 3 for metric and provenience data). Five of the beads are made from segments of the columella, generally the axis end of the whelk, including the anterior or siphonal canal. The axis is often left intact, with whorls and spirals visible on the side of the beads. It is detached from the shell, probably cut from the end with a flake. The bead blanks are then conically drilled as long tubes and cut at various lengths. The ends are smoothed and abraded around the perfora-

TABLE 4  
Identified and Unidentified Faunal Specimens per Taxon from South End Mound I

Provenience	Taxon						Unidentified Fragments	Totals
	<i>Odocoileus virginianus</i> (White-tailed deer)	Emydinae (Pond turtles)	Crotalidae (Rattle-snake)	Amphibia and Reptilia	Osteich- thyes (Bony fishes)	<i>Callinectes</i> sp. (Blue crab)		
Test Pit II	—	4	—	—	—	—	2	6
Test Pit III	14	24	—	—	—	1	134	173
Test Pit IV	—	3	1	—	1	—	8	13
Test Pit V	—	6	—	—	—	—	—	6
Test Pit VI	9	24	—	—	3	—	122	158
Test Pit G-9	10	6	—	2	1	—	9	28
Test Pit G-10	6 <sup>a</sup>	2	—	1	—	—	21	30
Test Pit G-11	—	3	—	—	—	—	20	23
No provenience	—	1	—	—	—	—	4	5
Totals	39	73	1	3	5	1	320	442

<sup>a</sup> Five of these fragments fit together.



tion but otherwise unmodified. The bead in figure 11f may be a disc bead.

### MODIFIED WHELK ARTIFACTS

Eight modified whelk shell artifacts were also recovered at South End Mound I. In all cases, the pointed end of the anterior canal was blunted, broken, or chipped; the outer lip was often damaged, sometimes entirely broken off. Three of the whelk tools had jagged holes in the body whorl and shoulder.

### NONHUMAN SKELETAL REMAINS

Deborah Mayer O'Brien

The reptile and amphibian faunal remains encountered in the excavation of South End Mound I were submitted for identification to Dr. Charles Crumly, Department of Vertebrate Zoology, NMNH. All remaining non-human remains were identified in the Laboratory of Archaeology, AMNH.

The number of identified elements per taxon are presented in table 4. All identified taxa are present on St. Catherines Island today.

One of the deer bones showed evidence of butchering, and three additional fragments were burnt. None of the nonmammalian bones were butchered; one turtle bone had been burnt. Three of the unidentifiable fragments were also burnt, and one showed signs of butchering.

## THE ARCHAEOLOGY OF SOUTH END MOUND II

Drawn to this area by the hope of the rediscovery of Moore's "Mound near South-end," we quite naturally conducted further reconnaissance at a nearby burial mound located 38 m. southeast of South End Mound I (fig. 1). This site was designated in our field notes as South End Mound II (AMNH 121) and was recorded as 9 Li 273 in the University of Georgia site files.

When discovered in 1979, this relatively undisturbed mound stood approximately 70 cm. high, and covered an area  $14 \times 17$  m. (fig. 12). The only visible postconstruction activity was the presence of two antebellum boundary ditches, which intersect the south-

### DISCUSSION

There is little doubt that South End Mound I was initially excavated by Clarence Bloomfield Moore in his five-month investigations of the Georgia coast during the fall and winter of 1896–1897. This assignment is confirmed not only by placement, but also by the extreme degree of subsurface disturbance noted in our test excavations and by the alignment of our contour map with Moore's published excavation map (fig. 5). After examining both the ceramics originally recovered by Moore (1897) and those recovered in our own excavations, we have no doubt that mortuary activities at this site were initiated and completed during the Irene phase of aboriginal occupation of St. Catherines Island.

None of the skeletal materials excavated by Moore, to our knowledge, were saved for later analysis, and we did not recover enough material from this site to warrant discussion of health, disease, and related variables in the human populations involved.

Our limited test excavations suggest that the bulk of these human skeletal materials remain buried within the disturbed mound fill. In fact, if our Burial A (Moore's Burial 22) is any indication, a large proportion of these burials may still be partially intact. If so, then additional excavations in South End Mound I might be warranted.

eastern and southwestern margins of the site, respectively. These ditches define the southern margin of Cunningham Field, one of a number of extant antebellum fields on St. Catherines Island (see Thomas et al., 1978, fig. 4).

This part of the island is low-lying, and standing water is not uncommon, particularly after hard or sustained rain. The surrounding vegetation is predominantly live-oak, with pine stands occupying the former field. A few swamp maple trees grow near South End Mound II; this tree is generally restricted to poorly drained areas on St. Catherines Island. No obvious midden sites were noted nearby,

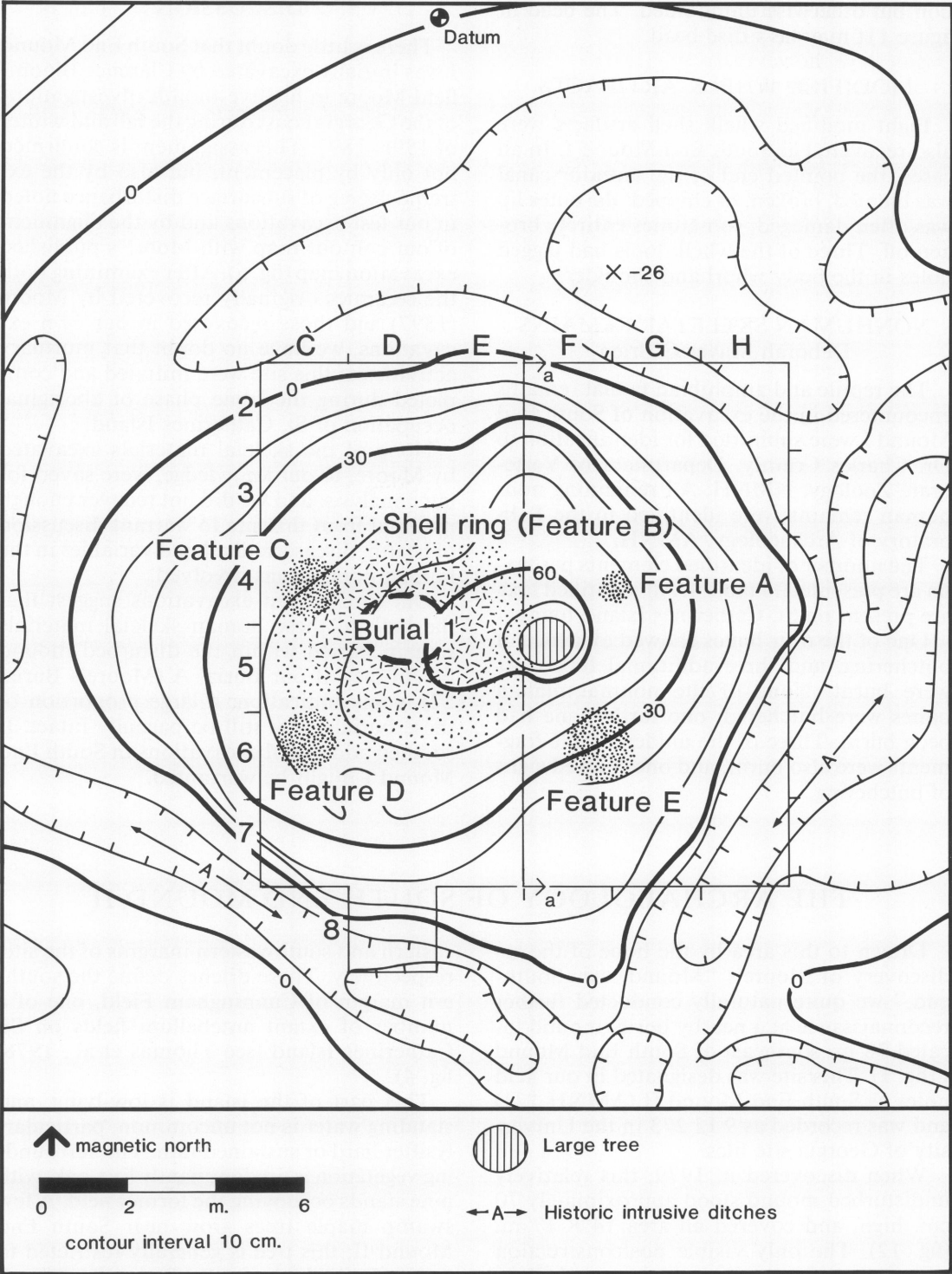


Fig. 12. Topographic map of South End Mound II. Note the lateral borrow pits and two antebellum ditches which intersect at roughly right angles and define the southern margins of the aboriginal mound.

perhaps because the high water table restricted potential areas of habitation. Midden deposits were, however, located within the fill of both mounds, suggesting that satisfactorily high ground was at a premium.

To Moore, the "Mound near South-end Settlement" (South End Mound I) must have been the most satisfying of those encountered on St. Catherines Island, and we wondered why there was no visible sign of previous excavation in so well-defined a mound located nearby. When we first visited the site, a large live-oak tree was growing in the center of the mound. The tree appeared to be quite old, and we wondered if perhaps the presence of such a large tree may have discouraged Moore from excavating this mound.

In the process of clearing the site for our excavations, this tree was cut down, and we had an opportunity to examine it in cross section. Although it is difficult to obtain an exact count, the visible tree rings showed that the tree could not have been more than 80 or 90 years old. That is, even if the tree had been present in the 1890s, it must have been a mere sapling—surely no obstacle to excavation in Moore's day.

We remain puzzled as to why such an obvious burial mound was left untouched by the peripatetic Mr. Moore.

### EXCAVATION STRATEGY

The AMNH began investigation at this mound in November 1979. The site was cleared and a 2 m. grid system imposed across the elevated portion. A topographic map was prepared at the time with plane table and alidade.

Note particularly the well-defined borrow pits surrounding South End Mound II (fig. 12); the circular pit to the north and west probably resulted during the prehistoric mound construction phase; the linear borrow pits, perpendicular to one another, were created when the antebellum field ditch was excavated.

We initially explored the mound by digging five contiguous 1 m. squares, oriented along the north-south D trench (fig. 12). All deposits encountered in this early test excavation were troweled and passed through a  $\frac{1}{4}$  in. screen. We found very little cultural debris in the mound fill, and the November exca-

vation was terminated when human bones (Burial 1) were located at a depth of approximately 115 cm. below the surface (at the approximate level of the initial humus zone).

The test squares were excavated again in March 1980, with the express purpose of penetrating the original humus zone. These deposits were screened as well; the primary north-south profile was drawn and photographed during this brief field season.

These tests were sufficiently promising so that full-scale excavations were begun by the AMNH the following May. The strategy of this excavation was twofold: to provide additional stratigraphic sections near the center of the mound, and also to excavate a sufficiently large central area so that features and burials could be exposed and related to one another.

To do this, the previous 1 m. test squares were enlarged to correspond with the 2 m. grid system, and all subsequent excavation proceeded in 2 m. squares (see fig. 12). Based on the previous tests, we decided to excavate primarily by careful shovel scraping; only feature fill was screened after this point.

All units in trench D were extended, creating a linear exposure of 14 m.; they were excavated well into the primary humus, and the area was inspected for pits. Trenches C and E were then excavated to a length of 12 m.

Although excavation of South End Mound II was a relatively straightforward operation, progress was significantly hampered by the lack of drainage. This area is always poorly drained, and the unusually high water table in 1980 created serious problems. When we returned to continue test excavations in March 1980, we found our test pits filled with more than a foot of water. During the May 1980 excavations, the site was inundated even further. To solve the drainage problem, a portable gas-powered Marlow water pump was employed to drain the site on a continuing basis. One square on the south margin of the site (square D-8) was excavated as a sump.

