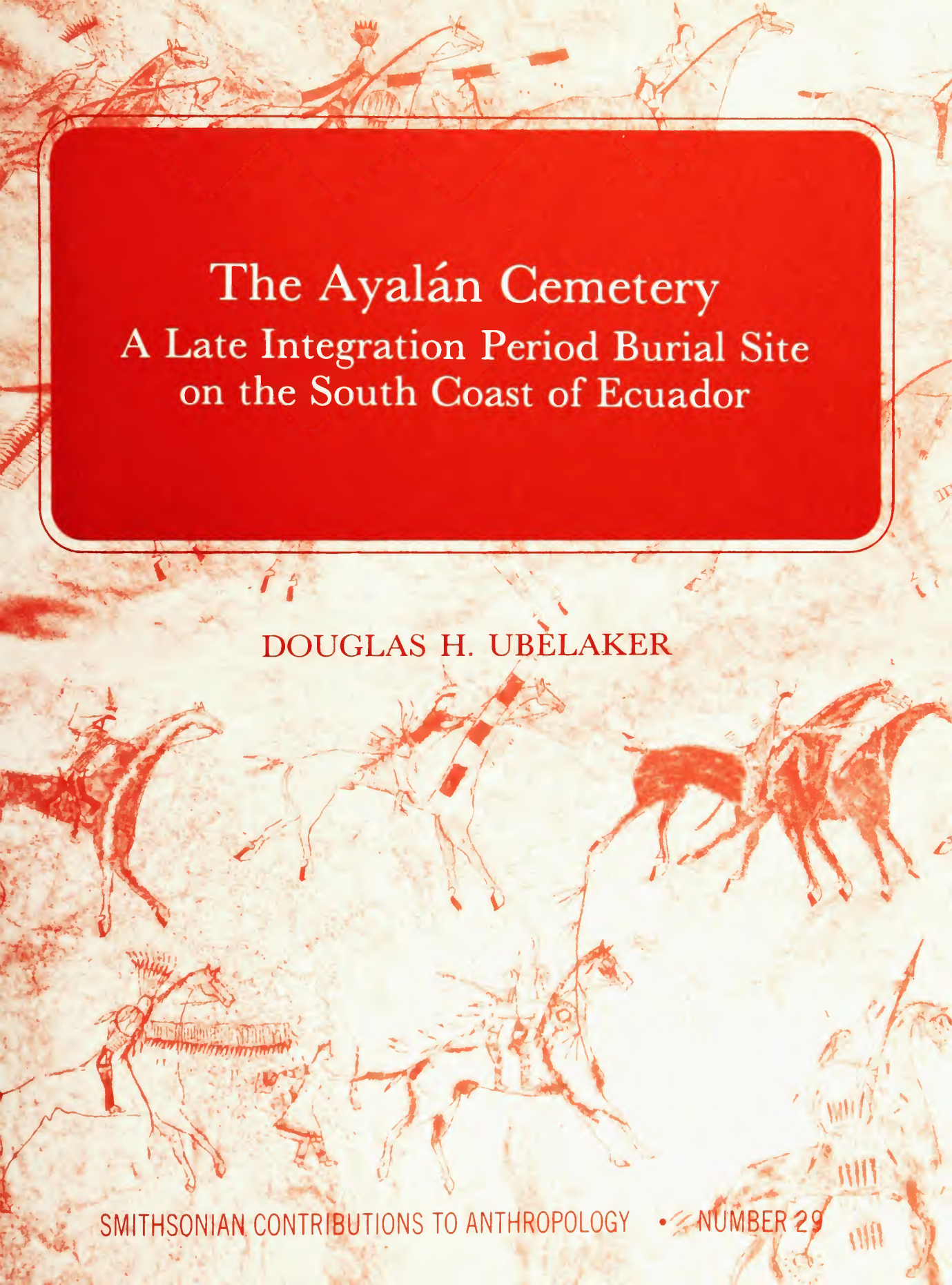
The Ayalán Cemetery

A Late Integration Period Burial Site on the South Coast of Ecuador

DOUGLAS H. UBELAKER



SMITHSONIAN CONTRIBUTIONS TO ANTHROPOLOGY • NUMBER 29

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ABSTRACT

Ubelaker, Douglas H. The Ayalán Cemetery: A Late Integration Period Burial Site on the South Coast of Ecuador. *Smithsonian Contributions to Anthropology*, number 29, 175 pages, 119 figures, 170 tables, 1981.—Excavation of a Milagro Phase Integration Period cemetery in 1972 and 1973 on the southern coast of Ecuador yielded 54 large funerary urns (AD 730–AD 1730) and 25 primary and two secondary burials (500 BC–AD 1155) located outside of the urns. Radiocarbon dates were obtained from charcoal and bone collagen and their validity is discussed. The urn burials with inverted urn coverings are similar to those reported from other Milagro Phase cemetery sites in Guayas and Los Ríos Provinces. The urns at the Ayalán cemetery contained secondary skeletal remains of as many as 25 persons per urn (average of about nine persons per urn) along with artifacts, such as ceramic jars, plates and compoteras, beads of shell, stone, and pottery, ear and nose rings of copper, silver, and gold, triangular copper plates (axe money), and small spheres of lead with copper inserts. Similar artifacts were found associated with the burials outside of the urns.

Detailed data are presented on archeological features, artifacts, and such biological subjects as demography, pathology, cranial measurements, nonmetric observations, and cultural practices registered in bone. Cultural differences between the urn features and the earlier non-urn features are minimal. Biological data shared by urn and non-urn samples include cranial deformation, reconstructed living stature, and porotic hyperostosis. The urn sample shows greater life expectancy at birth, lower infant mortality, greater adult life expectancy (especially in females), higher frequencies of foot bone alterations (probably indicating kneeling posture), vertebral osteophytosis, arthritic lipping at the knee, dental caries, alveolar abscesses, dental hypoplasia, and evidence of infectious disease. On the other hand, the urn sample shows fewer lines of increased density, fewer healed fractures, a lower frequency of joint degeneration (although more severe examples), and less dental calculus. An appendix by Brian Hesse, "The Association of Animal Bones with Burial Features," examines the faunal remains associated with the burial features.

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Introduction

In January 1973, Earl H. Lubensky, then Consul General of the United States in Guayaquil and an enthusiastic archeologist on the side, took the opportunity while on home leave in Washington, D.C., to tell us at the Smithsonian about his discovery and preliminary excavation during 1972 of an urn burial site on the coast of Ecuador. Lubensky's description of the urn burials and the apparent excellent preservation of the human remains intrigued me. Recognizing the need for more detailed information on prehistoric mortuary customs in Ecuador and seeing the opportunity to assemble an important, large, well-preserved, and well-documented skeletal sample, I accepted his gracious invitation to join the excavation and to analyze the burial remains. With support from the Smithsonian Research Foundation, I travelled to Ecuador on 25 June 1973. After resolving initial problems of obtaining equipment and personnel, I assumed supervision of the excavation on 5 July and continued intensely through 25 August. Following the field season, all human and faunal remains and some of the small artifacts were sent to the Smithsonian for detailed study. The other artifacts remained in Ecuador at Universidad Católica de Guayaquil, which had agreed to accept them as a basis for establishing an archeological museum and new curriculum.

ACKNOWLEDGMENTS.—Contributors to this research and publication are numerous. Primary acknowledgement goes to Earl Lubensky, who initiated this project and continued to contribute throughout its duration. He was instrumental in organizing all phases of the excavation and specimen processing and generously provided access to field notes, photographs etc. Most of the artifacts were cleaned and restored by Lubensky or technicians under his supervision.

At the Smithsonian, Clifford Evans, Betty J. Meggers, T. D. Stewart (all of the Department of Anthropology), and others contributed stimulating ideas on analysis and data interpretation. Evans and Meggers also made available their original field notes and those of Emilio Estrada. Brian Hesse (now at University of Alabama at Birmingham) volunteered his time in analyzing the faunal remains and in preparing Appendix I. The identification of the avian and rodent specimens was made possible through the aid and cooperation of Storrs L. Olson, Department of Vertebrate Zoology, and Alfred L. Gardner, Fish and Wildlife Service, U.S. Department of the Interior. Shell remains, especially shell beads, were identified by Joseph Rosewater, Depart-

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ment of Invertebrate Zoology, and Thomas R. Waller, Department of Paleobiology. Several of the femoral thin sections used in age estimation were prepared by David Yong of the Department of Anthropology. The remaining sections were prepared by research assistant Stephanie M. Damadio, who also assisted in tabulating much of the data, preparing tables, proofreading and conducting numerous other aspects of the analysis. Elizabeth C. Beard, Jean E. Fitzgerald, Eleanor K. Haley, Katharine J. Holland, and Sandra Jenkins typed drafts of the manuscript. All original art work was skillfully prepared by George Robert Lewis, Anthropology Department scientific illustrator, and photographs were produced by photographer Victor E. Krantz, and the Office of Photographic Services. Radiocarbon dates were generated by the Smithsonian Radiation Biology Laboratory, under the supervision of anthropologist Robert Stuckenrath. I especially thank Joan B. Horn, Albert L. Ruffin Jr., and Barbara Spann of the Smithsonian Press for their positive editorial contributions to this manuscript.

Two staff members of the FBI Laboratories in Washington made contributions that added much appreciated new data: Victor R. Matricardi provided spectroscopic analysis of the metal artifacts and Frederick Wallace analyzed the yarn adhering to the copper plates.

Many persons in Ecuador, assisted with this study. Special thanks go to José Jorgge Arévalo, owner of Hacienda Ayalán for his cooperation during the summer of 1973. He not only allowed us to conduct the excavation on his land, but contributed a vehicle and our lodging on the hacienda. Pedro Porras Garcés of Quito was instrumental in the early organization of the project, especially in providing students to assist in the excavation. Two of his students, Richard Madden and Maruja Andrade Heymann (later to become Maruja Andrade de Ubelaker) provided excellent assistance in the excavation. Maruja also assisted in all phases of specimen processing and analysis, especially data collecting on the artifacts that remained in Ecuador. Filoteo Samaniego and Rodrigo Pallares Z. in Quito and Julio Estrada Ycaza in Guayaquil cooperated in granting permits for excavation and exporting materials for analysis. Archeologists in Guayaquil, Olaf Holm, Carlos Zevallos M., Resva Parducci Z., Presley Norton, and Miguel Wagner all provided assistance and stimulating discussion on Ecuadorian archeology. Universidad Católica de Guayaquil, especially former rector José Baquerizo Maldonado, cooperated in providing space for processing and storing cultural materials. William Burgos cleaned and reconstructed many of the cultural specimens under Lubensky's supervision, prior to their transfer to Universidad Católica.

Finally, I express gratification to the residents of Ayalán for working with us and sharing their facilities for nearly two months. Regular participants in the excavation were Agapo Bohorquez, Gustavo Bohorquez, Adolfo Cerino, Julian Cerino, Justo Mite, Armando Montalban, and Rafael Montalban; many others were in some way involved. The opportunity to become acquainted with the people of Ayalán and to experience their way of life made that summer especially meaningful.