We returned to South End Mound II for further and final excavations in May 1981, at which time three additional 12 m. long trenches (F, G, and H) were opened to the east of the 1979-1980 excavation (fig. 12). Fortunately, 1981 was a relatively dry year

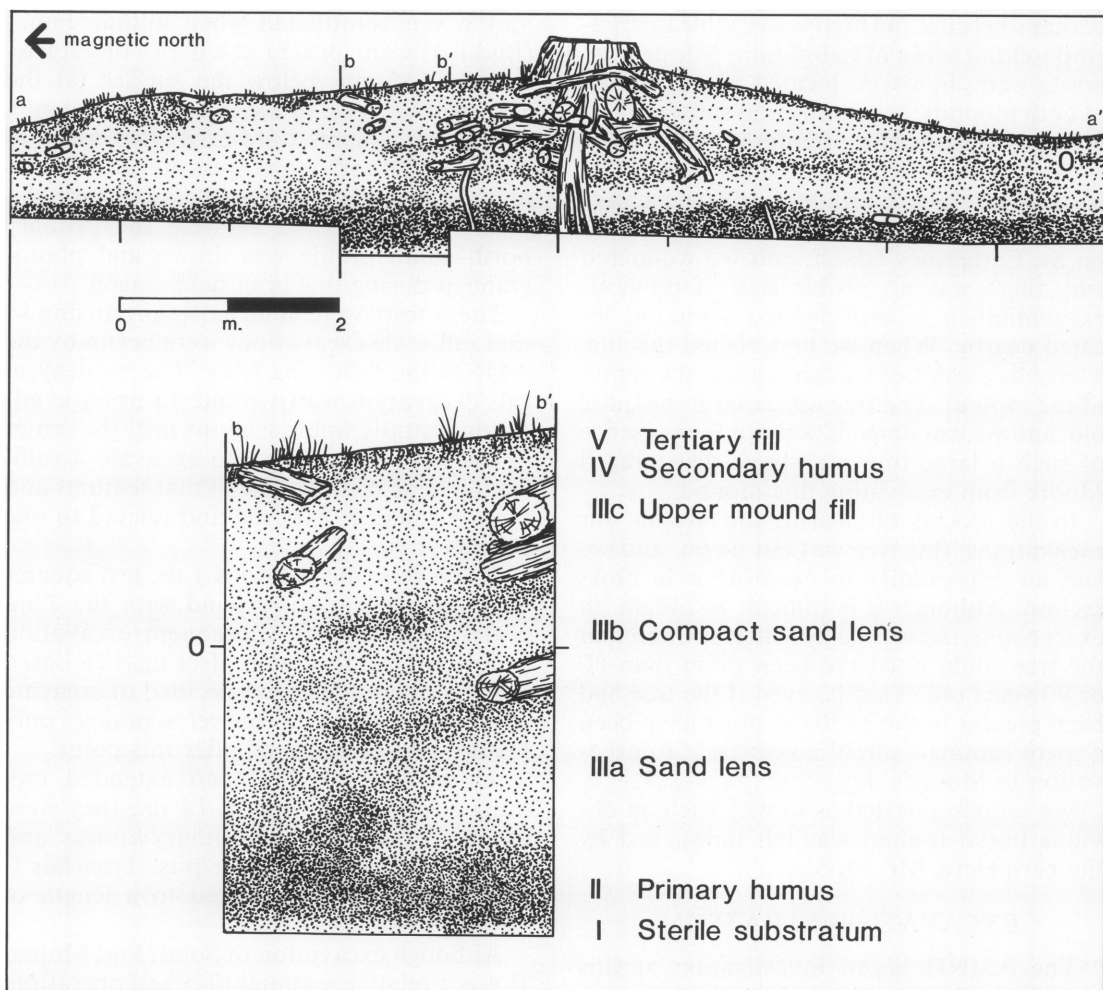


Fig. 13. Stratigraphic profile of South End Mound II; section taken between a and a' in figure 12.

and we were not hampered by the problem of standing water.

In all, 37 2 × 2 m. squares were dug into South End Mound II, resulting in nearly total excavation of this mortuary locality.

### STRATIGRAPHY AND FEATURES

The master stratigraphic section profile of South End Mound II is presented in figure 13 (see also table 5). This stratigraphic description uses nomenclature previously employed for the burial mounds of St. Catherines Island (Thomas and Larsen, 1979; Larsen and Thomas, 1982).

The entire mound is underlain by a cul-

turally sterile substrate (Unit I) which is capped by a well developed, very dark gray stained zone of primary humus; both strata can be attributed to Pleistocene and early Holocene soil horization.

More than two dozen St. Catherines period potsherds were found scattered about this surface, in no particular concentration. The St. Catherines period is conventionally assigned the interval from A.D. 1000 to A.D. 1150 (expressed in uncorrected radiocarbon years B.P.) in the north coastal Georgia cultural chronology (DePratter, 1979). The presence of these sherds strongly suggests that construction of South End Mound II could not have occurred prior to A.D. 1000.

TABLE 5  
Measured Stratigraphic Section of South End Mound II  
(For location of section see fig. 12.)

Unit	Thick- ness (cm.)	Description
V	see text	<i>Tertiary fill</i> , dark sand from his- toric ditch.
IV	10	<i>Secondary humus</i> , very dark brown sand, extremely dense root mat (10 YR 2/2: dry), formed as A horizon of Unit IIIc. Contact abrupt.
IIIc	35-40	<i>Upper mound fill</i> , light gray sand (10 YR 6/1: dry), mottled in places, with occasional char- coal flecks.
IIIb	25-30	<i>Compact sand lens</i> , tan sand (7.5 YR 3/2: dry), extremely compact and slightly mottled in appearance; shell occurs elsewhere in profile but not in the existing section. Contact irregular and gradual over 10 cm.
IIIa	25-30	<i>Sand lens</i> , light gray sand (10 YR 7/2: dry), very slightly mottled throughout the site; appears somewhat lighter in western margin of profile; charcoal virtually absent. Contact very abrupt.
II	?	<i>Primary humus</i> , black sand (10 YR 2/1: dry), very slightly mottled with charcoal flecks rare; formed as A horizon of Unit I.
I	?	<i>Sterile substratum</i> , very ex- posed. Dark, hard-packed sand. Bottom not exposed.

Another pre mound artifact assemblage was found on top of the primary humus in the southeastern corner of square F-4. This apparently deliberate cache, designated as *Feature A*, is an artifact concentration restricted to a tightly circumscribed area of roughly 1600 sq. cm.;<sup>2</sup> although no pit outline was apparent, the contexts certainly suggest a single, purposeful event. Feature A contains 10 projectile point/biface fragments (fig. 22), four quartzite hammerstones (fig. 21), 39 percussion flakes, a small concentration of red ochre (probably hematite), and a single St. Cath-  
erines Burnished Plain sherd.

STAGE I

Sometime after A.D. 1000, a Central Pit roughly 20 cm. deep and 6 m. in diameter was excavated into the primary humus. Two concentrations of previously cremated human bone (*Cremations A and B*) had been placed therein (fig. 14); there is no evidence of in situ firing. Then a mass interment containing the disarticulated bones of at least 15 individuals (designated as *Burial 1*) was put into the pit.

An impressive range of artifacts was deposited in direct association with Burial 1. On the southern margin was a rather decomposed copper sheet (fig. 21g), a perforated and polished diabase-like pendant or gorget (fig. 21a), and a river otter mandible. A copper earspool (fig. 21f) and a biface tip (fig. 22) were also found associated, plus 45 small galena cubes. In addition, 15 masses and fragments of decomposed galena were recovered throughout. These artifacts are described below.

<sup>2</sup> *Feature A* at South End Mound II was termed "Feature 2" in our field notes.

TABLE 6  
Radiocarbon Determinations from South End Mound II

Laboratory Number	Provenience	Raw Determination <sup>a</sup>	Calendric Date (uncorrected)
UGA-3458	Shell from Feature B	865 ± 75 B.P.	A.D. 1085
UGA-3459	Shell from Feature B	645 ± 70 B.P.	A.D. 1305
UGA-3460	Charcoal from Unit IIIc	2135 ± 170 B.P.	185 B.C.
UGA-3461	Charcoal from Unit V	225 ± 65 B.P.	A.D. 1725

<sup>a</sup> Expressed in radiocarbon years before 1950.



The Central Pit was then covered with a distinctive layer of light gray, mottled sand (Unit IIIa), uniformly deposited across the burial pit and primary humus zone. This sand lens is approximately 25 cm. thick and appears as an irregular, artificially raised platform covering the southern two-thirds of the excavated area (see fig. 13).

Unconformably draped directly atop Unit IIIa was a second lens, comprising secondary shell midden and tan sand. The entire surface had then been intensively burnt. This layer of secondary midden is denoted in the stratigraphic profile as Unit IIIb, and also termed *Feature B*.<sup>3</sup> The shell lens is roughly circular, about 6 m. in diameter, and up to 40 cm. thick. Only the upper part of this midden feature shows evidence of firing, and the zone of reddish-brown oxidized sand extends about 1 m. beyond the shell lens. The midden feature, extending in places well below the primary humus, contains mostly oyster shell, although mussels, clams, and pond turtle bone were also contained therein. Strictly St. Catherine's period potsherds are included in the shell lens.

Two radiocarbon determinations are available from oyster shells contained within the shell lens:  $865 \pm 75$  B.P. [A.D. 1085] (UGA-3458) and  $645 \pm 70$  B.P. [A.D. 1305] (UGA-3459). The radiocarbon and ceramic evidence is thus generally consistent.

This lens appears to have been subaerially exposed for an interval of unknown duration. A distinctive concentration of 87 flakes (described below) was found atop this secondary midden unit (in the western part of square D-5).

## STAGE II

Final mound construction (represented by Unit IIIc) followed, during which South End Mound II assumed roughly the contours evident in figure 12. The Unit IIIc fill contained a few redeposited St. Catherine's period potsherds.

A single radiocarbon date is available from a large charcoal chunk included in Unit IIIc:  $2135 \pm 170$  B.P. [185 B.C. (UGA-3460)]. This

determination is far too ancient to accurately date Stage II mound construction; it conflicts with the other dates available in the strata underlying and overlying Unit IIIc. This charcoal probably resulted from a much earlier burning of the primary humus, and then was redeposited in secondary context during Stage II mound building.

An intrusive, undated pit was encountered in square C-4. *Feature C* is irregularly shaped, 80 cm. in depth, and measures 135 cm. (east-west) and 74 cm. (north-south). Originating about 15 cm. below the surface of the mound, immediately to the west of Burial 1 (which was undisturbed), this pit pierced the shell lens and intruded upon it.

Not far away, in square C-6 is *Feature D*, a shallow pit about 140 cm. in diameter. The top of this feature is obscured, and disturbance did not extend to the level of the primary humus.

Sometime after the deposition of mound fill, a poorly developed zone of secondary humus (Unit IV) developed across the entire mound surface.

## ANTEBELLUM PERIOD DISTURBANCE

Finally, another filling episode (Unit V) took place along the southern part of the exposure (fig. 13). This event almost certainly represents backdirt that accumulated during excavation of the antebellum field boundary ditches that intersect the southeastern and southwestern regions of the mound. A dense root mass covers most of the mound surface and extends beneath this later fill, suggesting a relatively short time interval between the formation of the secondary humus (Unit IV) and deposition of Unit V. This interpretation is supported by a radiocarbon determination processed on a large piece of charcoal included in Unit V:  $225 \pm 65$  B.P. [A.D. 1725] (UGA-3461).

A circular pit, termed *Feature E*, was encountered in unit F-6, along the eastern margin of the excavation area.<sup>4</sup> The top of this disturbance began about 15 cm. above the lower contact of Unit V fill. The pit is 95 cm. in diameter and about 50 cm. deep; the basal

<sup>3</sup> *Feature B* at South End Mound II was termed "Feature 1" in our field notes.

<sup>4</sup> *Feature E* at South End Mound II was termed "Feature 3" in our field notes.

portion penetrated the primary humus. Feature E was almost certainly dug by relic collectors sometime after the construction of the boundary ditches.

### HUMAN SKELETAL REMAINS

All human remains in South End Mound II were found in an area of extremely high water table, seriously hampering removal of the clay matrix adhering to the bones. Laboratory analysis was further complicated by the fact that the individual skeletal elements were very fragmentary, thereby preventing, in many instances, determination of sex and age.

Analysis of the human remains focused primarily on determining the minimum number of individuals, estimating sex and age, and noting pathology. In addition, a battery of dental and skeletal metric data was collected following procedures outlined in Thomas and Larsen (1979) and Larsen (1982).

Summaries of skeletal and dental elements present in Burial 1 are provided in tables 7 and 8, respectively. Ten adult human crania (A–K)<sup>5</sup> were exposed in this burial, but given their very fragmentary condition, we are unable to present cranial metric data of any sort. Likewise, it was not possible to record measurement data for most of the postcranial remains, but the few metric observations made are summarized in table 15 (Appendix). Dental metric data are provided in table 17 (Appendix).

From the enumeration of individual adult and preadult skeletal and dental elements, at least 15 individuals seem to be represented in the South End Mound II skeletal series. That is, based on the number of femur shafts, there are 13 adults and 1 infant. Based on the dental sample alone, 11 adults and 2 infants are represented in this sample.

Although the fragmentary nature of these materials makes it difficult to identify individual sex, morphological characteristics of the cranial bones (cf. Ubelaker, 1984), indicate that at least three females and one male are included in this burial sample. Six crania

TABLE 7  
Human Skeletal Elements from South End Mound II

Bone	Left	Side (?)	Right
<b>Long Bones</b>			
Humerus	1	13+	1
Radius	—	3+	—
Ulna	—	1+	—
Femur	1	26	—
Tibia	6+	1	5+
Fibula	—	12+	—
<b>Irregular Bones</b>			
Clavicle	—	1	—
Scapula	—	4+	—
Sternum	—	—	—
Innominate	—	2+	—
Patella	—	—	—
Rib	—	1+	—
<b>Vertebrae</b>			
Cervical	—	4+	—
Thoracic	—	1+	—
Lumbar	—	—	—
Sacrum	—	1	—
<b>Hand Bones</b>			
<b>Carpals</b>			
Scaphoid	1	—	1
Lunate	—	—	1
Triquetral	—	—	—
Pisiform	—	—	—
Greater multangular	—	—	—
Lesser multangular	—	—	—
Capitate	—	—	1
Hamate	—	—	—
Metacarpals	—	9+	—
Phalanges	—	35+	—
Sesamoid	—	1	—
<b>Foot Bones</b>			
<b>Tarsals</b>			
Calcaneus	—	4+	—
Talus	1	—	—
Cuboid	—	1+	1
Navicular	—	—	—
Cuneiforms (1–3)	—	—	—
Metatarsals	—	1+	—
Phalanges	—	20	—
Crania	—	10	—
Mandibles (isolated)	—	4	—
Maxilla (isolated)	—	1	—
Hyoid	—	1	—

<sup>5</sup> Laboratory examination of Skull F showed that this is not a human cranium, but rather, a globular-shaped concentration of decomposed galena.

TABLE 8  
Human Dental Elements from South End  
Mound II

Tooth Mandib- ular			Tooth Maxil- lary			Total
	Left	Right		Left	Right	
I1	3	1	I1	3	2	9
I2	3	2	I2	3	3	11
C	3	8	C	2	1	14
P3	6	8	P3	5	3	22
P4	5	6	P4	4	2	17
M1	9	8	M1	7	6	32
M2	8	8	M2	5	5	26
M3	5	6	M3	5	2	18
dI1	0	0	dI1	0	0	0
dI2	0	1	dI2	0	0	1
dC	0	0	dC	0	2	2
dM1	1	0	dM1	0	1	2
dM2	0	0	dM2	0	0	0
Total	—	—	—	—	—	154

were too fragmentary for sex determination. It was possible to estimate specific or general ages for the adult remains. Both of the two infants that are represented by teeth were between one and three years of age at death (cf. Ubelaker, 1984). The infant that is represented by postcranial remains was between one and two years of age at death (cf. Ubelaker, 1984).

Because no in situ anatomical articulations were noted, it is quite likely that the soft tissues for all individuals were completely decomposed prior to final interment. It was not, therefore, possible to calculate length of time that this feature had been in use based on relative stages of decomposition (see discussions in Ubelaker, 1974, 1984; Thomas and Larsen, 1979).

Two large areas of burnt human bone were exposed directly beneath the unburnt re-

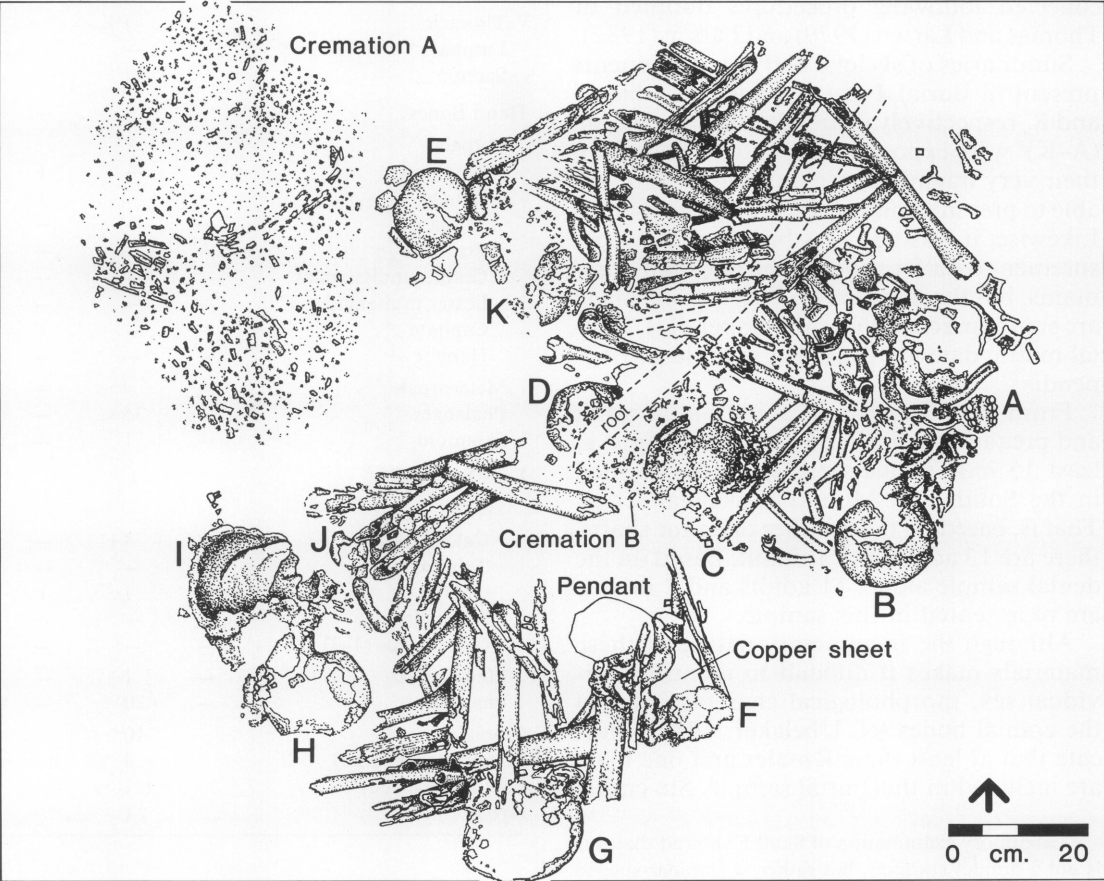


Fig. 14. Detail of Burial 1 at South End Mound II. Individual burials are denoted by letters.

mains discussed above. These two concentrations are designated *Cremation A* and *Cremation B* (fig. 14). The bones were extremely fragmentary, preventing any anatomical reconstruction. Although most of the individual bones of the human skeleton were present, the materials were largely unidentifiable as to bone type. Degree of firing ranged from blackened to completely calcined. Controlled laboratory experiments by Van Vark (1970; see also Stewart, 1979; and Shipman et al., 1984) suggested that temperatures in excess of 800°C are required to calcine bone. The bone in *Cremation A* weighed 2631 g.; bone in *Cremation B* weighed 9258 g.

#### PATHOLOGY

Clark Spencer Larsen and  
Dale L. Hutchinson

The only pathologies observed in the human remains from South End Mound II occurred on the dentition. One maxillary right lateral incisor is abnormally small. Ortner and Putschar (1984) pointed out that this trait is associated with a number of congenital conditions, including heart disease, Down's syndrome, and cleft palate. One maxillary right fourth premolar is rotated approximately 90° clockwise from normal tooth position. Although the associations for this congenital condition are not understood, its presence has been well documented in the archaeological record, including the Georgia coast (cf. Larsen and Thomas, 1982; Larsen, unpublished). Only one tooth (of the 154 recovered from South End Mound II) shows cariogenic decay, strongly suggesting that the dietary regimen for these people was low in carbohydrates, especially sugar, and, consequently, they enjoyed relatively good dental health.

Markers of growth arrest known as enamel hypoplasias were utilized to further assess levels of stress in the South End Mound series. Enamel hypoplasia is an area on the tooth crown deficient in enamel, manifested by pitting, linear furrowing, or in extreme cases, total absence of enamel (cf. Bhaskar, 1980). The deficiency in enamel development usually arises as a result of some type of metabolic insult, either disease or malnutrition or an interaction between the two. Because enamel is deposited in consecutive layers from

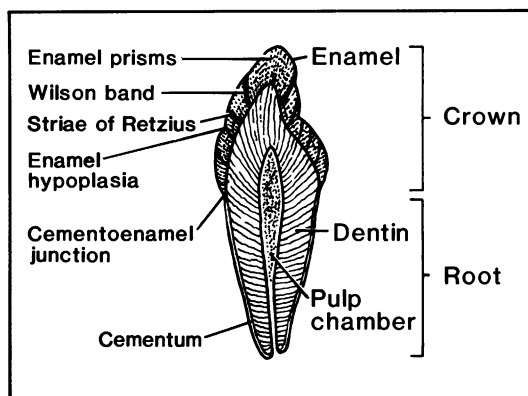


Fig. 15. Reference points on human dentition.

the occlusal surface to the cervical region of the tooth (see fig. 15), the width of the hypoplastic zone can be used to assess the duration of stress. That is, a wide hypoplastic zone represents a stress event of relatively greater duration than a hypoplastic zone that is narrow (see Blakey and Armelagos, 1985; Hutchinson and Larsen, 1985).

Teeth from 13 individuals in the South End Mounds were selected for observations of enamel hypoplasias. For comparative purposes, teeth from 59 individuals from other St. Catherines Island mounds were also studied (table 9). Teeth were cleaned with acetone, and the labial surfaces were observed with a stereozoom binocular microscope at a fixed power of approximately 10×. The hypoplastic bands were measured using a micrometer set in the eyepiece of the microscope. The teeth observed were mandibular and maxillary central incisors (I1), lateral incisors (I2), canines (C), and first molars (M1).

Observations of enamel hypoplasias showed that individuals affected by at least one hypoplastic event were less common in the South End sample (fig. 16). Measurement of area of hypoplasia within half-year increments<sup>6</sup> shows that the mean area of hypoplastic event was less in comparison with the other mounds on St. Catherines Island (fig. 17). Finally, duration of episodes as measured by total width (fig. 18) was generally shorter in the South End Mound sample.

Based on the study of enamel hypoplasias,

<sup>6</sup> Half-year increments were measured following Swärdstedt (1966) as modified by Goodman et al. (1980).

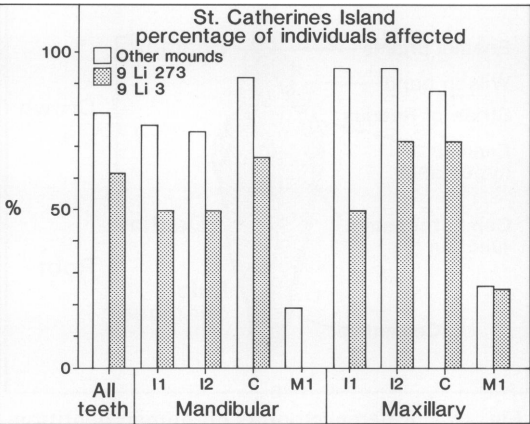


Fig. 16. Frequency of hypoplastic events.

it would seem that the individuals represented by remains in the South End Mounds were subjected to a lower level of stress resulting in metabolic insult. But before drawing such a conclusion, it should be pointed out that the sample of teeth available from the South End Mounds is very small, and therefore we feel that results at this point are preliminary. Additional teeth should be observed from other sites on the Georgia coast before conclusions are drawn based on analysis of hypoplastic data.