Urn Burial Sites in Ecuador

One of the most complex and unusual methods of disposal of the dead in prehistoric Ecuador was secondary interment in ceramic urns, usually concentrated within mounds. This custom has been reported from late prehistoric periods in several geographic areas within Ecuador, but it is best known from the coast, particularly in the Manteño and Milagro Phases of the Late Integration Period. Urn burial represents a multistage procedure probably involving the following sequential steps: (1) initial mourning following death; (2) placement of the body in a temporary storage area; (3) removal of bones and transfer to a permanent cemetery; and (4) final deposit in the ground within ceramic urns. The procedure was in some cases shortened by placing recently deceased individuals directly in the urns. Also, the procedure was extended occasionally to include cremation or the construction of artificial mounds

over the urns. Urn burials may be accompanied by primary interments and they may occur singly with inverted urn coverings or in more elaborate multiple arrangements, with several urns stacked to form a single vertical column.

In spite of the unusual nature of the practice of urn burial and the larger number of such sites excavated on the coast, remarkably little is known about details of the practice or about the skeletons contained within. Published accounts of these excavations are mostly confined to descriptions of the locations of the sites and only six provide maps showing approximate locations of urns and other archeological features. A survey of the published sources and unpublished notes of Emilio Estrada, Clifford Evans, and Betty J. Meggers reveals a total of 31 coastal sites that definitely contain urn burials. Of these, two are from the Province of Esmeraldas, one from Manabí, 22 from Guayas, and six from Los Ríos. Those that have been dated are from the Late Integration Period, with some overlapping into the Colonial Period. This is considerably later than the earliest appearance of urn burials farther north in Colombia where, according to Reichel-Dolmatoff (1965:136), urn burials concentrated in large cemeteries occurred as early as AD 1000.

Of the 31 coastal Ecuadorian sites with urns, six (19 percent) contained single urns, usually with inverted urn coverings, and 15 (48 percent) contained multiple urns, consisting of several jars stacked on top of each other to form a vertical column. The literature refers to the latter as "multiple," "stacked," or "chimney-type" urns. Three sites (10 percent) contained both single and multiple urns. Information on the type of urn arrangement is not available for the remaining seven (23 percent) sites.

In 22 of the sites (71 percent), the urns were located in mounds or on natural hilltops. Most of the mounds are reported as natural formations except in the Milagro area where Evans and Meggers (pers. comm.) feel that all burial mounds were constructed artificially.

Only one site (Puerto del Morro) is reported to contain urns definitely without a mound. Information on the presence or absence of a mound is not available for the remaining eight sites (26 percent). Three sites (10 percent) in the Milagro area are reported to contain primary skeletons, buried outside the urns.

All of the urns are assumed to be for burial purposes, although skeletal remains are mentioned at only 10 sites (32 percent). Primary skeletons were described at two sites. Skeletons at the remaining eight sites were listed as secondary or simply "bones." In at least three sites, the skeletal remains had decomposed to only fragments of bone and teeth.

The following is a summary of these individual urn burial sites as they are numbered on the map in Figure 1.

1. Puerto de Chanduy; Province: Guayas. Estrada (1957a:20) describes funerary urns buried in natural formations, with no other information.
2. Pedro Carbo; Province: Guayas. Estrada (1957a:17, 33) lists multiple urns and mounds from this site. Green glass beads of apparent European origin date the site to within the European contact period.
3. Cerro de Chaco; Province: Guayas. Estrada (1957a:20) describes urns with conical "nipple-shaped" bases and inverted urn coverings. The urns were found in natural hills. Estrada's unpublished notes indicate that one large jar measuring 74 cm in diameter and 108 cm in height contained one human tooth.
4. Pimochá; Province: Los Ríos. Estrada's (1957a:33) chart lists both multiple urns and mounds from this site.
5. La Compañía; Province: Los Ríos. This site was extensively damaged by caterpillar tractors preparing the land for increased sugar cane production. At the invitation of the owner, Betty J. Meggers, Clifford Evans, and Emilio Estrada examined the site while two mounds were being leveled. Their unpublished notes list a total of seven mounds and document that the two mounds being destroyed contained burial urns. Mound "A" was totally destroyed when they arrived ex-

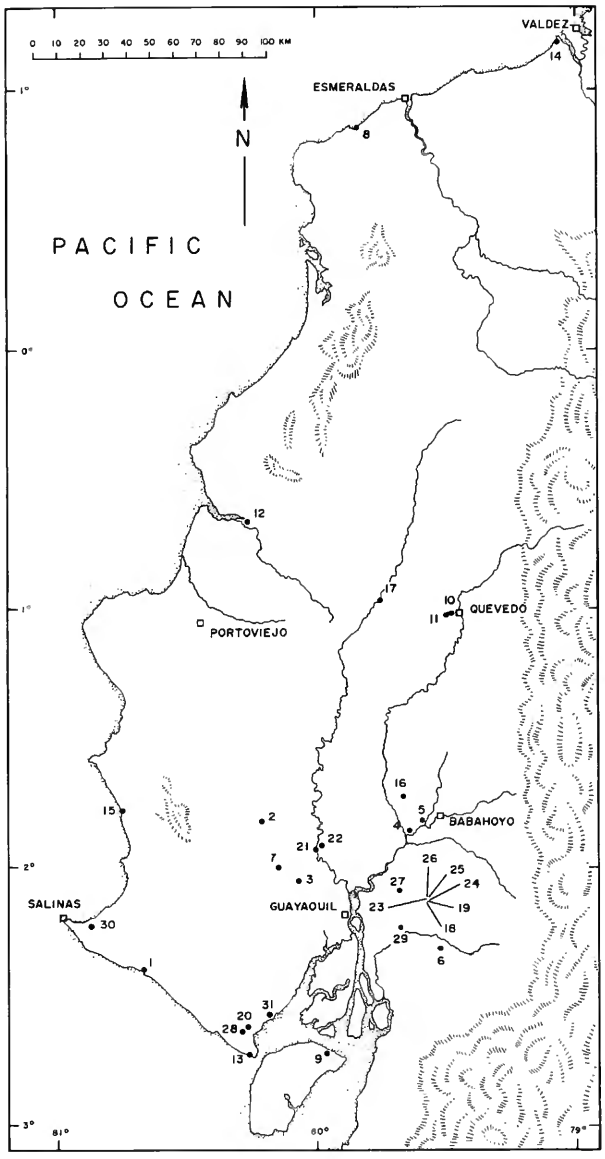

FIGURE 1.—Location of urn burial sites in Ecuador; location numbers identified in text.

cept for the very center which showed evidence of six urns clustered around a large central urn. The large central urn consisted of one upright urn, covered with an inverted urn, which was in turn covered with another inverted urn. The entire complex measured about 2.4 m from top to bottom. There were indications that numerous other urns had been in the mound, but were destroyed prior to their arrival.

Mound "B" measured 50 × 21 m. A 10 × 10 m excavation produced 62 urn burials in no obvious pattern. Both single urns with inverted urn coverings and multiple "chimney" burials with many urns stacked vertically occurred. In the multiple urns, the bottoms of urns within the column had been removed so that the interior space was continuous. Meggers and Evans (pers. comm.) believe that the mounds were artificially constructed around the urns.

Most of the skeletal remains had completely decomposed. One urn (field catalogue number 1244) with an unusual quantity of artifacts did contain the fragmentary remains of at least two individuals: an adolescent (10 to 15 years of age) and an adult (35+ years). Five of the adult teeth displayed circular drilled perforations, apparently for holding inlays (Ubelaker, 1977).

Small quantities of human bone and teeth were recovered from additional features from this site. The following is my detailed analysis of remains from each feature. The field numbers 1250 through 1297 refer to individual features, which range from single urns to several urns stacked on top of each other. Letter subdivisions a, b, etc., refer to specific locations within single features.

1250. Long bone shaft fragments and one adult maxillary right first molar, showing slight wear. Age at death 8–16 years. Within this feature of nine vertically stacked urns, the skeletal remains were found in the eighth urn from the top.

1251a. Most of a fragmentary cranial vault, one adult maxillary premolar showing slight wear and one deciduous maxillary second molar showing no wear. The adult is probably age 20–30; the subadult is between 1.5 and 3 years.

1252b. Five crowns: three adult mandibular molars with initial dentin exposure; one adult mandibular molar and premolar with no wear. All teeth could represent a single young adult.

1252c. Twenty-seven adult teeth, all showing slight wear: maxillary, two central incisors, one right lateral incisor, two premolars, and 11 molars; mandibular, three premolars and eight molars. At least two young adults are represented.

1256b. Three adult teeth: two mandibular molars showing no wear and one maxillary first molar showing slight wear. At least one young adult is represented.

1257. One adult maxillary third molar. Slight wear suggests an age at death of 20–30 years.

1258a. Two deciduous mandibular second molars showing no wear; age at death two to three years.

1258b. Eighteen adult teeth: maxillary left central and lateral incisors, two premolars, and four molars; mandibular left canine, two premolars, and seven molars. The mandibular teeth and one maxillary premolar show no occlusal wear. All other teeth show slight wear. At least two individuals are represented, both young adults.

1258c. Several eroded cranial fragments, and two deciduous teeth showing no wear: one maxillary second molar and one mandibular right canine. The teeth suggest an age at death of about two years.

1259b. Two adult teeth: one first maxillary molar with no wear and one mandibular molar with slight wear. An age at death of between seven and 10 years is suggested.

1260b. Several long bone fragments and nine adult teeth: maxillary left central and lateral incisors, left canine, and two third molars; mandibular left canine, two premolars, and one first molar. The mandibular first molar shows slight wear; all other teeth show no wear. The remains represent a young adult, probably between 20 and 25 years.

1264. Only one tooth, an adult maxillary right first or second molar showing slight wear. The individual was between eight and 18 years at death.

1265. Four adult maxillary molars: one first molar with no wear, two third molars with slight wear and one additional molar with slight wear. The remains probably represent a young adult.

1269. One maxillary left first molar with no wear. An age at death of six to 10 years is suggested.

1275. Six adult teeth: four maxillary molars, one first with no wear and three with slight wear; one maxillary premolar with initial dentin exposure; and one mandibular premolar with no wear. If the teeth represent only one individual, an age at death of about 15 years is suggested.

1276. Adult male innominates, two thoracic and one lumbar vertebrae with no osteophytes, and four adult teeth: one premolar, one mandibular molar, one maxillary first molar with initial dentin exposure, and one maxillary third molar with slight wear. One right pubis with a nearly complete ventral rampart suggests an age at death of 30–35 years.

1277. Seven adult teeth: maxillary right lateral incisor, premolar, and first molar; mandibular premolar and three molars. All teeth show slight wear and suggest an age at death of 20–30 years.

1278. Two adult teeth: a maxillary molar with slight wear and a mandibular premolar with no wear. The attrition

data suggest an age at death of 12–15 years.

1280. One thoracic vertebra fragment showing no osteophytic development and ten teeth: deciduous, maxillary first molar with slight wear and a mandibular second molar with no wear; adult, maxillary, two premolars with slight wear, one canine with slight wear, one first molar with no wear; adult, mandibular four first or second molars with slight wear. At least two individuals are represented, one of 14–18 years and one of four to seven years.

1282. No teeth, but a left and right female ilium, left humerus, cranial fragments, and a left mandible with several teeth missing antemortem. The missing teeth suggest an age at death of probably more than 30 years.

1284. Two adult mandibular teeth: one left canine and one incisor, showing no wear. An age at death of 10–15 years is suggested.

1289. Four adult molar teeth with slight wear: three mandibular and one maxillary. If only one individual is represented, an age at death of 13–20 years is probable.