METALLIC ARTIFACTS

COPPER SHEET (28.0/3568)

The copper sheet found in direct association with Burial 1 measured 12.1 cm. in length

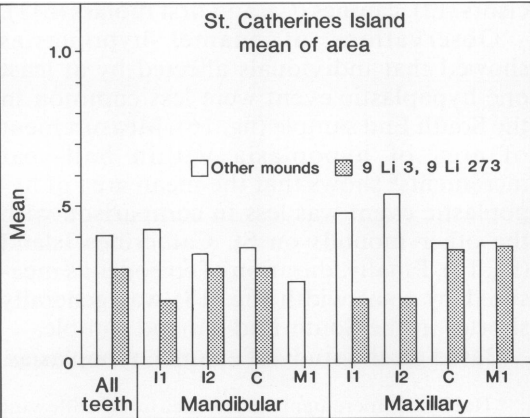


Fig. 17. Mean area of hypoplasia.

TABLE 9  
Dental Sample Employed in Hypoplasia Study

Num-ber of Indi-vid-u-als	Site Name	Period
2	Cunningham Mound C <sup>a</sup>	Refuge-Deptford
2	Cunningham Mound D <sup>a</sup>	Refuge-Deptford
1	Cunningham Mound E <sup>a</sup>	Refuge-Deptford
11	McLeod Mound <sup>a</sup>	Refuge-Deptford
8	Seaside Mound I <sup>a</sup>	Refuge-Deptford
5	Seaside Mound II <sup>a</sup>	Refuge-Deptford
2	Marys Mound <sup>b</sup>	St. Catherines
28	Johns Mound <sup>b</sup>	St. Catherines
1	South End Mound I <sup>c</sup>	Irene
12	South End Mound II <sup>c</sup>	St. Catherines/ Savannah

<sup>a</sup> Thomas and Larsen (1979).  
<sup>b</sup> Larsen and Thomas (1982).  
<sup>c</sup> This volume.

and 7.8 cm. in breadth prior to removal from archaeological context (fig. 21g). Removal was made especially difficult by the high water table and the presence of the otter mandible on the upper surface. The copper sheet was submitted to the Conservation Laboratory (Department of Anthropology, AMNH) for reconstruction and stabilization.

The fragment consists of a thin sheet of greenish-brown copper; its outer surface is pitted and corroded. The margins are

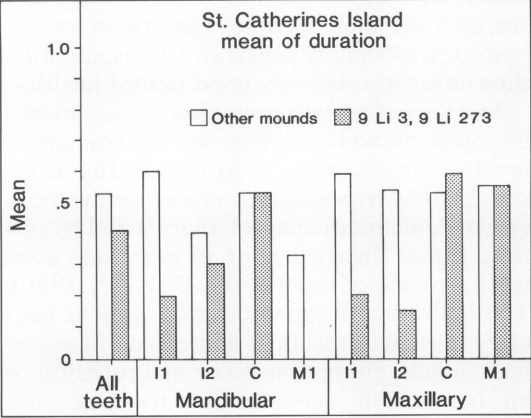


Fig. 18. Duration of hypoplastic events.



smoothly ground and flattened. On the inner border of this flattened surface are at least six well-defined punctated impressions, forming a uniform, linear sequence, 4.8 cm. in length (similar to artifacts in Larson, 1958, fig. 2D, E). Radiographic examination revealed that these impressions completely penetrate the sheet surface.

The copper sheet was found in direct contact with human rib, vertebra, and scapula fragments. Although this association would seem to suggest an upper thoracic placement, the disturbed nature of the burial prohibits more detailed speculation as to usage.

#### COPPER EARSPOOL (28.0/3566)

A broken copper earspool was also found associated with Burial 1 at South End Mound II (fig. 21f). Although the central, concavo-convex cup is intact, the peripheral edges are corroded away. The earspool appears to have been fashioned from two separate thin sheets of copper, hammered and fused together; areas of separation are evident. The convex side terminates at an apex in the form of an open cone. The longest dimension is 4.2 cm.; width is 3.6 cm.; thickness is 1 mm.; and height is 1 cm., measured at the apex of the cone.

The sides and edges of this cone are raised and slightly flared, probably indicating attachment to the corresponding cone that formed the opposite side.

#### GALENA CUBES

Forty-five small galena cubes were found associated with Burial 1. An additional 15 galena masses were recovered in this feature, presumably fused as the result of preinterment burning. The intact galena cubes are extremely regular, most of them formed along natural lines of cleavage. They range from 6.0 to 20.6 mm. long, 5.2 to 14.5 mm. wide, and 4.7 to 12.2 mm. thick. Weight varies from 0.6 to 9.9 g.

#### PRELIMINARY CONSTITUENT ANALYSIS OF METALLIC ARTIFACTS

The co-occurrence of galena and copper artifacts at South End Mound II is of some interest. Heretofore, prehistoric copper has

been rarely reported in archaeological contexts from this area, and, to our knowledge, this is the first occurrence of galena in coastal Georgia. Analysis of such exotic burial furniture has proven useful for interpreting prehistoric exchange networks.

For nearly a century, the archaeological distribution of prehistoric copper in the New World (Olsen, 1962; Friedman et al., 1972; Fraikor et al., 1971; Franklin et al., 1981) and the southeastern United States in particular (Moore, 1894; Hurst and Larson, 1958; Jefferies, 1976) has been of scholarly interest. Of special importance is the work of Sharon Goad (1978, 1980) who used chemical analysis to define source areas for the ores used for aboriginal copper artifacts in the Southeast. She found that sources in the Great Lakes and the southern Appalachians were apparently utilized differentially through time. During the Middle Woodland period, most artifacts were made from Great Lakes copper sources; during the Late Woodland/Mississippian periods, the majority of artifacts seem to have been manufactured from Southeastern sources.

In an attempt to derive comparable evidence, we conducted elemental analysis of metallic artifacts recovered from South End Mound II. Prior to final treatment of the copper sheet, a preliminary microprobe analysis of the object was performed at the AMNH. These results confirmed that the artifact was copper, but analysis revealed an unusually high degree of lead content. Given the concentration of galena in the immediate vicinity of the sheet, the high lead content is most likely due to contamination. Other elements noted in the elemental analysis were phosphorus, silicon, iron, aluminum, sodium, calcium, and chlorine.

The copper sheet and earspool were subsequently sent to the Conservation Laboratory at the Metropolitan Museum of Art for a more detailed elemental analysis. X-ray fluorescence analysis at the Metropolitan Museum confirmed the high percentage of lead in the sheet (13.0%), whereas the earspool showed a much lower lead content (2.6%). It is important to note that no galena was found in association with or in the surrounding area from which the earspool was recovered in Burial 1.

TABLE 10  
Elemental Analysis of Copper Artifacts from  
South End Mound II

Element	Weight (%)	Atomic (%)	Precision (2 sigma)	K-Ratio
Artifact 28.0/3568				
Silicon	14.63	26.03	0.39	0.0770
Phosphorus	8.36	13.49	0.29	0.0467
Sulfur	4.21	6.57	0.19	0.0278
Potassium	0.29	0.37	0.05	0.0026
Calcium	7.34	9.16	0.23	0.0731
Titanium	0.69	0.72	0.08	0.0072
Copper	51.51	40.53	0.89	0.6570
Lead	12.97	3.13	0.51	0.1085
Artifact (28.0/3566)				
Aluminum	5.00	7.70	0.20	0.0215
Silicon	26.58	39.34	0.40	0.1522
Phosphorus	8.06	10.82	0.23	0.0428
Sulfur	1.12	1.45	0.08	0.0073
Calcium	7.05	7.31	0.16	0.0090
Titanium	0.76	0.66	0.06	0.0090
Iron	2.90	2.16	0.13	0.0436
Copper	45.91	30.04	0.65	0.6209
Lead	2.63	0.53	0.18	0.0216

Although these results do not allow us to pin down the source of the copper utilized on St. Catherines Island, some light is shed on the problem. A total of 12 elements were detected in the combined analyses—silicon, phosphorus, sulfur, potassium, calcium, titanium, copper, lead, iron, aluminum, sodium, and chlorine—but only the former eight were analyzed quantitatively (table 10).

Schneider (ms.) found silver and arsenic in Great Lakes area ores, but neither element was detected in the South End Mound II copper artifacts. Bromine was present in Tennessee ores, but not in those from Georgia; bromine was similarly lacking in the South End Mound II copper artifacts. Iron was found in interior Wisconsin ores, but not in those from the Great Lakes/Michigan area; traces of iron were also detected in the South End Mound II copper artifacts.

Apparently, the St. Catherines Island artifacts contain elemental profiles characteristic of both Appalachian and Great Lakes area copper sources. Since we are analyzing only two artifacts, it seems unwise to attempt

to pinpoint the specific copper source contributing raw materials for copper artifacts recovered at South End Mound II.

Elemental analysis of galena from archaeological deposits and source areas is also potentially useful for identifying prehistoric exchange networks in the eastern United States (cf. Walthall et al., 1979, 1980, ms.; Walthall, 1981). Walthall and co-workers have analyzed a large series of galena sources and artifacts in eastern North America and found that there were two major prehistoric source areas: the upper Mississippi Valley and southeastern Missouri (Potosi). Moreover, they found that the former galena deposits were primarily used during the Middle Woodland period. In the Mississippian period, use of these deposits dropped off greatly, and the more southerly southeastern Missouri (Potosi) deposits became the primary mining source. These results parallel those of Goad (1978, 1980), who noted a similar shift in exploitation of northern deposits to southern ones by Late Woodland/Mississippian times. These parallel developments may, in fact, reflect systematic shifts in collection and trade of exotic items.

One galena cube was sent to Ralph Bailey of the Department of Geology, Northern Illinois University, for elemental analysis. Energy dispersive spectrometry (EDS) was conducted with a Kevex 7000 instrument, and the profile is shown on figure 19.

The back scatter electron image (BEI) of the same galena cube disclosed particularly high levels of silicon (fig. 20). The lightest area (a) in figure 20 is nearly pure lead sulfide. The gray zone (b) appears to be weathered lead sulfide, and the black concentration (c) is a silica inclusion. This unusually high level of silica may prove useful in future studies of archaeological galena.

But the sample size in this investigation is so small that we are unable to say with any degree of precision which of the eastern United States source areas is involved. One is tempted to speculate that both galena and copper were obtained from southeastern sources, thus reflecting the shift from northern to southern source utilization as we approach Late Woodland and Mississippian times. But until a larger sample is obtained

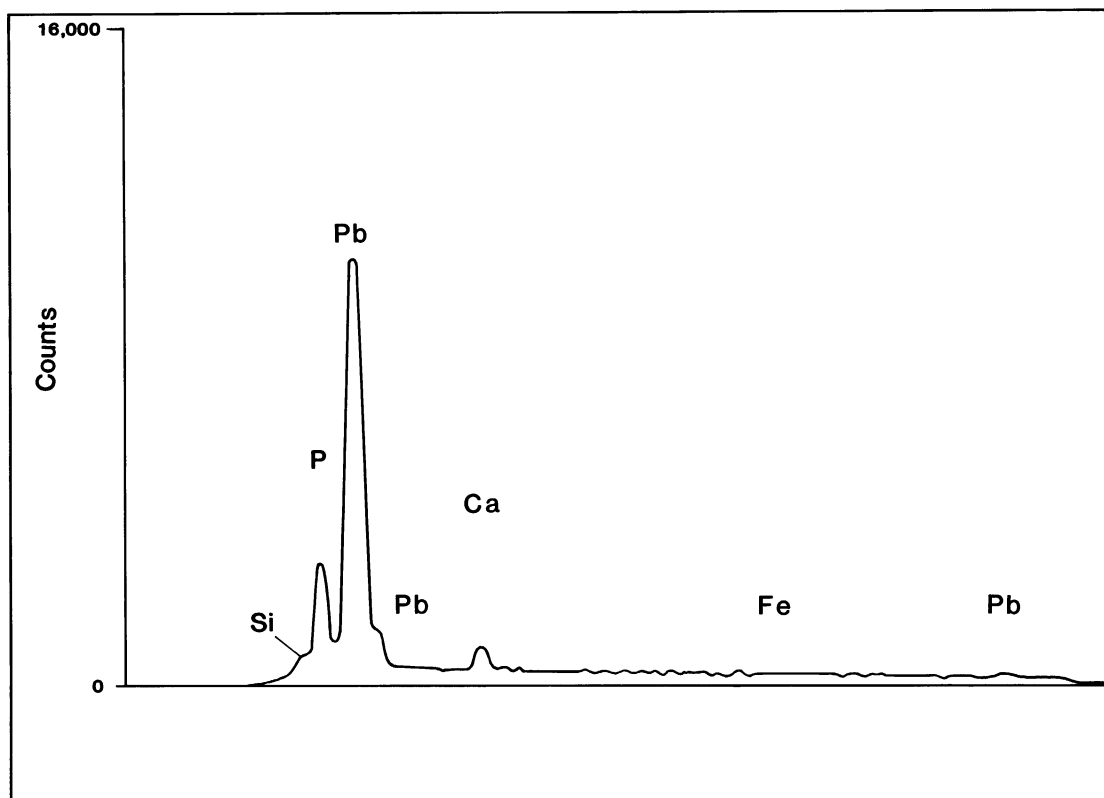


Fig. 19. Energy dispersive spectrometry (EDS) analysis of galena from South End Mound II.

from St. Catherines Island, we are left with speculation.

### LITHIC ARTIFACTS Lorann S. A. Pendleton

#### STONE PENDANT

A perforated ground stone pendant (28.0/3563) was associated with Burial 1 (fig. 21a). This artifact was made of a gray, diabase-like stone (Martin Prinz, AMNH, Department of Mineral Sciences, personal commun.). Three flakes of identical material (28.0/3561a, 28.0/3561b, 28.0/3562), found nearby, had obviously crumbled off the distal end of the pendant. The flakes are ground on both faces and on one margin, suggesting that they once constituted the distal margin.

This pendant was probably flaked and then pecked into a rough elongated oval shape, 203.7 mm. long and 50.5–88.1 mm. wide. It

was finished by thoroughly grinding each surface, flattening the rock's crystals to a high sheen. The middle third of both faces is more highly polished than the two-thirds on either end. The finished artifact is quite thin (Th = 10.9 mm.) with a lenticular cross section and longitudinal view. The margins are ground and flat, except for the distal margin which has had several pieces detached. A biconical perforation (diameter ranging from 3.8 to 7.1 mm.) occurs 58.5 mm. from the proximal end. A reddish stain (probably ochre) about 40.0 mm. long appears on the left dorsal surface, adjacent and proximal to the perforation. A similar, but rather faint, stain appears on the right ventral margin, distal to the perforation.

Moore reports a grooved and incised pendant made of soapstone associated with Burial 44 at South End Mound I, and several other ground stone artifacts as well. A similar

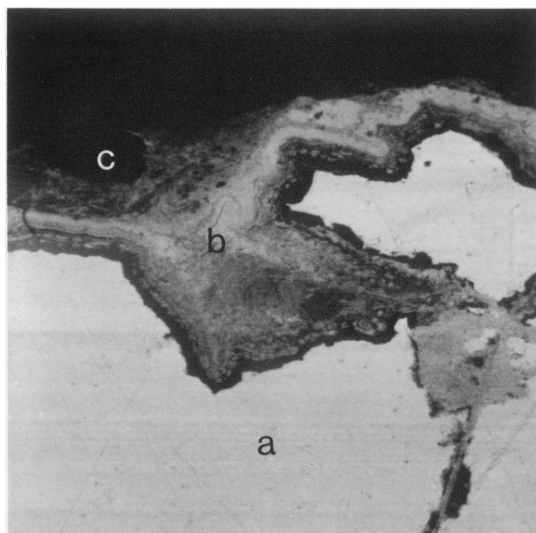


Fig. 20. Back scatter electron image (BEI) of the margin of a galena cube (28.0/3564) from South End Mound II showing the interior of the cube (a), cube margin (b), and silica inclusion (c). Approximately  $100\times$ .

artifact is illustrated by Moorehead (1917, p. 50) from a C. B. Moore excavation in Mississippi. Moorehead suggested that the objects are pendants, since they have one hole, differing from gorgets which have two holes.

#### PROJECTILE POINTS

Ten bifacially flaked artifacts were also recovered in excavations at South End Mound II (fig. 22). The five typable bifaces occurred in the Feature A concentration along with three untypable biface and projectile point fragments. A projectile point tip was found with the Feature B cremations, and a point blade—made of shell—occurred as an isolated find (see table 2).

The five typable projectile points fit the range of Pinellas points thought to originate during the late period, A.D. 1200–1600. Many Pinellas points are minimally modified triangular points (Bullen, 1975, pp. 6, 8).

Four of the typable points (28.0/5512, 28.0/5515–5517) correspond to Bullen's Type 2, narrow isosceles triangles; the other point (28.0/5508) is a Type 4, a somewhat wider equilateral triangle. All points have straight to incurvate margins and slightly concave bases (WB/WM = 1.0; BIR range 0.94–1.0,

$\bar{X} = 0.96$ ). Only one complete point (28.0/5512) and three fragments (28.0/3304, 28.0/5509a, 28.0/5513c) appear to have been pressure flaked. The remainder have irregular, minimally shaped outlines, suggesting that the manufacturing strategy was expedient, achieving a small triangular shape. Typically, one margin consists of an unretouched fracture. Although all specimens are pointed, the margins remain thick. The shell projectile point fragment (28.0/3304) appears to be from a corner-notched point which may have been broken in the notching process. The large gray chert biface fragment (28.0/5509a) seems to be part of a side-notched projectile point base, type unknown, which broke off when a flaw in the material was activated.

With the exceptions of 28.0/5508, 28.0/5509a, and 28.0/5512, the longitudinal sections are thick and uneven. The bifaces are thickest at the base, tapering somewhat near the tip. Cross sections are irregular and chunky with squarish, thick margins that rendered the bifaces virtually useless as projectile points or knives (Th/WM = 0.35–0.40). The exceptions mentioned above are delicately fashioned with thin lenticular cross sections (Th/WM = 0.21–0.23). The shell projectile point fragment (28.0/3304) has a fairly thick (Th/WM = 0.31) biconvex cross section.

The margins on these points are damaged with step fractures suggestive of manufacturing problems. Several margins also contain small scalar "nibbles" which can also accrue during manufacture (particularly in platform preparation). Moreover, most of the nibbling is interrupted by fresh flake scars, also suggestive of manufacturing damage. One point (28.0/5517) has minute unifacial rectilinear flakes overriding the thinning flakes on one margin, indicating that the point may have been used. The margins of 28.0/5512 are very lightly ground and smooth. Margins on several of the points are smoothed, a further indication of use. Generally, the use wear is too ephemeral and unpatterned to offer more than a mere suggestion of the former purpose of the tool. Fragment 28.0/3565a has been resharpened at least once with bilaterally crushed margins; it may once have been the base of a Pinellas point, but was subsequently resharpened for possible use as a drill. The shell projectile point blade fragment (28.0/

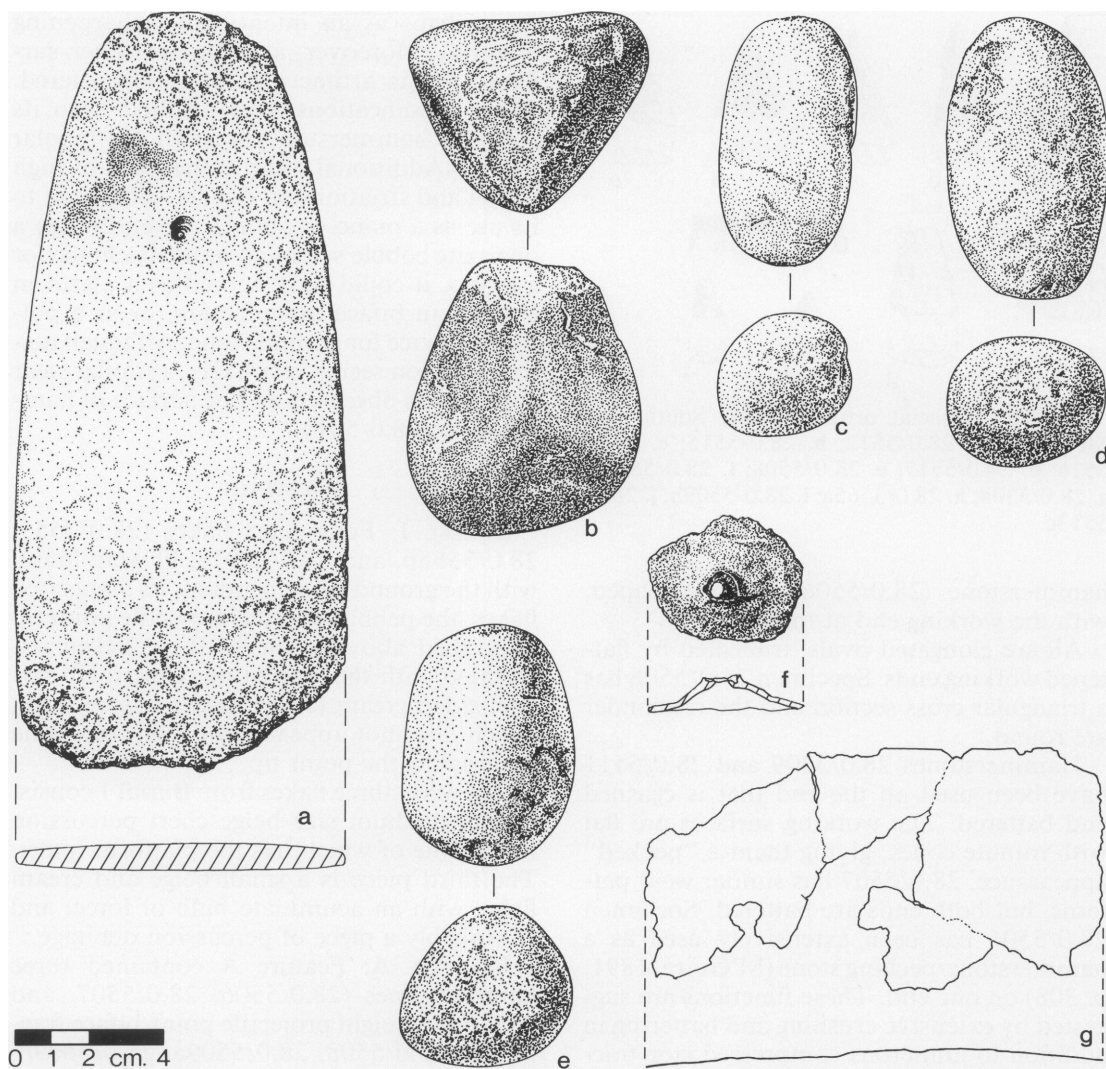


Fig. 21. Miscellaneous artifacts from South End Mound II. **a.** Diabase-like pendant (28.0/3563) found in association with Burial 1. Hammerstones: **b.** 28.0/5506; **c.** 28.0/5507; **d.** 28.0/5511; **e.** 28.0/3309. Copper artifacts: **f.** earspool (28.0/3566); **g.** copper sheet (28.0/3568, schematic).

3304) is too soft to have retained useful wear traces; however, the margins are smoothed and dulled.

The flake scar patterns on 28.0/5512 result from diagonal parallel pressure flaking; the other bifaces have unpatterned flaking. Flake scars are generally wide, short, roundish, and steep, ending in stepped terminations. Flake scars on 28.0/5512 and 28.0/5509a are thin, shallow, and parallel sided, ending in feathered terminations overlapping the midline.

#### HAMMERSTONES

The four quartzite hammerstones are illustrated in figure 21 and the metric attributes are presented in table 11. Three were found with the Feature A concentration; 28.0/3309 is an isolated find from mound fill.

Three hammerstones (28.0/3309, 28.0/5507, 28.0/5511) are small oblong quartzite cobbles with rounded ends. The stones are lozenge-shaped and fairly flat. The fourth

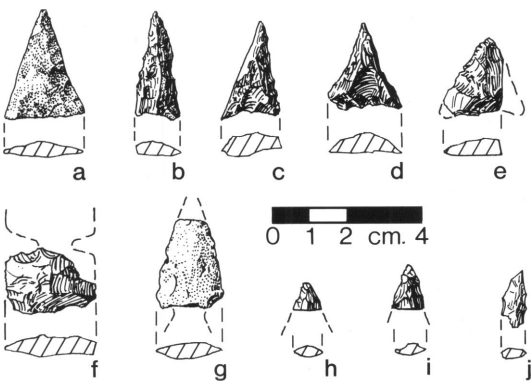


Fig. 22. Bifacial artifacts from South End Mound II. a. 28.0/5512; b. 28.0/5515; c. 28.0/5516; d. 28.0/5517; e. 28.0/5508; f. 28.0/5509a; g. 28.0/3304; h. 28.0/3565a; i. 28.0/5509h; j. 28.0/5513c.

hammerstone (28.0/5506) is cone-shaped, with the working end at the tip.