1290. One adult mandibular left condyle, one adult maxillary third molar with no wear, and one deciduous mandibular second molar with slight wear. At least two individuals are present: one child, age seven to eight years and one adult, age 18–25 years.

1292. Seven adult teeth: two maxillary premolars, one maxillary molar, and four mandibular molars. All show slight wear and suggest an age at death of 15–20 years.

1294. Two adult mandibular molars with slight wear representing an individual between nine and 30 years at death.

1297. Fifteen adult teeth with slight wear: maxillary, one left lateral incisor, two premolars, four first or second molars, two third molars; mandibular, three first or second molars, and three third molars. An age at death of 23–30 years is suggested.

The above data show that both sexes and all ages were present in the urns, and some urns contained multiple individuals. A minimum of 33 individuals were recovered from 24 features, an average of 1.38 persons per feature. Due to the extreme decomposition of the bones, the actual numbers could be much higher. The following individual counts were recorded for six age categories: three between 0 and 5 years; four between 5 and 10 years; six between 10 and 15 years; four between 15 and 20 years; 14 between 20 and 30 years; and two greater than 30 years. Most of these ages were estimated from the extent of dental attrition and thus are not highly accurate. Nevertheless, the data show unusually high numbers of young adults and low numbers of individuals below 5 years and greater than 30 years. This could reflect nothing more than excessive decomposition within the youngest and oldest age categories.

6. Boliche; Province: Guayas. Estrada (1954:32) references this site excavated by Carlos Zevallos M. as containing primary skeletons resting on ceramic chairs within urns. No additional information is presented.

7. Cerro de Paco; Province: Guayas. Estrada (1957b:34) describes urns containing skulls and bone fragments (some burned) from this site. Estrada's unpublished field notes refer to the site as a hilltop containing a series of shaft burials; however, Estrada's (1957a:33) chart shows neither mounds nor multiple urns associated with this site.

8. Atacames; Province: Esmeraldas. Saville (1913:381, 383) notes briefly that prior to his first visit to Atacames in 1907, a skeleton was

found in a "burial tube" on the right bank of the Atacames, just above the town of Atacames.

9. Puna Nueva, Puna Island; Province: Guayas. Estrada (1957a:20) notes funerary urns buried within natural formations.

10. Quevedo I; Province: Los Ríos. Estrada's (1957a:33) chart shows multiple urns and mounds for this site. His unpublished notes describe chimney-type urn burials with primary skeletons located outside the urns.

11. Quevedo II; Province: Los Ríos. Estrada's (1957a:33) chart lists multiple urns and mounds for this site also. His notes describe chimney burials similar to those in Quevedo I.

12. Veliz; Province: Manabí. Estrada's (1962: 133) diagram of "corte L" shows an urn with a ceramic covering, and he describes the interment (1962:24) as "secondary," relating to the upper strata of the site.

13. Punta Arena de Posorja; Province: Guayas. Estrada's unpublished notes mention funerary urns within this hilltop site. No additional information is available.

14. La Tolita; Province: Esmeraldas. Estrada's (1957a:33) chart lists both multiple urns and mounds.

15. Olon; Province: Guayas. Estrada (1957b:34) notes that five funerary urns were found in a single 2 × 3 m excavation. One of these contained at least three skulls (Estrada, 1957b:33).

16. Las Palmas; Province: Los Ríos. Estrada's (1957a:33) chart lists both mounds and multiple urns for this site, although more detailed discussion by Estrada (1954:65) does not mention burial urns. Similarly, his diagram (1954:73) does not show urns. Estrada's unpublished notes list 10 large jars but do not mention bones.

17. Pajarito; Province: Los Ríos. Unpublished field notes of Meggers and Evans note that prior to their visit at this site, several large urns had been removed from a small mound 8 m in diameter. Local inhabitants provided descriptions of the multiple chimney-type urn burial.

18. Timalo; Province: Guayas. Estrada's (1957a: 33) chart lists multiple urns and mounds. No additional information is available.

19. Jácome; Province: Guayas. According to Estrada's (1957a:33) chart this site contains multiple urns and mounds. Estrada's unpublished notes add that the mound producing the urns measured 15 × 9 m with a height of 7 m and was excavated in 1955.

20. Puerto del Morro; Province: Guayas. Estrada (1957a:33) lists multiple urns but no mound for this site.

21. Loma de los Naranjos; Province: Guayas. Field notes of Meggers and Evans list burial urns with inverted coverings, with only a few teeth and bone fragments surviving decomposition.

22. Barranco de las Lechuzas; Province: Guayas. According to Meggers and Evans' field notes, a local inhibitant described a "four meter burial tube" which washed out the year before. Their interpretation is a multiple chimney-type burial.

23. Gante; Province: Guayas. The most thorough description of this site is provided by Estrada (1954:17–29). He illustrates 16 urn burials arranged in symmetrical, evenly spaced rows of four. Eight of the urns are single with inverted urn coverings. The remaining eight urns are multiple, chimney-type, with the bottoms removed from the middle urns. His diagram shows the upper horizontal row containing only single urns, the row below, only multiple urns; the next row only single urns; and the bottom row only multiple urns. Four extended primary skeletons and six isolated skulls are interspersed among the urns. The

primary skeletons are consistently on their backs with the skulls northwest of the postcranial skeletons. Information on the occurrence of a mound is not available.

24. Tola de Piñuelal, La "Loma de Oro"; Province: Guayas. Estrada's (1954:79) diagram provides the most detailed information on this site. The diagram shows five urns and two primary skeletons in the lower levels of a mound. The urns are all single with flat bottoms and covered with an inverted pointed-bottom urn. The urns with coverings measure about 1.5 m from top to bottom. The diagram suggests that each urn contained a single primary skeleton sitting upright. Skeletons within and outside the urns all are oriented the same direction (specific direction not given) and all are flexed about 70° at the hip and 90° at the knee. The mound itself appears to be about 12 m in diameter at its base and about three m in height from ground level.

25. La Elisita; Province: Guayas. Estrada (1957a: 22–23) reports 36 burial urns from a single mound at this site. One diagram shows that of the 36 urns, 18 are single with inverted urn coverings, one (the largest) is single without a covering and the remaining 17 urn burials are multiple. The multiple urn deposits each contain from three to six urns. The mound itself is about six m high and 23 m in diameter. The urns occur at varied levels within the mound and are arranged irregularly around the large single urn located in the center at ground level.

26. Papayal; Province: Guayas. Estrada's (1957a:22) diagram shows three mounds containing funerary urns. The largest (A) consists of a rectangle with rounded corners measuring about 60 × 133 m. Twenty-eight urns are shown in the center of the mound arranged in a rectangular formation that measures 26 × 34 m. An earlier publication of the same map (Estrada, 1954:43) shows 27 urns to be present. Mound B on both maps is circular, about 18 m in diameter and contains 10 small urns arranged around a centrally located larger urn. Mound C is rectangular and measures about 16 × 26 m. It contains eight urns arranged in two parallel rows.

27. Loma de Patino; Province: Guayas. Meggers and Evans' field notes relate that this mound was destroyed by road construction. Local inhabitants indicate the height of the mound was reduced about 2 m by the construction activity. Meggers and Evans observed two urns exposed on the surface. They were about 46 cm in diameter and 1.3 m apart.

28. Loma de los Muertos; Province: Guayas. Meggers and Evans' notes describe a small natural mound where previous commercial excavation for gypsum uncovered burial urns. Reportedly, human bones were observed but discarded.

29. Tierra Santa; province: Guayas. Meggers and Evans' notes list many mounds on this site, one of which contained about 11 chimney-type urn burials, each containing four or five urns.

30. La Libertad; Province: Guayas. Bushnell (1951:99–100) describes burial urns associated with a Manteño site at La Libertad. One urn with inverted urn covering was found extending from a surface depth of about one foot down to about three feet. The lower urn contained the incomplete secondary remains of at least one adult and five subadults. Some of the bones may have been calcined.

    Bushnell mentions a similar urn burial found nearby, containing at least two adults and three subadults.

31. Ayalán; Province: Guayas. Estrada's notes relate that excavation in 1956 revealed small mounds containing "nipple" bottom urns. No other information is available on these excavations.

    Hacienda Ayalán actually contains a number of shell mounds and at least three urn ceme-

teries. The shell mounds have been partially exploited commercially for calcium and fertilizer and have been tested archeologically by several professionals (Lubensky, 1974). Until recently the cemetery sites have received little attention, except for rare intrusions by untrained artifact seekers. In 1972, amateur archeologist Earl Lubensky, then U.S. Consul General in Guayaguil, visited the cemetery on "Punta Anllulla," correctly recognized it as an urn cemetery, and initiated an excavation that identified the major components (urn burials and primary skeletons outside the urns). In December 1972 Mr. Lubensky was in Washington, D.C., on home leave and related his discoveries. With prompt financial support from the Smithsonian Research Foundation, I traveled to Ecuador in July 1973 and supervised completion of the excavation by September. This excavation revealed 54 funerary urns, 25 primary skeletons, and one concentration of secondary bone outside of urns. Most of these features were excavated and removed for more detailed analysis. The results of the effort are presented in the remainder of this report.

Cemetery at Ayalán

The cemetery at Punta Anllulla, Hacienda Ayalán (Figure 2), is located approximately 24 km NE of the current town of Playas and about 27.5 km SE of the present town of Gómez Rendón (El Progreso), in Guayas Province. The cemetery rests on a slight elevation within a ceibo (kapok) forest (Figure 3) with dense underbrush. The immediate area is called "Potreros Los Ceibos" on local maps. Surrounding vegetation is visually dominated by the picturesque ceibo trees that occur throughout Guayas Province. The ceibo forests are surrounded by a savanna-type environment consisting mainly of grasses, giant cacti, and low shrubs. The savanna is separated from the estuary by dense mangrove swamps, occasionally interrupted by the barren salt-sand deposits known as "salitres." During the dry season, the cemetery site is about 1.5 km from the nearest surface water supply, and only about 0.6 km from the nearest mangrove concentration.

Excavation Approach

When Lubensky initiated excavation of this site in 1971 he referred to it as "Anllulla alpha" to distinguish it from other sites on Hacienda Ayalán. He concentrated on an area measuring 8 × 10 m, which he referred to as the "main cut" (Figure 4). This initial cut was aligned with magnetic north and was further subdivided into 2 m squares. The five rows running west to east were designated by letters A through E. Rows running from south to north were given sequential numbers from 0 to 3. Thus the 2 m square in the southwestern corner was designated A-0, while the square in the northeastern corner was E-3.

Within this framework, each 2 m square was excavated by artificial 10 cm levels except at surface level. Contents of each level were sifted through a fine screen and all artifacts from each square and level were packaged separately for later analysis. Funerary urns, primary skeletons, and concentrations of pottery and/or human bones encountered in this process were given feature numbers and were left in situ until they were nearly completely exposed. By the time the author arrived in July 1973, excavation had proceeded to depths ranging from 50 cm in A-3 to 110 cm in squares B-0 and D-0 (Table 1). At that time, 44 features had been identified and 13 of these had been removed.