All are elongated ovals, truncated by flattened working ends. Specimen 28.0/5506 has a triangular cross section and the remainder are round.

Hammerstones 28.0/3309 and 28.0/5511 have been used on the end that is crushed and battered. The working surfaces are flat with minute cones, giving them a “pocked” appearance. 28.0/5507 has similar wear patterns, but both ends are battered. Specimen 28.0/5506 has been extensively used as a hammerstone/pecking stone (M’Guire, 1891, p. 308) on one end. These functions are suggested by extensive crushing and battering in addition to numerous compressed step fractures along one margin. Several flakes were detached from the hammerstone during use

(or perhaps as an intentional resharpening method). Moreover, at least two other surfaces of this artifact are flat and battered. These modifications have resulted from its use as a hammerstone or anvil for bipolar flaking. Additional wear in the form of high polish and striations on one flat face point to its use as a mano or abradar. Even though a quartzite cobble seems an unlikely choice for a mano, it could have served as a platform abradar in biface manufacture, or as a polishing device for ground stone. Although neither function seems very likely, a similar wear pattern was observed on one surface of hammerstone 28.0/5511.

DEBITAGE

BURIAL 1: Four chert flakes (28.0/3555, 28.0/3565b, and 28.0/6007a, b) were found with the ground stone pendant, its associated flakes, the pebble, and the projectile point tip (described above). One of these flakes, associated with the cremation, is a small parallel-sided cream chalcedony pressure flake, which does not appear to be from the same material as the point tip.

The other three flakes from Burial 1 consist of two medium size beige chert percussion flakes, one of which has the platform intact. The third piece is a small beige and cream flake, with an acuminate bulb of force, and is probably a piece of percussion debitage.

FEATURE A: Feature A contained three hammerstones (28.0/5506, 28.0/5507, and 28.0/5511), eight projectile point/biface fragments (28.0/5508, 28.0/5509a, 28.0/5509h, 28.0/5512, 28.0/5513c, 28.0/5515, 28.0/5516, and 28.0/5517), and 39 pieces of debitage.

TABLE 11  
Hammerstones from South End Mound II<sup>a</sup>

Specimen Number	Provenience	Length Max. (mm.)	Width Max. (mm.)	Thickness (mm.)	Length Worked Edge (mm.)	Width Worked Edge (mm.)	Edge Angle (deg.)	Spine Plane Angle (deg.)	Weight (g.)
28.0/3309	Test Pit V	65.8	46.5	44.5	28.3	32.0	95	80	192.9
28.0/5506	Feature A	78.8	61.5	51.7	50.0	35.6	110	70	309.1
28.0/5507	Feature A	67.0	35.6	33.8	a. 10.6 b. 10.5	a. 20.2 b. 17.8	105	70	123.3
28.0/5511	Feature A	76.3	43.5	36.0	14.5	18.0	95	50	178.2

<sup>a</sup> All hammerstones are quartzite.



age. The raw lithic materials from Feature A provided an opportunity to investigate the possibility of on-site lithic manufacturing.

All debitage appears to be percussion debris, and all but one piece (28.0/5513a) are interior flakes. To see whether the debitage was produced from the same material as the bifaces, the materials were divided into nine groups based on color and texture.

Raw material *Group 1* is the calcite point (28.0/5512). No debitage of this material was recovered.

*Group 2* is the tan chalcedony point (28.0/5508).

Two pieces of gold chalcedony debitage (28.0/5510a, b) form *Group 3*, similar but not identical to the biface in *Group 2*.

*Group 4* contains the three gold/brown chert points and one point fragment (28.0/5509h, 28.0/5515, and 28.0/5517). None of the debitage from Feature A is similar to this material.

*Group 5* is the gray chert biface fragment (28.0/5509a). No debitage of this material was recovered from this feature.

*Group 6* consists of a cream chalcedony pressure flaked biface fragment (28.0/5513c). Percussion debitage 28.0/5510c and 28.0/5513b appears to be of the same material as the biface.

*Group 7* is a cream chert percussion-flaked biface (28.0/5516). Nine pieces of percussion debitage appear to be from the same core (28.0/5509d, 28.0/5514a–h). 28.0/5514a is a biface thinning flake, with an unprepared, uncrushed platform, acuminate bulb with an eralieur scar, and an expanding feathered termination. 28.0/5514b is a shattered distal end. 28.0/5514c has a somewhat crushed, unprepared platform, a diffuse bulb, and indistinct compression rings leading to a stepped termination. 28.0/5514d is a utilized flake with tiny overlapping nibbles along one margin; it is the stepped end of a much larger flake. 28.0/5514e–g are overlapping biface thinning flakes with fairly diffuse bulbs and feathered terminations. 28.0/5514h is the stepped termination of a somewhat larger flake.

*Group 8* consists of 24 pieces of pink, gold, and tan mottled chert percussion debris (28.0/5518a–q, 28.0/5509b, c, e–g, i, and j). One or two of the pieces may be pressure flakes, but it is unlikely. All of the debitage are small

interior flakes; no artifacts were recovered which were made of this material.

*Group 9* is an orange chert, medium size cortex flake (28.0/5513a). No other artifacts made from this material were recovered.

We also note that two of the hammerstones from this feature (28.0/5507, 28.0/5511) could have been used to produce some of the bifaces or debitage from the feature. They are small hammerstones with use wear on both ends. The third hammerstone (28.0/5506), on the other hand, is too large to have produced the flakes and bifaces from this feature. The wear patterns on this hammerstone appear to have resulted from manufacturing large objects (such as ground stone) and sharpening similar objects. It was also probably used as a bipolar hammer/anvil, and a hand stone (abrader/mano).

To summarize, we find that although the hammerstones could have been used to produce four of the eight bifaces from this feature, the lack of complementary debitage with all but one (28.0/5516) of the bifaces suggests that biface manufacture was not the focus of activity that resulted in deposition of Feature A. This conclusion is further supported by the absence of finished or production stage artifacts manufactured from the same material as most of the debitage. The assemblage appears to be a purposeful cache of artifacts produced elsewhere, but the debitage could have been produced at the mound.

**FLAKE CONCENTRATION ON TOP OF UNIT IIIB:** This concentration, found lying on top of the midden lens, consists of 87 chert flakes, deriving from as many as 3 cores.

Two of the flakes are made from a rose colored chert, two others are a mottled white chert, and the rest are manufactured from a cream-gold chert. The flakes appear to be primarily percussion, but do not suggest biface thinning activity. Three pieces are core shatter. None are cortex flakes. Most are quite small, but 8 of the 11 medium size flakes are edge damaged. The damage, which may be use wear, generally consists of microscopic (7–20×) unifacial scalar scars. The damage could have accrued from scraping, but it is probably from platform preparation for further modification. This conclusion seems the most likely explanation for the wear patterns, which are fairly homogeneous around all the

TABLE 12  
Ceramic Frequencies at South End Mound II

Type	Premound	Stage I	Stage II	Totals
St. Catherines Fine Cord Marked	—	1	—	1
St. Catherines Plain	24	15	5	44
St. Catherines Burnished Plain	7	8	3	18
St. Catherines Incised	1	—	—	1
St. Catherines Burnished and Incised	1	1	6	8
Sand tempered, with burnt clay intrusions	—	3	—	3
Sand and clay tempered	1	1	1	3
Sand and clay tempered, incised	—	—	1	1
Clay and grit tempered, fine cord marked	—	—	1	1
Clay tempered	15	1	2	18
Clay tempered, incised	2	—	—	2
Unidentified	15	5	1	21
Totals	66	35	20	121

flake margins. Use wear is typically restricted to fewer margins, or sections of a margin on a flake.

The two mottled white flakes appear to be from the same material as the calcite projectile point (28.0/5512) from Feature A.

**ISOLATED DEBITAGE:** A total of 23 pieces of debitage was recovered from throughout the mound fill. A surprising amount of this isolated debitage is of the same materials as artifacts found in Feature A.

*Group 3* debitage (28.0/5510a, b) from Feature A is gold chalcedony, and eight isolated flakes are of the same material (28.0/3300–3303, 28.0/3308, 28.0/3310, 28.0/3527, 28.0/3531). Of these, 28.0/3527 is a shattered end. The remainder have unprepared platforms, slightly acuminate bulbs, and no more than two dorsal scars. The flakes are generally small and flat.

*Group 4* material from Feature A consists of three gold/brown chert projectile points and fragments. Five pieces of isolated debitage (28.0/3306a–c, 28.0/3307, 28.0/3529a) are of the same material. 28.0/3529a is a rectilinear chunk of shatter which is almost as wide as the two projectile points. It is not difficult to imagine it as a flake blank for a similar point. The points, which are very poorly made, were probably manufactured from a chunk of chert similar to this piece. The other four pieces are biface thinning flakes which were detached with excessive force; they are thick and irregular with shattered terminations.

*Group 5* material consists of a single gray chert biface fragment (28.0/5509a). One isolated flake (28.0/3530) is made of the same material. The flake is fairly large and thick, with several places where flakes have been removed. Like the biface, it was broken with a lateral snap, but the flake and biface do not refit.

*Group 7* material from Feature A consists of a cream chert biface (28.0/5516) and nine associated pieces of debitage (28.0/5509d, 28.0/5514a–h). Two of the isolated flakes (28.0/3298, 28.0/3299) appear to be from the same core. Both are medium size biface thinning flakes with unmodified platforms and moderately acuminate bulbs.

The remainder of the isolated material sorts into two groups, neither of which was present in the other features.

*Group 10* is composed of four flakes and one piece of core shatter made of a mottled gold and cream chert (28.0/3305, 28.0/3312, 28.0/3529b, c, 28.0/3553). All appear to be percussion debris. The largest flake (28.0/3312) has an unprepared platform, a prominent dorsal ridge, and a rounded distal termination with a small section of unifacial edge wear on the dorsal right distal margin.

*Group 11* consists of four dark/light mottled gold chert flakes. Two of the flakes (28.0/3528, 28.0/3529d) are either cortex flakes, or their dorsal surfaces contain tiny quartz crystals. The other two pieces (28.0/3529e, 28.0/3552) contain no quartz. One is a small percussion flake with a long thin stepped distal

TABLE 13  
Identified and Unidentified Specimens per Taxon from South End Mound II

Provenience	Taxon						Unident.	Totals
	<i>Odocoileus virginianus</i> (White-tailed deer)	<i>Lutra canadensis</i> (River otter)	<i>Sylvilagus</i> sp. (Rabbit)	<i>Mustela vison</i> (Mink)	Emydinae (Pond turtles)	Aves (Bird)		
Test Pit I	3	—	—	—	—	—	30	33
Test Pit III (Unit IIIb)	2 <sup>a</sup>	—	—	—	—	—	3	5
Test Pit IV	—	—	—	—	4	—	—	4
Test Pit V	1	—	—	—	—	—	—	1
Test Pit VII	16	—	—	—	—	—	51	67
Feature B	1	1	1	5	2	5	3	18
Feature A	—	—	—	—	—	—	8	8
Totals	23	1	1	5	6	5	95	136

<sup>a</sup> These fragments fit together.

termination; the other is a piece of distal shatter.

#### SHELL ARTIFACTS

Two utilized whelks were also recovered in the mound fill, one with a purposely cut dorsal end, and the other with a large rectangular segment removed from the caudal portion.

#### CERAMIC ARTIFACTS

Only 121 potsherds were encountered within South End Mound II (table 12). These sherds were found both in primary context, atop the premound surface of primary humus, and throughout the fill of construction Stages I and II.

These ceramics are diagnostic of the St. Catherines period in the coastal Georgia chronology (as defined by DePratter, 1979). This period is thought to commence about A.D. 1000 and last until about A.D. 1150 (as expressed in uncorrected radiocarbon years B.P.). As discussed earlier, this temporal assignment is consistent with the two radiocarbon determinations available for Stage I of mound construction.

#### NONHUMAN SKELETAL REMAINS Deborah Mayer O'Brien

The reptile and amphibian faunal remains encountered in the excavation of South End

Mound II were submitted for analysis to Dr. Charles Crumly, Department of Vertebrate Zoology, NMNH. All remaining nonhuman remains were identified in the Laboratory of Archaeology, AMNH.