To maintain continuity within the excavation, I continued the approach initiated earlier. The excavation proceeded, utilizing 10 cm levels in removing soil and cultural materials from around the burial features. Once completely isolated, the features were excavated by me or workers directly under my supervision. Using this system we completed excavation within the original 8 × 10 m area, and expanded the excavation in all directions. To define the cemetery limits and obtain samples from other areas, additional excavations were conducted at (A) 1 m square about 6 m SE of the SE corner of square E-0; (B) 1 m square 50

cm N of A; (C) 3 m × 50 cm trench located 23 m S of the SE corner of square E-0; (D) 4 m × 4 m square located 42.6 m N of the NE corner of the eastern extension of the original excavation; (E) 4 × 4 m square located 2 m E of cut D; (F) 1 m square located 8 m N of cut D (Figure 4). Artificial 10 cm levels were used only in the original 8 × 10 m excavation and in the one meter squares (A, B, F). Although all excavations contained cultural debris, only the original excavation and cut E produced human burials. Locations of all burial features within these excavations are shown in Figures 5 and 6. Eighty-one features were identified: 54 funerary urns, 25 primary skeletons, one secondary burial of human bone, and one concentration of pottery with a small amount of secondary bone.

Stratigraphy

At least three separate layers could be distin-

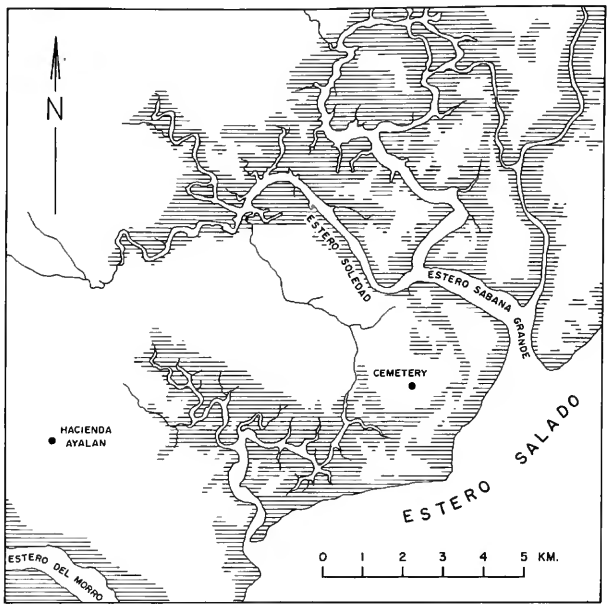

FIGURE 2.—Location of cemetery at Punta Anllulla, Hacienda Ayalán, coastal Ecuador.

FIGURE 3.—Location of cemetery at Punta Anllulla, Hacienda Ayalán, coastal Ecuador; note exposed urns in excavated main cut.

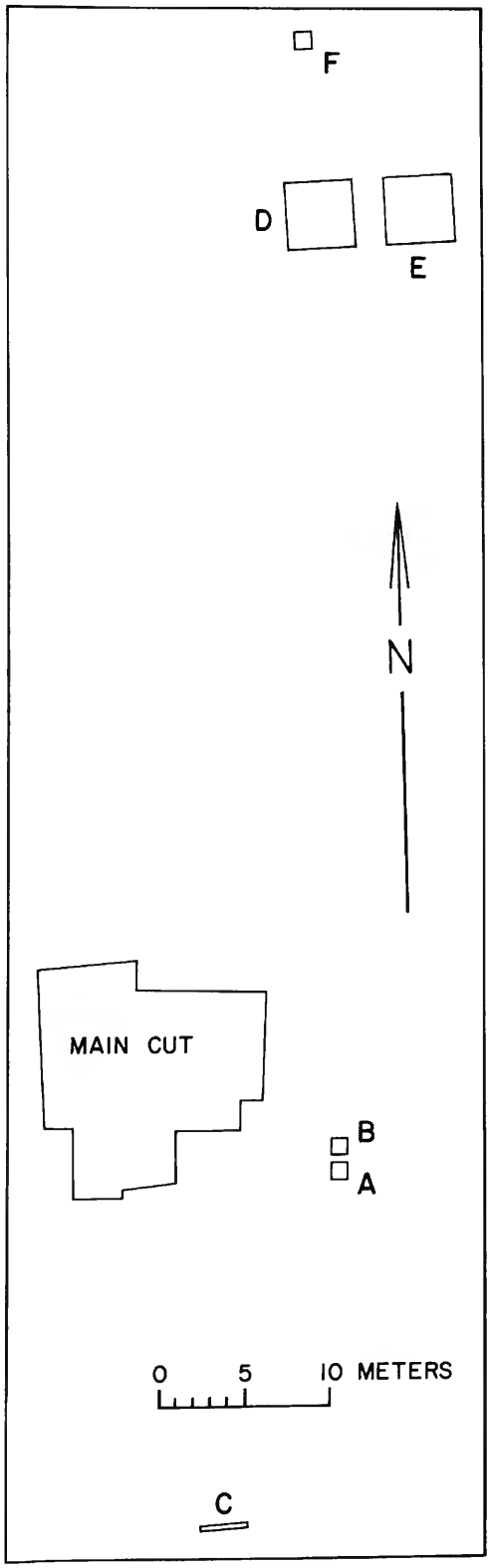

TABLE 1.—Depth (cm) of excavation in each square of main cut as of 5 July 1973 (see Figure 5)

Square	*Depth*	*Square*	*Depth*
A-0	100	C-2	80
A-1	70	C-3	60
A-2	70	D-0	110
A-3	50	D-1	80
B-0	110	D-2	80
B-1	80	D-3	60
B-2	80	E-0	100
B-3	60	E-1	80
C-0	100	E-2	80
C-1	90	E-3	60

guished in all areas of the site: an upper layer of light powdery soil; a middle layer of shell; and a lower layer of clay. The upper and middle layers contained considerable quantities of ceramic and shell refuse, while the clay layer usually lacked such materials.

The upper powdery soil extended from the surface to depths ranging from 40 cm in cuts E and F to 70 cm in square D-0 of the main cut. Particles of charcoal and soil coloration indicating fire exposure occurred irregularly throughout this layer, particularly in the main cut. In much of the excavation, the upper 10 to 30 cm of the topsoil was dark in color and rich in humus. The remainder of this layer was lighter in color and contained ash deposits.

The middle layer began at depths ranging from 40 to 70 cm and extended down to depths ranging from 60 to 100 cm. This layer extended throughout all excavated areas except cuts A and B, where it was confined to a small pocket 70 cm wide and 15 cm deep. In all areas it consisted of closely packed shells mixed with sherds and dark soil. In some areas of the excavation, the dark soil appeared to separate the shells from the light powdery soil above.

Although shells were concentrated within the middle layer, they occurred with considerable

FIGURE 4.—Excavated areas at Punta Anllulla, Hacienda Ayalán, coastal Ecuador.

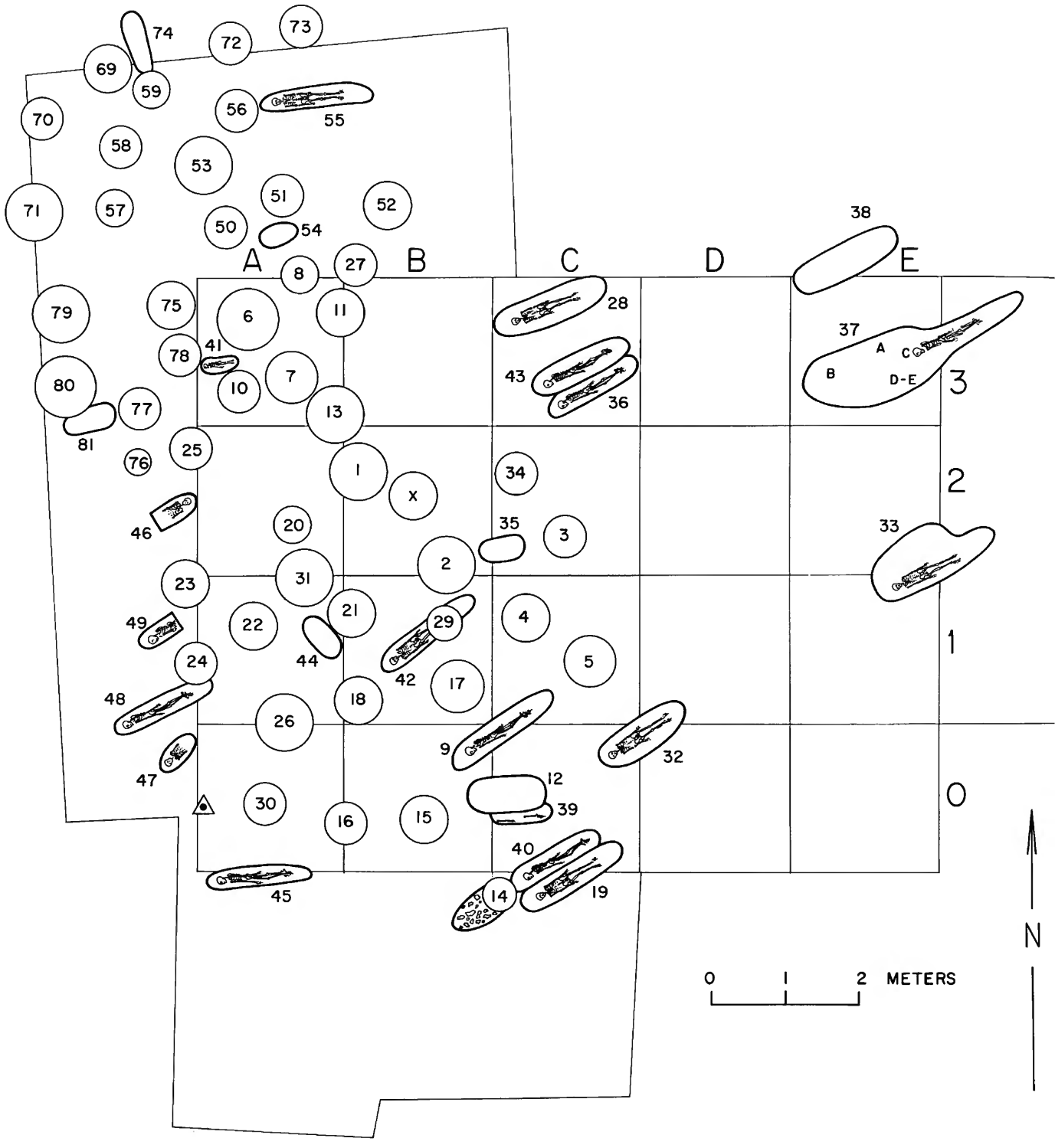

FIGURE 5.—Locations of burial features within main cut (x = disturbed area; △ = datum point).

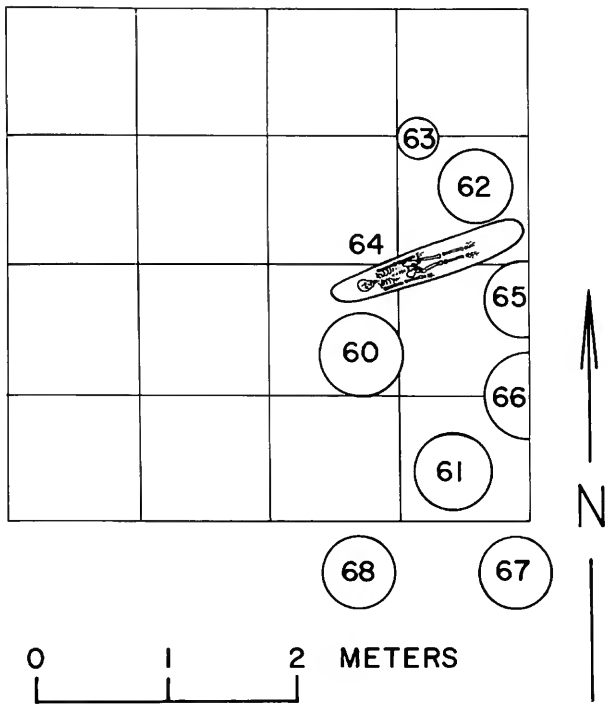

FIGURE 6.—Locations of burial features at cut E.

frequency within all of the strata above the clay. Table 2 lists the quantity of each species of mollusk found within the three 1 m squares A, B, and F. Most of the shells are either oyster (*Ostrea* sp., 70 percent) or clams (*Chione subrugosa*, 12 percent; *Protothaca asperrima*, 7 percent). Although 24 additional species are present, each accounts for 3 percent or less of the total accumulation. All of these species live in brackish water/estuary-type habitats and thus would have been readily accessible.