The number of identified elements per taxon are presented in table 13. All identified taxa are present on St. Catherines Island today.

Roughly 100 bone fragments (listed in table 13 as either *Odocoileus virginianus* or "unidentified") are heavily weathered and stained a deep brown color. These fragments were all found within 30 cm. of the mound surface, and (on the basis of unfused long bones and unerupted molars) would seem to derive from a single, young, rather emaciated individual who died on site and whose bones were subsequently scattered within the upper 30 cm. of South End Mound II.

None of the bones in table 13 showed signs of butchering or burning.

#### DISCUSSION

Except for the two intersecting drainage ditches and the occasional pothole, South End Mound II was essentially undisturbed prior to examination by AMNH field crews. Despite its proximity to Irene period South End Mound I, this mound appears to have been constructed sometime during the St. Catherines or Savannah periods, not earlier than A.D. 1100, perhaps as late as A.D. 1300.

It is unfortunate that the human skeletal and dental sample recovered from these sites is meager and fragmentary. Although we did recover the remains of more than a dozen individuals from South End Mound II, the adverse conditions of deposition and preservation (complete disarticulation and a high water table) make it nearly impossible to provide an accurate biocultural profile of the human population represented—except to say that dental health was excellent. As discussed above and elsewhere (Thomas and Larsen, 1979; Larsen, 1980a, 1980b, 1981, 1982, 1983, 1984; Larsen and Thomas, 1982), good dental health is associated with, in general, preagricultural hunting and gathering populations (pre-A.D. 1150) on the Georgia coast. A wealth of data from other areas of the world supports this finding (cf. Cohen and Armelagos, 1984).

Similarly, although very little evidence for disease was noted in the South End Mound II series, the remains recovered from this site are simply too fragmentary to draw a reliable conclusion.

The radiocarbon evidence from South End Mound II is comparable with the two additional St. Catherines/Savannah period burial mounds located on this island. A single radiocarbon date,  $695 \pm 55$  B.P. [A.D. 1255] (UGA-1685), is available from Marys Mound (Larsen and Thomas, 1982, p. 280), and this determination is statistically indistinguishable from one of the radiocarbon determinations available from the oyster shell midden in South End Mound II:  $645 \pm 70$  B.P. [A.D. 1305] (UGA-3459).

The other date from the shell lens at South End Mound II— $865 \pm 75$  B.P. [A.D. 1085] (UGA-3458)—is statistically identical to both determinations from the Johns Mound (Larsen and Thomas, 1982, pp. 293, 297):  $897$  B.P.  $\pm 60$  [A.D. 1053] (UGA-61) and  $831$  B.P.  $\pm 60$  [A.D. 1119] (UGA-64). Such shell lenses could, of course, be secondary deposits of midden from elsewhere; if so, then the radiocarbon determination would refer to the age of midden deposition, not necessarily mound construction.

Mound architecture at these three sites is also remarkably similar (cf. Larsen and Thomas, 1982, pp. 278–280, 292–298). Construction on all three commenced with a cen-

tral pit feature, each containing multiple human burials. The central features at Johns and Marys mounds were log-lined pentagonal pits; that at South End Mound II was not sufficiently well preserved for us to observe mode of construction.

At all three sites, the central pit was then covered by a shell core, comprised largely of oyster shell midden. As noted above, these three shell features were equivalent in age. Construction ceased at all three sites with the addition of mound-shaped fill covering the central features.

The ceramic complexes of these three sites are also similar. The shell features at Johns and Marys mounds contained primarily sherds of St. Catherines and Savannah periods; the corresponding stratum at South End Mound II contained strictly St. Catherines period sherds.

Observation of dental pathology—in particular, dental caries—in Burial 1 might also suggest that South End Mound II was constructed during the St. Catherines period (i.e., prior to A.D. 1150). Previous studies by Turner (1979) based on worldwide populations have shown that hunter-gatherers have an average of 1.3 percent carious teeth, mixed (agriculture plus hunting, gathering, and fishing) populations an average of 4.4 percent carious teeth, and agricultural populations an average of 8.6 percent carious teeth. Studies based on Georgia coastal dental remains, in particular, have shown that the prehistoric preagricultural hunter-gatherer population (pre-A.D. 1150) had 1.3 percent carious teeth, while the prehistoric agricultural populations (A.D. 1150–1550) had 11.6 percent carious teeth (see discussions by Larsen, 1980a, 1980b, 1981, 1982, 1983, 1984). The frequency of carious teeth from South End Mound II is 0.6 percent, well below the percentage for both mixed and agricultural economies presented by Turner (1979) and the percentage presented for Georgia coastal agricultural populations by Larsen (summarized in Larsen, 1981, 1984).

Regardless of the specific age of construction, the radiocarbon, architectural, ceramic, and pathological evidence is similar for all three St. Catherines Island sites. But there are notable intrasite differences. Stage I at Johns Mound contained an extensive pre-

mound cemetery; postmound intrusive burials were present at both Johns and Marys mounds. South End Mound II lacked both associations.

But South End Mound II is distinctive particularly because of the presence of copper and galena artifacts inside the central pit. This association, not to our knowledge previously reported for coastal Georgia, is generally associated with Middle Woodland (ca. 300 B.C. to A.D. 400) manifestations throughout the eastern United States. More specifically, the so-called “Copena” burial mound complex is generally restricted to the Tennessee River drainage (Walthall et al., 1980, fig. 1). Although the cultural associations at South End Mound II do coincide with Copena assem-

blages, the temporal differences are marked and cannot be ignored.

To summarize, South End Mound II, a previously unexplored mortuary site is a St. Catherines/Savannah period burial mound, with a Central Pit containing two cremations and a mass grave containing at least 15 individuals. The grave goods—including a perforated copper sheet, worked galena, a sea otter mandible, and a polished stone pendant—have been rarely reported from archaeological contexts from this area. Construction methods resemble those employed at Johns and Marys mounds, two roughly contemporary mortuary sites on St. Catherines Island.

APPENDIX

TABLE 14  
Postcranial Dimensions (millimeters), South End Mound I

Individual	Variable	Measurement	
		Left	Right
A	Femur	—	
	Head diameter	—	40.4
	Neck, vertical diameter	—	27.4
	Neck, horizontal diameter	—	26.1
	Midshaft anterior-posterior	—	26.0
	Midshaft transverse	—	25.5
	Midshaft circumference	—	82
	Subtrochanteric anterior-posterior	—	24.6
	Subtrochanteric transverse	—	32.9
	Humerus		
	Maximum length	(280) <sup>a</sup>	—
	Midshaft maximum diameter	22.1	—
	Midshaft minimum diameter	15.7	—
	Midshaft circumference	63	—
	Head diameter	37.0	—
	Radius		
	Maximum length	(220)	—
	Head diameter	(21.0)	—
	Interosseous crest maximum	16.0	—
	Interosseous crest minimum	10.5	—
D	Ilium		
	Maximum length	28.8	—
	Femur		
	Maximum length	74.5	(73.0)
	Tibia		
	Maximum length	64.8	62.6

<sup>a</sup> ( ), measurement estimate. Stature estimate = 152.05 (±4.45) cm. (Stewart, 1979).

TABLE 15  
Summary of Postcranial Dimensions  
(millimeters), South End Mound II

Variable	Side	n	Mean
Femur			
Midshaft anterior-posterior	l	3	31.0 <sup>a</sup>
	r	—	—
Midshaft transverse	l	3	25.7 <sup>b</sup>
	r	—	—
Subtrochanteric anterior-posterior	l	1	26.5
	r	1	27.4
Subtrochanteric transverse	l	1	32.4
	r	1	32.9
Tibia			
Midshaft anterior-posterior	l	1	29.4
	r	1	41.4
Midshaft transverse	l	1	22.1
	r	1	24.5

<sup>a</sup> Range is 29.1–34.6.

<sup>b</sup> Range is 23.9–27.1.

TABLE 16  
Dental Dimensions (millimeters), South End  
Mound I

Indi- vidual	Tooth		Dimension		
A	mandibular	I2	(l)	length	—
				breadth	—
		C	(l)	length	—
				breadth	—
		P3	(l)	length	—
				breadth	—
		P4	(l)	length	7.2
				breadth	9.3
		M1	(l)	length	11.9
				breadth	11.6
		M2	(l)	length	12.5
				breadth	11.1
B	mandibular	dM1	(l)	length	8.7
				breadth	7.0
C	maxillary	I1	(l)	length	9.5
				breadth	—
		I2	(r)	length	7.8
				breadth	—
		M1	(l)	length	12.0
				breadth	12.5
		M1	(r)	length	11.9
				breadth	12.1
		d11	(l)	length	6.8
				breadth	4.9
		d12	(l)	length	5.4
				breadth	4.6
		dM1	(l)	length	7.8
				breadth	8.6
		dM1	(r)	length	7.6
				breadth	8.6
		dM2	(l)	length	9.8
				breadth	10.3
		dM2	(r)	length	9.8
				breadth	10.5



TABLE 17  
Summary Statistics of Dental Dimensions  
(millimeters), South End Mound II

Tooth	Dimen- sion	Side	n	Mean	Range	S.D.
Mandible						
I1	length	l	0	—	—	—
		r	0	—	—	—
	breadth	l	1	5.5	—	—
		r	0	—	—	—
I2	length	l	2	6.2	5.6–6.7	0.78
		r	1	5.8	—	—
	breadth	l	2	6.1	5.8–6.3	0.36
		r	1	5.9	—	—
C	length	l	2	7.8	7.7–7.9	0.14
		r	7	7.6	7.2–8.7	0.55
	breadth	l	1	8.4	—	—
		r	6	7.9	7.7–8.4	0.26
P3	length	l	5	7.4	7.2–7.9	0.28
		r	7	7.5	7.0–8.0	0.38
	breadth	l	5	8.1	7.4–8.7	0.49
		r	7	8.6	8.0–10.3	0.78
P4	length	l	4	7.6	7.3–8.0	0.29
		r	5	7.7	7.2–8.6	0.56
	breadth	l	4	8.6	8.5–8.7	0.12
		r	5	8.7	7.7–9.8	0.80
M1	length	l	7	12.2	11.1–13.3	0.75
		r	7	12.2	11.4–13.2	0.57
	breadth	l	7	11.5	10.7–12.5	0.63
		r	7	11.6	11.1–12.3	0.48
M2	length	l	8	11.9	10.4–12.8	0.78
		r	7	11.7	10.2–13.1	1.08
	breadth	l	8	11.0	10.5–12.0	0.23
		r	7	11.2	10.6–12.3	0.64
M3	length	l	5	10.9	9.6–11.8	0.89
		r	6	11.0	9.6–11.5	0.69
	breadth	l	5	10.8	10.1–12.0	0.74
		r	6	10.6	9.5–12.1	0.89
dI1	length	l	0	—	—	—
		r	0	—	—	—
	breadth	l	0	—	—	—
		r	0	—	—	—
dI2	length	l	0	—	—	—
		r	1	4.7	—	—
	breadth	l	0	—	—	—
		r	1	3.9	—	—
dC	length	l	0	—	—	—
		r	0	—	—	—
	breadth	l	0	—	—	—
		r	0	—	—	—
dM1	length	l	1	9.3	—	—
		r	0	—	—	—
	breadth	l	1	7.0	—	—
		r	0	—	—	—

TABLE 17—(Continued)