Tables 3, 4 and 5 show the weight distribution of each mollusk species within the 10 cm levels of the three test cuts. The largest accumulation occurred between 80 and 90 cm in cut A, 20 and 30 cm in cut B; and 50 and 60 cm in cut F. The data show little difference in species representation between upper and lower strata.

The lowest layer of hard, dark clay was sterile except for small quantities of shell and sherds that were present where this layer blended with the shell layer immediately above it.

RADIOCARBON DATES

Eleven radiocarbon dates were produced from this site. The first sample (SI-1372) was found in 1972 by Lubensky in square D-0 of the main cut at a depth between 1.0 and 1.1 m in association with what Lubensky felt were Chorrera-like ceramics. The sample was not associated with any feature and thus is difficult to interpret since materials outside of the features may have been mixed when the pits for the features were prepared. The sample was dated at 1300±95 years ago (AD 650).

Radiocarbon dates SI-3305 and SI-3306 were produced from wood charcoal samples found inside the urns of features 26 and 29 respectively. Both samples gave modern dates indicating that the features had been contaminated with recent material.

Three dates were produced from wood charcoal samples associated with primary skeletons. The sample labeled SI-3307 was found in soil associated with feature 37 and yielded an estimated age of 2450±120 years (500 BC). Sample SI-3308 was found within a ceramic jar associated with feature 49 and yielded an estimated age of 795±90 years (AD 1155). Sample SI-3309 was found in the soil associated with feature 49 and produced an estimated age of 840±60 years (AD 1110).

Five dates were produced from collagen extracted from the human bone. Three of these were from urn features and two from primary skeletons. Dates from the urn features are as follows: SI-3529, feature 25, 1220±115 (AD 730); SI-3530, feature 30, 220±60 (AD 1730); SI-3531, feature 77, modern. The two collagen dates from primary skeletons are SI-3532, feature 36, 1150±70 (AD 800) and SI 3534, feature 49, 965±70 (AD 985). Note that the collagen date for feature 49 (AD 985) is slightly earlier than the two carbon dates from that feature (AD 1155 and AD 1110).

The five dates associated with primary skeletons range from 500 BC to AD 1155, and average AD 710. Three of the urn samples gave modern dates and were apparently contaminated with

recent organic material. The remaining two urn dates are AD 730 and AD 1730, which average AD 1230. European manufactured beads within one urn feature indicate that the urns were still being deposited in the cemetery during historic times. Historical records, however, indicate it is highly unlikely the cemetery was still in use by AD 1730. A terminal date of about AD 1600 is much more probable.

Individual Feature Descriptions

The following descriptions of individual features comprise a survey of the excavation findings. More detailed information on human remains and associated artifacts is presented in later chapters and in Appendix II, which consists of Tables A1–A102, showing bone-type frequencies in the features.

Terminology used in describing artifacts is modified from that suggested by Meggers and Evans (1969). Categories of lip form are rounded, beveled interiorly, beveled exteriorly, flat, and tapered. Rim forms are direct, everted, angular, exteriorly thickened, and interiorly thickened. Neck forms of jars and urns express the degree of curvature (straight, convex, or concave) and the relation of the neck to the central vertical axis of the vessel (parallel, everted, or inverted) (Figure 7). The same rim terminology is applied to the plates and compoteras. The term "compotera plate" refers to those plates which show evidence that a compotera pedestal base was present once but has broken off. The bead classification is presented in Table 21 and associated text. Where a knife is present in photographs, its point indicates north.

Methods for estimating age and sex are those summarized by Ubelaker (1978). Whenever possible, adult age at death was estimated from the extent of internal cortical remodeling. Ground thin sections taken from the femoral midshaft were prepared using the procedures outlined by Ubelaker (1978). Ages were estimated using the Kerley method (Kerley, 1965) of counting secondary osteons, osteon fragments, primary osteons, and the amount of circumferential lamellar bone remaining in four circular fields 1.62 mm in diameter, distributed around the periosteal margin of the bone cortex. All counts were recorded using a Leitz Ortholux microscope fitted with a × 10 objective and × 10 wide-field eyepiece to produce a measured field size of 1.45 mm. All counts were adjusted for a field size of 1.62 mm as suggested by Kerley and Ubelaker (1978), and converted to an estimate of age using the Kerley (1965) profile chart.

Table 2.—Quantity of mollusk remains recovered from cuts A, B, and F (see Figure 4)

Species	*Weight (g)*	*% of total*
1. *Ostrea* species	75,313	70
2. *Chione (Iliochione) subrugosa*	12,426	12
3. *Protothaca asperrima*	7,013	7
4. *Thais kiosquiformis*	3,148	3
5. *Anadara grandis*	2,315	2
6. *Anadara similis*	2,264	2
7. *Triumphis distorta*	1,795	2
8. *Polinices panamaensis*	1,747	2
9. *Cerithidea valida*	770	<1
10. *Mytella arciformis*	204	<1
11. *Mallea ringens*	68	<1
12. *Pleuroploca princeps*	56	<1
13. *Murex* species	38	<1
14. *Turritella* species	37	<1
15. *Littorina fasciata*	23	<1
16. *Tellina* species	9	<1
17. *Cerithium* species	8	<1
18. *Vermetus* species	7	<1
19. *Olivella* species	6	<1
20. Opercula of *Natica* species	4	<1
21. *Spondylus* species	4	<1
22. *Bulla* species	2	<1
Total	107,257	

Note that the following data presentation, analysis and interpretation are directed primarily toward the burial features. Other aspects of the site, such as soil analysis, detailed ceramic analysis and interpretation of probable habitation refuse areas are not presented here since Lubensky plans to report on these separately.

Feature 1 (Funerary Urn, Squares A-2 and B-2, Main Cut).—This feature consists of an urn

TABLES 3-5.—Weight distribution (g) of each type of mollusk recovered from each level within cuts A, B, and F (numbered designations of mollusk types identified in Table 2)

TABLE 3.—Cut A

Level (cm)	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*Total*
0–10	430	8	14	64			74	26	43		–			–				–					659
10–20	520	6	36	72		26	49	54	27					5	2			–					797
20–30	1,834	56	92	364	185	63	87	126	183	24	–				7		5	–	2				3,028
30–40	2,560	96	157	401	15	26	130	238	99	11	45		6		6		1	–	–			–	3,791
40–50	1,221	44	100	163		5	40	106	10	5				–				7	2			2	1,705
50–60	2,200	114	151	376	26	17	105	187	47	13	–		6	19				–					3,261
60–70	2,337	113	70	202	19	69	142	73	95		–			8					–			–	3,128
70–80	1,586	511	260	44	48	89	145	9	8					–	–				–			–	2,700
80–90	5,134	925	545	24	80	297	40	15				56							–		4		7,120
90–100	4,477	885	276		78	153	5	19			–								–				5,893
100–110	264	164	20												–				–				448
Total	22,563	2,922	1,721	1,710	451	745	817	853	512	53	45	56	12	32	15		6	7	4		4	2	32,530

TABLE 4.—Cut B

Level (cm)	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*Total*
0–10	92	5		10	23	16	21	60	11		–				–					–			238
10–20	2,105	48	105	324	158	10	229	183	38	80										–			3,280
20–30	3,675	41	114	354	25	19	134	97	55	60					4	–				–			4,578
30–40	1,488	5	24	76			65	55	7	2		–				–				–			1,722
40–50	2,638	49	180	230		48	118	55	34	2					4	–	2			–			3,360
50–60	1,543	79	75	180	1,084	34	153	104	25	5	4			4		–			2				3,292
60–70	1,530	97	52	57	–	8	94	68	41	2										4			1,953
70–80	1,500	567	354	19	129	101	41	49	18			–				–				–			2,778
80–90	5,878	2,183	1,630		80	261		41	21			–				–							10,094
90–100	555	112	48	11		61						–					–						787
Total	21,004	3,186	2,582	1,261	1,499	558	855	712	250	151	4			4	8		2		2	4			32,082

TABLE 5.—Cut C

Level (cm)	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*Total*
0–10	29			–	4				1					–									34
10–20	808	17	42	92	4	86	45	83	5							4							1,186
20–30	1,213	38	32	81		62	23	66	2									–					1,543
30–40	6,282	1,487	1,300	2	31	314	55	27			11		26	1		5							9,515
40–50	8,662	2,385	533	2	183	247		6			8												12,026
50–60	13,989	2,363	783		127	237																	17,499
60–70	694		5		16	15																	730
70–80	69	28	15																				112
Total	31,746	6,318	2,710	177	365	961	123	182	8		19		26	1		9						–	42,645

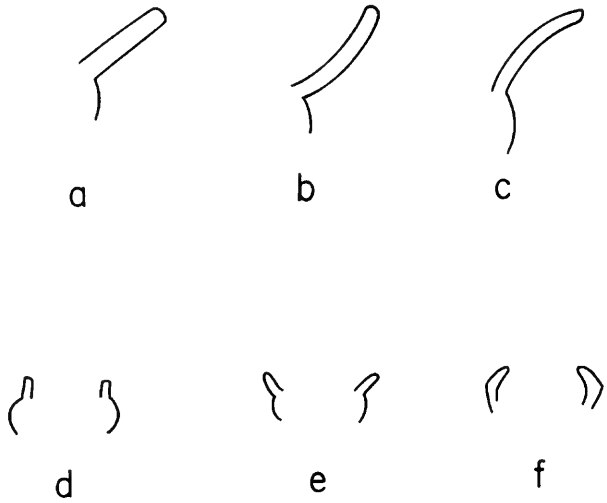

FIGURE 7.—Classification of urn neck form: *a*, straight; *b*, convex; *c*, concave; *d*, parallel; *e*, everted; *f*, inverted.

that was partially excavated in 1971 by a high school class from Guayaquil. The urn itself was later removed and reconstructed (Figure 8); however, the contents had been removed by the class and only faunal remains are available for analysis. The bottom of the urn was located at a depth of 1.23 m below ground level. The urn itself is nearly complete and displays a flat lip, everted rim, and straight everted neck. The base forms a rounded point. Dimensions are as follows: maximum rim diameter, 50 cm; maximum urn diameter, 70 cm; height, 92 cm; rim thickness, 23 mm; body thickness, 13 mm.

FEATURE 2 (Funerary Urn, Squares B-1 and B-2, Main Cut).—This urn was partially exposed in 1971 by the Guayaquil students, at which time the urn covering and some of the contents were removed. The remainder of the feature was excavated and removed in 1972. Little information on the position of bones and artifacts is available. The urn itself (Figure 9) displays an interiorly beveled lip, direct rim, straight inverted neck, and a round-pointed base. The only decoration is a thin, narrow band of red slip around the rim. Dimensions are as follows: maximum rim diameter, 49 cm; maximum urn diameter, 75 cm; height, 105 cm; rim thickness, 23 mm; body thickness, 13 mm.

Additional artifacts include a compotera plate found in an inverted position below the skeletal remains, 12 complete metal rings, one metal ring fragment, one fragment from a copper tweezers, one flat gold-silver ornament, and 176 shell beads. The compotera plate displays a tapered lip, straight parallel rim, with a carination 11 mm below the lip. Decoration is confined to an incised series of straight and wavy lines on the interior plate surface (Figure 10). The texture is smooth with no slip. The color is gray with some brown-black areas. Horizontal striations occur on the outside surfaces. Dimensions are as follows: maximum rim diameter, 155 mm; diameter at carination, 153 mm; height of plate, 42 mm; plate thickness 4–6 mm.

Of the shell beads, 10 are type A, 77 are type D, 18 are type E, and 81 are type F. Two of the type D beads are encased with a thin layer of copper.

Because the feature was exposed in 1971, there

FIGURE 8.—Reconstructed urn from feature 1.

FIGURE 9.—Funerary urn from feature 2.

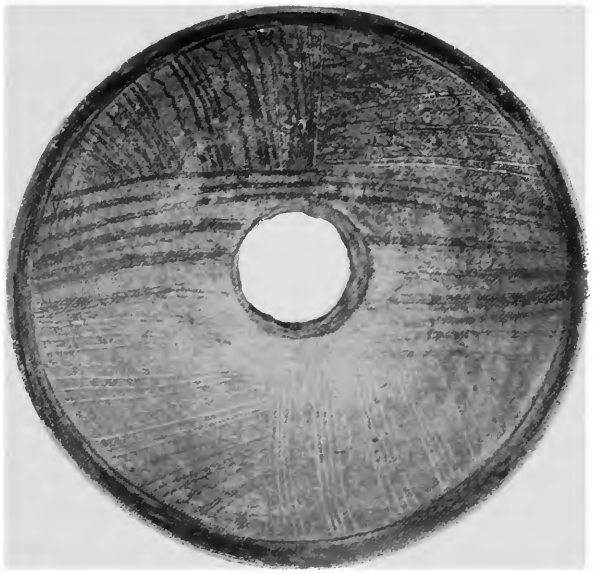

FIGURE 10.—Incised design on compotera plate from feature 2.

is no assurance that the bone sample recovered for analysis represents the entire bone assemblage originally present. The recovered sample weighs 11,424 g and represents at least 14 persons: eight adults and six subadults. Tables A1 and A51 present the minimum number of individuals represented by each type of bone for adults and subadults respectively. Most material was very fragmentary and all types of bones were not equally present. Two tibia shaft fragments display black charring, evidence of brief exposure of the bone to fire, probably after the flesh had decomposed.

At least eight adults are represented by proximal right femora. Pubis morphology suggests that of these, three are male and one is female. The remaining four are of unknown sex. Sex cannot be estimated reliably for subadult remains.

Adult ages at death were estimated using the microscopic method on complete cross-sections taken from the midshafts of the eight right femora. The adjusted counts and estimates are summarized in Table 6.

Subadult bone representation is summarized in Table A51. The right femur occurs with the highest frequency (five). The relative sizes of the femora suggest that at least six subadults are

TABLE 6.—Ages estimated for adults in feature 2 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
2-1	86	9	24	7	23	M
2-2	162	66	0	0	48	F
2-3	110	30	6	1	41	
2-4	155	34	18	2	55	
2-5	106	42	0	0	45	
2-6	150	44	6	2	58	
2-7	142	59	1	0	66	
2-8	142	76	0	0	73	

present of the following ages at death (in years): 0.2, 0.2, 1.0, 2.0, 3.0, and 5.0.

FEATURE 3 (Funerary Urn, Square C-2, Main Cut).—The feature was initially exposed in 1971, at which time the entire contents were removed. The urn itself was removed in 1972 and reconstructed (Figure 11). The rim portion of the urn is not present, but the base displays a rounded point. Dimensions are as follows: maximum diameter, 68 cm; height (without rim section), 88 cm; body thickness, 16 mm.

No skeletal remains are available for analysis.

FEATURE 4 (Funerary Urn, Square C-1, Main Cut).—This feature was excavated and removed in 1972. Information on bone positions within the urn is not available, although one photograph of the exposed bones in situ shows no obvious articulations. The urn itself was reconstructed in 1972 (Figure 12) and displays a rounded lip, direct rim, straight inverted neck, and a round-pointed base. The color of the outside surface is uniformly orange-brown. Dimensions are as follows: maximum rim diameter, 50 cm; maximum urn diameter, 70 cm; height, 97 cm; rim thickness, 29–35 mm; body thickness, 17 mm.

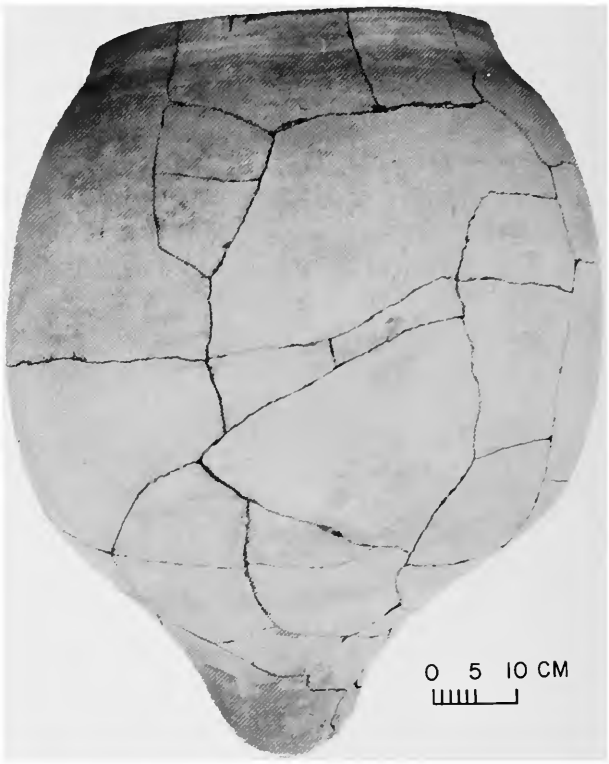

FIGURE 12.—Reconstructed urn from feature 4.

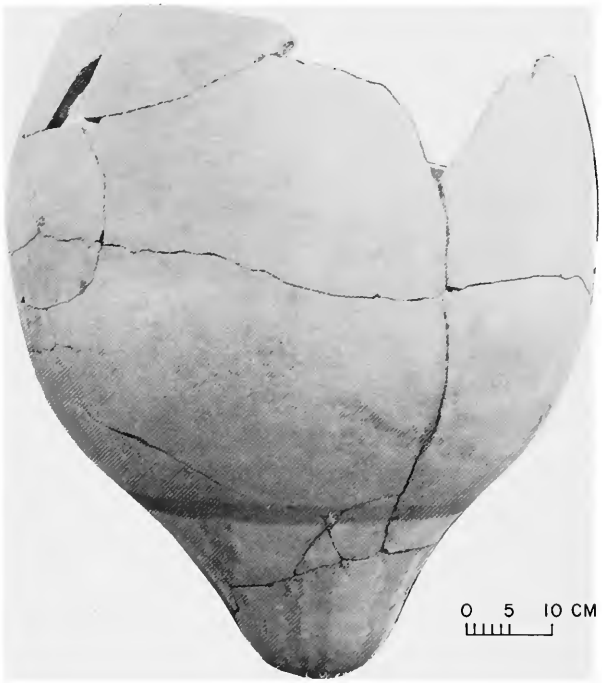

FIGURE 11.—Funerary urn from feature 3.

An inverted urn covering was apparently present, but is not available for measurement.

Additional artifacts include one metal ring and one compotera (Figure 13). The compotera was reconstructed from three broken sections found in different parts of the urn. It displays a lip beveled interiorly, a straight everted rim with a carination 21 mm below the lip. There are no decorations, but a smooth red slip occurs on all external surfaces except the rim. Vertical striations occur on the base and irregular striations occur on the plate. Dimensions are as follows: maximum plate diameter, 150 mm; diameter at plate carination, 133 mm; diameter at junction of rim and plate, 40 mm; base diameter, 142 mm; maximum height, 121 mm; plate thickness, 5 mm; base thickness, 7–8 mm.

The urn contained 6056 g of human bone representing six adults and two subadults. Tables

A2 and A52 summarize the numbers of individuals represented by each type of bone. Of the adults, three are males and three are females as suggested by cranial morphology. Table 7 presents adult ages at death as estimated from femoral cortical microstructure.

Ages at death for the two subadults are about seven and 17 years. The older is represented only by both humeri with proximal epiphyses not united, distal epiphyses united; left femur with distal epiphysis not united; left clavicle with the medial epiphysis not united; an occipital with basilar synchondrosis not united; and nine vertebrae. Size of the bones suggests male sex.

The younger subadult remains are too fragmentary to allow accurate measurement, but general size suggests an age of about seven years.

FEATURE 5 (Funerary Urn, Square C-1, Main Cut).—This feature was excavated and removed in 1972. Field notes and photographs indicate no bone articulations, with most of the secondary remains resting on top of a compotera plate in the bottom of the urn. The urn was covered with a layer of sherds, which were later reconstructed to form a single urn missing the rim area. This urn covering measured 72 cm in diameter, 62 cm in height, with a body thickness of 5–8 mm. The base formed a rounded point.

The upright urn was reconstructed and displays a lip beveled interiorly, an everted rim, concave everted neck, and a round-pointed base. Decoration is confined to a red slip that extends down 40 mm from the lip on the outside surface. Dimensions are as follows: maximum rim diameter, 35 cm; maximum urn diameter, 53 cm; maximum height, 62 cm.

FIGURE 13.—Reconstructed compotera from feature 4.

TABLE 7.—Ages estimated for adults in feature 4 from femoral cortical microstructure

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*
4-1	89	21	33	42	23
4-2	135	74	0	0	71
4-3	154	49	4	0	64
4-4	85	24	11	2	31

The compotera plate mentioned above consists of the complete plate only, which displays a lip beveled interiorly, concave everted rim with a carination 19 mm below the lip. Below the carination, the base of the plate tapers to the plate-pedestal junction. The rim is irregular in shape. An incised decoration occurs in the interior plate surface (Figure 14). The surface has rough texture and no slip; horizontal striations occur on the rim. Dimensions are as follows: rim diameter, 177–195 mm; diameter at carination, 172–181 mm; diameter at plate-pedestal junction, 56 mm; rim thickness, 7 mm.

A second compotera plate was reconstructed from fragments within the urn. The plate displays a rounded lip, straight everted rim, and a flat base. Two incised lines extend around the circumference of the rim. In addition, five groups of white vertical incised lines occur on the inside of the rim. The groups contain 9, 9, 11, 12, and 15 lines respectively. The lines are 3–5 mm apart and 30–36 mm long. Similar lines occur on the flat portion of the inside plate surface but they are too obliterated to count. A red slip occurs on all surfaces; the texture is smooth. Dimensions are as follows: maximum rim diameter, 189 mm; diameter at plate-pedestal junction, 86 mm; plate thickness, 8–10 mm.