Tooth	Dimen- sion	Side	<i>n</i>	Mean	Range	S.D.
dM2	length	l	0	—	—	—
		r	0	—	—	—
	breadth	l	0	—	—	—
		r	0	—	—	—
Maxilla						
I1	length	l	2	8.4	8.0–8.8	0.57
		r	2	8.7	8.4–9.0	0.42
	breadth	l	3	7.3	7.2–7.4	0.12
		r	2	7.4	7.2–7.5	0.22
I2	length	l	3	6.3	5.9–6.6	0.36
		r	3	6.8	6.5–7.0	0.27
	breadth	l	3	5.4	4.9–6.2	0.73
		r	3	6.1	5.7–6.6	0.46
C	length	l	2	8.2	8.1–8.2	0.10
		r	1	8.0	—	—
	breadth	l	2	8.2	8.0–8.4	0.28
		r	1	8.0	—	—
P3	length	l	5	7.7	7.4–8.2	0.47
		r	3	7.9	7.5–8.1	0.32
	breadth	l	4	9.7	9.0–10.4	0.66
		r	2	9.6	8.7–10.4	1.20
P4	length	l	4	7.2	6.7–8.3	0.66
		r	2	7.2	6.9–7.4	0.36
	breadth	l	3	9.9	9.1–10.6	0.77
		r	1	8.6	—	—
M1	length	l	6	11.0	9.3–11.8	0.96
		r	4	11.3	10.5–12.1	0.67
	breadth	l	6	12.3	11.4–13.0	0.69
		r	4	12.3	11.4–13.3	0.99
M2	length	l	4	10.4	9.6–11.3	0.70
		r	5	10.4	9.8–11.3	0.60
	breadth	l	4	11.8	11.0–12.3	0.58
		r	5	12.0	11.4–12.5	0.55
M3	length	l	5	9.3	8.6–10.7	0.83
		r	2	9.2	8.8–9.5	0.50
	breadth	l	5	10.9	9.9–12.8	1.96
		r	2	10.3	9.5–11.0	1.06
dI1	length	l	0	—	—	—
		r	0	—	—	—
	breadth	l	0	—	—	—
		r	0	—	—	—
dI2	length	l	0	—	—	—
		r	0	—	—	—
	breadth	l	0	—	—	—
		r	0	—	—	—
dC	length	l	0	—	—	—
		r	2	6.6	6.2–6.9	0.50
	breadth	l	0	—	—	—
		r	2	5.8	5.5–6.0	0.36

TABLE 17—(Continued)

Tooth	Dimen- sion	Side	n	Mean	Range	S.D.
dM1	length	l	0	—	—	—
		r	1	7.8	—	—
	breadth	l	0	—	—	—
		r	1	8.8	—	—

TABLE 17—(Continued)

Tooth	Dimen- sion	Side	n	Mean	Range	S.D.
dM2	length	l	0	—	—	—
		r	0	—	—	—
	breadth	l	0	—	—	—
		r	0	—	—	—

## LITERATURE CITED

- Bhaskar, S. N. (ed.)  
1980. *Orban's oral histology and embryology*, 9th ed. St. Louis, C. V. Mosby.
- Blakey, Michael L., and George J. Armelagos  
1985. Deciduous enamel defects in prehistoric Americans from Dickson Mounds: prenatal and postnatal stress. *Amer. Jour. Phys. Anthrop.*, vol. 66, no. 4, pp. 371–380.
- Bullen, Ripley P.  
1975. *A guide to the identification of Florida projectile points*. Gainesville, Kendall Books.
- Caldwell, Joseph R.  
n.d. Unpublished field notes, St. Catherines Island.
- Caldwell, Joseph R., and Catherine McCann  
1941. Irene Mound Site, Chatham County, Georgia. Athens, University of Georgia Press.
- Caldwell, Joseph R., and Antonio J. Waring, Jr.  
1968. Some Chatham County pottery types and their sequence. In Stephen Williams (ed.), *The Waring Papers*. Papers Peabody Mus. Archaeol. Ethnol., vol. 58, pp. 110–133.
- Cohen, Mark Nathan, and George J. Armelagos (eds.)  
1984. *Paleopathology at the origins of agriculture*. New York, Academic Press.
- DePratter, Chester B.  
1975. The Archaic in Georgia. *Early Georgia*, vol. 3, no. 1, pp. 1–16.  
1979. Ceramics. In David Hurst Thomas and Clark Spencer Larsen, *The anthropology of St. Catherines Island: 2. The Refuge-Deptford mortuary complex*. *Anthrop. Papers Amer. Mus. Nat. Hist.*, vol. 56, pt. 1, pp. 109–123.
- Fraikor, Arlene L., James J. Hester, and Frederick J. Fraikor  
1971. Metallurgical analysis of a Hopewell copper earspool. *Amer. Antiquity*, vol. 36, no. 3, pp. 358–361.
- Franklin, U. M., E. Badone, R. Gotthardt, and B. Yorga  
1981. An examination of prehistoric copper technology and copper sources in western Arctic and Subarctic North America. *Natl. Mus. Man Mercury Series, Archaeol. Surv. Canada*, paper no. 101.
- Friedman, Arnold M., Edward Olsen, and Junius B. Bird  
1972. Moche copper analyses: early New World metal technology. *Amer. Antiquity*, vol. 37, no. 2, pp. 254–258.
- Garrison, Ervan G., James G. Baker, and David Hurst Thomas  
1985. Magnetic prospection and the discovery of Mission Santa Catalina de Guale, Georgia. *Jour. Field Archaeol.*, vol. 12, pp. 299–313.
- Goad, Sharon I.  
1978. Exchange networks of the prehistoric southeastern United States. Ph.D. diss., Dept. of Anthrop., Univ. Georgia, Athens.  
1980. Chemical analysis of native copper artifacts from the southeastern United States. *Current Anthrop.*, vol. 21, no. 2, pp. 270–271.
- Goodman, Alan H., George J. Armelagos, and Jerome C. Rose  
1980. Enamel hypoplasias as indicators of stress in three prehistoric populations from Illinois. *Human Biol.*, vol. 52, no. 3, pp. 512–528.
- Houghton, Philip  
1974. The relationship of the pre-auricular groove of the ilium to pregnancy. *Amer. Jour. Phys. Anthrop.*, vol. 41, pp. 381–389.
- Hurst, Vernon J., and Lewis H. Larson, Jr.  
1958. On the source of copper at the Etowah site, Georgia. *Amer. Antiquity*, vol. 24, no. 2, pp. 177–181.
- Hutchinson, Dale L., and Clark Spencer Larsen  
1985. Biological stress and early European

- contact on St. Catherines Island, Georgia. Paper presented, American Anthropological Association, Washington, D.C.
- Jefferies, Richard W.  
1976. The Tunacunnhee site: evidence of Hopewell interaction in northwest Georgia. *Anthrop. Papers Univ. Georgia*, no. 1, pp. 1-72.
- Larsen, Clark Spencer  
1980a. Dental caries: experimental and biocultural evidence. *Tennessee Anthrop. Assoc. Misc. Paper No. 5*, pp. 75-80.  
1980b. Human skeletal and dental health changes on the prehistoric Georgia coast. In James D. Howard, Chester B. DePratter, and Robert W. Frey (eds.), *Excursions in southeastern geology: the archaeology-geology of the Georgia coast*. Atlanta, Geological Society of America, pp. 192-201.  
1981. Skeletal and dental adaptations to the shift to agriculture on the Georgia coast. *Current Anthrop.*, vol. 22, no. 4, pp. 422-423.  
1982. The anthropology of St. Catherines Island: 3. Prehistoric human biological adaptation. *Anthrop. Papers Amer. Mus. Nat. Hist.*, vol. 57, pt. 3, pp. 159-270.  
1983. Behavioural implications of temporal change in cariogenesis. *Jour. Archaeol. Science*, vol. 10, pp. 1-8.  
1984. Health and disease in prehistoric Georgia: the transition to agriculture. In Mark Nathan Cohen and George J. Armelagos (eds.), *Paleopathology and the origins of agriculture*. New York, Academic Press, pp. 367-392.
- Larsen, Clark Spencer, and David Hurst Thomas  
1982. The anthropology of St. Catherines Island: 4. The St. Catherines Period mortuary complex. *Anthrop. Papers Amer. Mus. Nat. Hist.*, vol. 57, pt. 4, pp. 271-342.
- Larson, Lewis H., Jr.  
1958. Southern Cult manifestations on the Georgia Coast. *Amer. Antiquity*, vol. 23, no. 4, pp. 426-430.
- M'Guire, J. D.  
1891. The stone hammer and its various uses. *Amer. Anthrop.*, vol. 4, no. 4, pp. 301-312.
- Moore, Clarence Bloomfield  
1894. As to copper from the mounds of the St. John's River, Florida. *Jour. Acad. Nat. Sci. Philadelphia*, vol. 10, pp. 213-241.  
1897. Certain aboriginal mounds of the Georgia coast. *Jour. Acad. Nat. Sci. Philadelphia*, vol. 11, pp. 4-138.
- Moorehead, Warren K.  
1917. Stone ornaments used by Indians in the United States and Canada. Andover, Mass., The Andover Press.
- Olsen, Edward J.  
1962. Copper artifact analysis with the x-ray spectrometer. *Amer. Antiquity*, vol. 28, pp. 234-238.
- Ortner, Donald J., and Walter G. J. Putschar  
1984. Identification of pathological conditions in human skeletal remains. Washington, D.C., Smithsonian Institution Press.
- Pendleton, Lorann S. A.  
1985. Material culture: artifacts of stone. In David Hurst Thomas, *The archaeology of Hidden Cave, Nevada*. *Anthrop. Papers Amer. Mus. Nat. Hist.*, vol. 61, pp. 183-218.
- Ralph, E. K., H. N. Michael, and M. C. Han  
1973. Radiocarbon dates and reality. *MASCA Newsletter*, vol. 9, no. 1, pp. 1-20.
- Schneider, Kent A.  
MS. Results of copper analysis, Tunacunnhee site, Dade County, Georgia. *Geochronology Laboratory, University of Georgia, Athens* [1974].
- Shapiro, Gary  
1984. Ceramic vessels, site permanence, and group size: A Mississippian example. *Amer. Antiquity*, vol. 49, no. 4, pp. 696-712.
- Shipman, Pat, Giroud Foster, and Margaret Schoeninger  
1984. Burnt bones and teeth: an experimental study of color, morphology, crystal structure and shrinkage. *Jour. Arch. Science*, vol. 11, pp. 307-325.
- Stewart, T. Dale  
1979. *Essentials of forensic anthropology: especially as developed in the United States*. Springfield, Mass., Charles C Thomas.
- Swärdstedt, T.  
1966. *Odontological aspects of a medieval population in the province of Jamtland/Mid-Sweden*. Stockholm, Tiden-Barnanken.
- Thomas, David Hurst  
1981. How to classify the projectile points of Monitor Valley, Nevada. *Jour. California Great Basin Anthrop.*, vol. 3, no. 1, pp. 7-43.
- Thomas, David Hurst, Grant D. Jones, Roger S. Durham, and Clark Spencer Larsen  
1978. *The anthropology of St. Catherines Is-*

- land: 1. Natural and cultural history. *Anthrop. Papers Amer. Mus. Nat. Hist.*, vol. 55, pt. 2, pp. 155-248.
- Thomas, David Hurst, and Clark Spencer Larsen  
 1979. The anthropology of St. Catherines Island: 2. The Refuge-Deptford mortuary Complex. *Anthrop. Papers Amer. Mus. Nat. Hist.*, vol. 56, pt. 1, pp. 1-180.
- Thomas, David Hurst, Stanley South, and Clark Spencer Larsen  
 1977. Rich man, poor men: observations on three antebellum burials from the Georgia Coast. *Anthrop. Papers Amer. Mus. Nat. Hist.*, vol. 54, pt. 3, pp. 393-420.
- Turner, Christy G., II  
 1979. Dental anthropological indications of agriculture among the Jomon people of central Japan. *Amer. Jour. Phys. Anthrop.*, vol. 51, pp. 619-636.
- Ubelaker, Douglas H.  
 1974. Reconstruction of demographic profiles from ossuary skeletal samples: a case study from the tidewater Potomac. *Smithsonian Contrib. Anthropol.*, no. 18.  
 1984. Human skeletal remains: excavation, analysis, treatment, 2nd ed. Washington, D.C., Taraxacum.
- Van Vark, Gerrit Nanning  
 1970. Some statistical procedures for the investigation of prehistoric human skeletal remains. Groningen, Rijksuniversiteit of Groningen.
- Walthall, John A.  
 1981. Galena and aboriginal trade in eastern North America. *Ill. State Mus. Sci. Papers*, no. 17.
- Walthall, John A., Stephen H. Stow, and Marvin J. Karson  
 1979. Ohio Hopewell trade: galena procurement and exchange. In D. S. Brose and N. M. B. Greber (eds.), *Hopewell archaeology*. Kent, Ohio, Kent State Univ. Press, pp. 247-250.  
 1980. Copena galena: source identification and analysis. *Amer. Antiquity*, vol. 45, no. 1, pp. 21-42.
- MS. Source identification of prehistoric galena artifacts, eastern North America. On file, Dept. Anthropol., Amer. Mus. Nat. Hist. [1982].