Also present was a complete ceramic jar (Figure

15), which displays a rounded lip, everted rim, concave everted neck, and no appendages. Decoration is confined to a single line of punctations around the neck. The punctations are 2 mm apart. The texture is smooth on all outside surfaces except the base. Horizontal striations occur below the neck; vertical striations above the neck. Dimensions are as follows: rim diameter, 89 mm; neck diameter, 45 mm; body diameter, 92 mm; maximum height, 115 mm; rim thickness, 7–8 mm; body thickness, 5–6 mm.

Additional artifacts include the fragments from a mano and metate, two metal rings, two type A shell beads, and two large *Anadara grandis* shells.

Human remains from this feature consist only of 841 g of bone representing the relatively complete remains of two children. Table A53 summarizes the number of each bone type present. The degree of dental formation in each individual suggests ages of 5.5 years and 1.0 years.

FEATURE 6 (Funerary Urn, Square A-3, Main Cut).—This feature was initially exposed in 1972 and then excavated and removed by the author in 1973. The urn extended from the ground surface to a depth of about 1 m. Two large (10 cm diameter) roots had grown through the upper third of the urn (Figure 16). The upper portion within the urn contained many sherds and a few bones mixed with a loose dark soil. This extended down to a depth of 40 cm where a compact layer of human bones occurred (Figure 17). No bones within this concentration were articulated. A second concentration of human bones extended from a depth of 72 cm down to the bottom of the urn (Figure 18). Within this concentration the articulated femora, tibiae, fibulae, and foot bones of a single individual were found. All other bones

FIGURE 15.—Ceramic jar from feature 5.

FIGURE 14.—Incised decoration on interior plate surface, feature 5.

FIGURE 16.—Feature 6, showing growth of roots through urn.

FIGURE 17.—Upper concentration of human remains within feature 6.

were not articulated. Below the skull shown in Figure 18 were one spindle whorl and several large perforated oyster shells, aligned in a single row. A total of 56 shell beads were found in the urn. Of these, 42 are type A, 11 are type D, one is type F, and two are type H.

The funerary urn itself displays a lip beveled interiorly, direct rim, concave inverted neck, no decorations, and a round-pointed base. Dimensions are as follows: rim diameter, 55 cm; maximum urn diameter, 86 cm; height, 96 cm; rim thickness, 20 mm; body thickness, 18 mm.

Skeletal remains from this feature consist of 5798 g representing four adults and five subadults. The contents of the skeletal concentration at the bottom of the urn are presented in Table A3. All bones within this concentration are probably from the same individual. Although only bones of the legs were articulated, nearly the entire skeleton is present. Male sex is suggested

FIGURE 18.—Lower concentration of human remains within feature 6, showing articulation of lower legs.

by the general morphology of the skull and pelvis and femoral head diameters of 45 mm. The application of Kerley's (1965) method to a left femoral midshaft cross-section produces an age estimate of 71 years from totals of 201 secondary osteons, 62 osteon fragments, 2 percent lamellar bone, and no primary osteons. This age estimate is compatible with skeletal evidence of advanced cranial suture closure, extensive pubic symphysis metamorphosis, marked osteophytic vertebral lipping, and advanced breakdown of the joints.

All additional skeletal materials are very fragmentary and concentrated above the articulated male. These remains consist of three more adults and five subadults. Total bone representation within this feature is summarized in Tables A4 and A54.

The additional adult remains consist of at least one male, age 25–30 years and one female (humerus head diameter of 37 mm). The age estimate for the male is based upon pubic symphysis morphology. The age for the female cannot be determined; however, sections of two femoral shaft fragments from apparently different individuals gave estimates of 63 years and 61 years. Specific counts for these specimens are as follows: secondary osteons 134 and 146; osteon fragments 60 and 47; no lamellar bone; no primary osteons.

One proximal hand phalanx shows evidence of burning. The area is charred (black), which suggests minimal exposure to low temperature fire after flesh had decomposed.

Rodent tooth marks occur on shafts of a femur and radius.

The subadults are represented by only a few bones. Four subadults are represented by left temporals, which generally suggest ages at death of between one and three years. In addition one left femur, approximately 180 mm in length, represents a child of about three years. Femoral epiphyses indicate an adolescent, between 11 and 15 years is also present.

Feature 7 (Funerary Urn, Square A-3, Main Cut).—This feature consists of a funerary urn with an inverted urn covering excavated and removed in 1972. According to field notes, this feature extended from near the surface to a depth of 98 cm. The human remains were concentrated within the lower urn.

The urn covering was reconstructed and displays a rounded lip, everted rim, straight everted neck, and rounded base. There are no appendages. A trace of red slip occurs on the outside of the rim extending down from the lip about 20 mm. Dimensions are as follows: rim diameter, 58 cm; maximum urn diameter, 61 cm; height, 55 cm; rim thickness, 20 mm; body thickness, 10 mm.

The upright urn was also reconstructed and displays a rounded lip, direct rim, straight inverted neck, and a round-pointed base. There are no appendages, and decoration is confined to a trace of red slip extending around the rim. Dimensions are as follows: rim diameter, 50 cm; maximum urn diameter, 76 cm; height, 80 cm; body thickness, 12–22 mm.

Twenty-two shell beads were recovered from the feature. Of these, four are type A, and 18 are type D.

One metal ring was recovered when the soil from the feature was sifted. Field notes also list one atlatl (hook) and one ceramic disc from this feature.

Human remains weigh 20,567 g and represent at least 18 individuals; 13 adults and five subadults (Tables A5 and A55). Of the total of 18 individuals, at least five adults and one subadult are represented by burned bones. At least six individuals are represented by burned mandibles. Of these, four are completely calcined, and two show only charring. One of the calcined mandibles is clearly a young infant or child. The following additional bones show evidence of burning: three left and two right temporals; fragments from four adult frontals; 197 cranial fragments, of which 84 are white (completely calcined), 80 are gray, and 33 are black; 21 vertebrae fragments, three cervical (white) and 18 lumbar (black); one maxilla fragment; 13 slightly charred innominate fragments representing at least one male and one female; 196 long bone fragments, of which 168 are calcined, 22 are gray, and 106

are black; 38 rib fragments, of which six are white and 32 are black; and one black sacrum fragment. All of these cremated remains represent two categories of firing: those completely fired (calcined), and those only moderately fired, black or gray. The completely fired calcined specimens represent firing in the flesh with transverse type fractures and extensive shrinkage. Nearly all parts of the skeleton are represented by this stage. The charred remains could represent either the burning of dry bone or the incomplete burning of bone in the flesh at a lower temperature for a shorter period of time. The latter is more probable since so many additional calcined bones are present. Consistently the bones show more extensive calcination on the dorsal side of the skeleton, suggesting burning in the flesh with the skeleton lying on its back on top of the crematory fire or lying on its stomach below the fire.

Morphology of the pelvis and crania indicate at least three males and three females are present. Ages at death were estimated for five of the adults from microscopic analysis of femoral cortical remodeling. This analysis suggests ages at death of 25, 35, 38, 54, and 55 years. The 38-year-old is a female; all other ages are estimated for individuals of undertermined sex. These data are presented in detail in Table 8.

At least five subadult individuals are present. According to the stage of dental development, the oldest subadult was about 13–14 years at death. The skeleton is generally complete. The second subadult is represented by both femora, two humeri, one tibia shaft, a right ischium, both pubes, and a left clavicle. A right femoral length of 295 mm suggests an age at death of eight years. The third subadult is represented only by a right femur and left radius. The left radius length of 105 mm and estimated right femur length of 150 mm suggests an age at death of 1–2 years. Subadult four is represented by both femora and one left humerus. A right femur length of 130 mm suggests an age at death of 1–1.5 years. The fifth subadult is represented by most of the major long bones. A right humerus length of 82 mm suggests that this infant died at the time of birth or soon after.

TABLE 8.—Ages estimated for adults in feature 7 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
7-2	89	29	5	1	38	F
7-3	117	57	2	0	55	–
7-4	62	21	13	3	25	
7-5	91	26	13	2	35	
7-6	117	56	0	0	54	–

One of the calcined mandibles mentioned earlier is from a young child or infant. Although it is possible that it represents one of the five subadults listed above, it more probably represents a sixth individual.

Evidence of rodent gnawing occurs on a right fibula shaft.

FEATURE 8 (Funerary Urn, Square A-3 and northern extension, Main Cut).—This funerary urn with inverted urn covering was initially exposed in 1972 and later excavated and removed by the author. The covering extended from ground surface to a depth of only 25 cm and consists of only the rim with about 20 cm of the sides remaining (Figure 19). A few skeletal remains were found within the covering. The lower urn extended from a depth of 25 cm to about 92 cm and was filled with secondary human skeletal material (Figure 20). No bones were articulated within the urn.

The lower urn displays a lip beveled interiorly, straight everted neck, and a base with a rounded point. Dimensions are as follows: maximum rim diameter, 35 cm; maximum urn diameter, 51 cm; height, 67 cm; rim thickness, 16 mm. The only artifacts within the urn were one type A bead, and one type F bead.

This feature contains 14,253 g of bone representing 15 individuals: eight adults and seven subadults. Tables A6 and A56 present the numbers of adults and subadults represented by each type of bone within the feature. Of these, the

FIGURE 19.—Feature 8, funerary urn with inverted urn covering.

FIGURE 20.—Skeletal content of feature 8.

following bones were found within the inverted urn covering: adult, two left temporals and one right temporal, one left and one right maxilla, one left mandible, several fragments of long bones, one innominate, one cranium, one proximal hand phalanx, the distal end of a right ulna, several teeth, and three calcined warped fragments from a rib, cervical vertebra, and parietal; subadult, one right temporal, one right scapula, two thoracic vertebrae, and one left humerus. The adult bones represent at least two individuals, whereas the subadults all represent a single infant, age 6 months to 1 year.

Within the entire feature, at least eight adults are represented by radii, left ulnae, right temporals, first cervical vertebrae, right calcanea, and right tali. Of these, four are probably male, two are probably female, and two are of undetermined sex. Ages were estimated for three of the adult males from femoral cortical thin sections. The following counts and estimates were derived. 8-1: secondary osteons, 87; fragments, 40; percentage of lamellar bone, 8; primary osteons, 4; age estimate 35. 8-2: secondary osteons, 117; fragments, 26; percentage of lamellar bone, 18; primary osteons, 1; age estimate, 40. 8-3: secondary osteons, 132; fragments, 49; no lamellar bone; no primary osteons; age estimate, 57. One female pubis displays features indicating an age of 45 as estimated using the Gilbert and McKern system (1973). Three male pubes produce ages similar to

those estimated above from femoral microstructure. Two crania (one male and one of undetermined sex) display open sutures (including the basilar synchondrosis) and recent eruption of third molars, which suggests an age between 20 and 25 years. The age of the remaining two adults cannot be determined.

At least seven subadults are present in Feature 8. Although only six are indicated by the most frequent bone (right temporal), seven were detected when the material was sorted by size. Dental formation and long bone lengths suggest the following approximate ages at death: 14, 8, 4, 2, 0.5, 0.5, and newborn.

Seven adult long bone shaft fragments display rodent tooth marks.

FEATURE 9 (Primary Skeleton, Squares B-0, C-0, and C-1, Main Cut).—This feature consists of an extended adult male primary skeleton with a concentration of infant bones. The feature was initially exposed in 1972, at which time some associated artifacts were removed. In 1973 the feature was excavated and removed by the author. The adult skeleton was lying on its right side with legs and arms extended (Figure 21). The skull was SW of the postcranial material, lying on its right parietal facing SE. Measurements pertaining to the skeleton in situ were maximum length, 1.7 m; maximum width, 27 cm; depth to skull, 81 cm. The skeleton was lying within the shell layer just above the layer of clay. The concentration of infant bones occurred immediately S of the adult's left femoral midshaft. No articulation was observed within the concentration of infant bones, but it may have been disturbed by the 1972 excavation. Many sherds and shells were scattered over the entire area; however, the following appear to have resulted from intentional placement with the skeletal remains: two small shells, one in each eye orbit of the adult; a compotera with base and plate separated; one ceramic vessel; six bundles of flat copper plates; and four shell beads, two type D and two type G.

The compotera was removed in 1972. A photograph shows the base located immediately S and above the left tibia midshaft with the plate just N of it. The reconstructed compotera (Figure 22) displays a flat lip and concave everted rim. A carination occurs 19 mm below the lip. There are no appendages and no decoration. The color is red-orange with small black areas. All outer surfaces of the plate and base are smooth and display a red slip. Irregular polishing striations occur inside the plate; with horizontal striations on the plate's outer surface. The base has vertical, well-defined striations. Dimensions are as follows: maximum rim diameter, 187 mm; diameter at carination, 175 mm; diameter at plate-pedestal junction, 53 mm; base diameter, 181 mm; height, 254 mm; plate thickness, 7–9 mm; base thickness, 6–8 mm.

The ceramic jar was also removed in 1972. According to notes, it was found above the lower legs, apparently near the compotera. The vessel is complete (Figure 23) and shows a concave everted neck with an oval, carinated, slightly asymmetrical body and rounded base. There are no appendages, and decoration is confined to a single line of punctations, with a single hole in the center of each, extending around the neck. The punctations are 4 mm wide and 6 mm apart. The texture is smooth outside and rough inside the vessel. A red slip is present with poorly defined borders. The color is red-orange with areas of black and gray. The surface shows vertical striations on the rim and body with some horizontal striations below the carination. The rim and body are very asymmetrical with one side of the base indented. Dimensions are as follows: maximum rim diameter, 161–173 mm; neck diameter, 79 mm; diameter at carination, 183 mm; maximum height, 209 mm; height to neck, 131 mm; height to carination, 60 mm; rim thickness, 7–10 mm.

Six packets of small triangular copper plates (Figure 24) were found associated with the skeleton: two from the area of the feet (removed in 1972); one from the pubic area, immediately S of the left femoral head; one from immediately below and slightly N of the cranium; one from below the pelvis; and the last from above the left ilium (Figure 25). Packets from above the ilium

FIGURE 21.—Feature 9, extended primary skeleton.

FIGURE 22.—Reconstructed compotera from feature 9.

FIGURE 23.—Ceramic jar from feature 9.

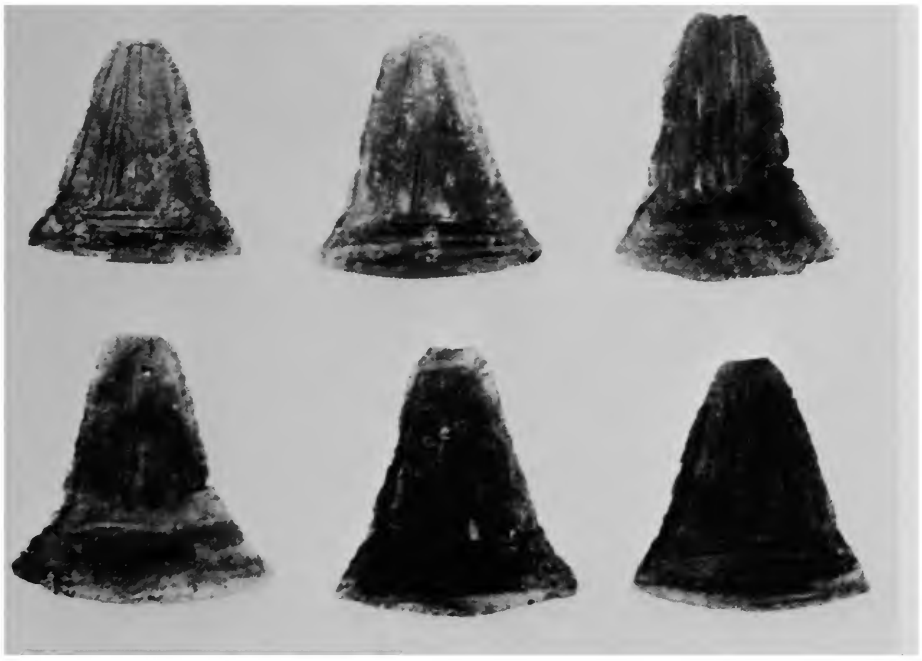

FIGURE 24.—Copper plates from feature 9.

FIGURE 25.—Location of copper plates on left ilium, feature 9.

and from the pubic area each contain 10 individual plates. The other four each contain 20 plates. Dimensions of the plates have been reduced slightly by erosion, but the smallest measures 30 mm in length by 27 mm in width at the base. The largest length measurement is 41 mm and the largest breadth is 36 mm.

An additional artifact associated with this skeleton is one possible atlatl weight.

The skeleton itself is fragmentary but generally complete. General morphology, especially that of the pubis, suggests male sex. Microscopic examination of a right femoral cross section revealed an average of 142 secondary osteons, 36 osteon fragments, 6 percent lamellar bone, and one primary osteon, suggesting an age of 53 years. This estimate is compatible with the occurrence of considerable osteophytosis of the vertebral bodies and long bone joint changes, but is older than indicated by the minimal suture closure and degree of pubic symphyseal metamorphosis.

The subadult remains contain at least two individuals, both infants. The older is about one year of age and consists of most of the skull, both femora, ulnae, and innominates, the right tibia, and several vertebrae.

The younger infant consists of the left femur, left radius, several ribs, vertebrae, and cranial fragments. The infant apparently died at birth or soon after.

FEATURE 10 (Funerary Urn, Square A-3, Main Cut).—This feature was excavated and removed in 1972. Field photographs and information on bone positions within the urn are not available. The urn itself was reconstructed in 1972 (Figure 26) and displays a flat lip, straight inverted neck, and a flat base. The urn displays no appendages and no decorations. Smoothing striations are visible on the surface. Dimensions are as follows: maximum rim diameter, 39 cm; maximum urn diameter, 60 cm; height, 67 cm. Additional artifacts from this urn include one pottery vessel reconstructed from sherds inside the urn, one pottery disk, and five metal rings. The vessel displays a lip beveled interiorly, an everted rim, a concave everted neck, and an outside decoration of red slip that extends from the lip down 30 mm, and a white slip that extends from the red slip down an additional 30 mm. The overall color is reddish orange with brown and black spots. Dimensions are as follows: maximum rim diameter, 30.5 cm; maximum urn diameter, 44 cm; estimated height, 48 cm; rim thickness, 10–11 mm; body thickness, 4–7 mm. Since the base of the vessel is missing, the actual height is 37 cm.

Skeletal remains from this feature consist of 1083 g of human bone, representing at least two children and one adult. The adult is represented only by one proximal hand phalanx and one femoral shaft fragment. Subadult bones from this feature are presented in Table A57, and represent the generally complete remains of two children, one aged 4.5–5.0 years, and the other about 1.5 years.

FEATURE 11 (Funerary Urn, Square A-3, B-3, Main Cut).—This feature consists of a funerary urn with two inverted urn coverings. The feature was first excavated in 1972 when both of the coverings were removed. The lower upright urn was excavated by the author in 1973. Field notes indicate that both of the inverted urn coverings consisted only of the rim portions of the urns; the base and most of the sides of the urns were not present. The urn coverings extended from the surface down to the lip of the upright urn, a depth of 37 cm. The upright urn itself extended from this depth down to 1.13 m (Figure 27). According to field notes, some subadult bones were encountered within the urn coverings. Within the upright urn, bones were encountered just inside the rim and they continued down to a depth of about 50 cm. At that level occurred the articulated femora, tibiae, and foot bones of an adult female (Figure 28). The lower legs were horizontal, while the femora extended vertically in the NE part of the urn. They were flexed abnormally so that the angle between the anterior surfaces of the tibiae and femora was about 90 degrees. A complete pottery vessel was found within the urn on the north side of the skeletal concentration at a depth of 40 cm. From the top of the urn to a depth of about 50 cm, the soil was

FIGURE 26.—Reconstructed urn from feature 10.

FIGURE 27.—Feature 11, funerary urn with secondary bone deposit.

FIGURE 28.—Articulated leg bones of adult female within feature 11.

FIGURE 29.—Ceramic jar from feature 11.

FIGURE 30.—Incised design on ceramic jar from feature 12.

TABLE 9.—Ages estimated for adults in feature 11 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
11-1	101	27	1	0	45	F
11-2	127	33	0	0	49	F
11-3	107	34	0	0	48	F
11-4	144	43	1	0	58	F
11-5	109	26	3	0	38	M

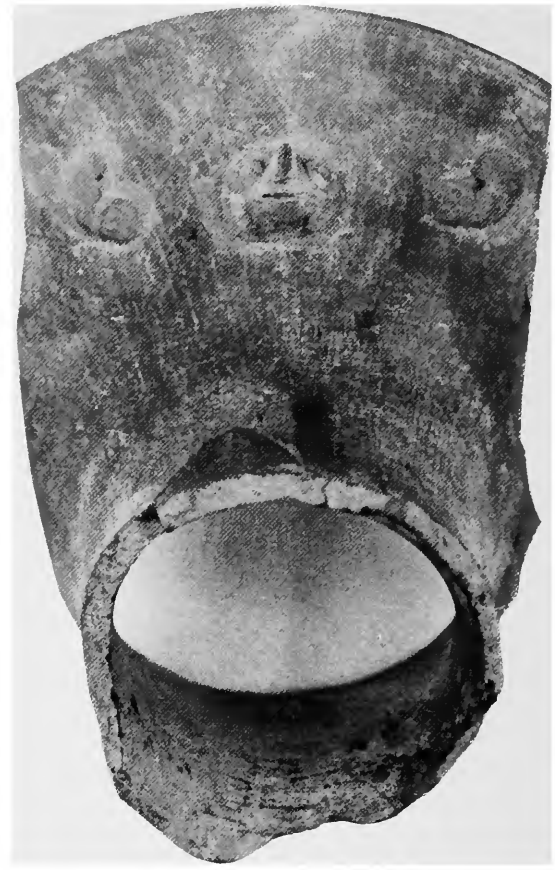

FIGURE 31.—Decoration on ceramic vessel from feature 13.

very loose and dark. From a depth of 50 cm to the bottom of the urn, the fill consisted of a thick, yellow soil.

The funerary urn itself displays a lip beveled interiorly, a rim interiorly thickened, and a concave everted neck. The base forms a rounded point. There are no appendages and no decorations. Dimensions are as follows: maximum rim diameter, 44 cm; maximum urn diameter, 68 cm; height, 76 cm.

Additional artifacts from this feature include six metal rings, 20 shell beads (15 type G and five type D), and one pottery vessel. The vessel (Figure 29) is complete, and displays a lip beveled exteriorly, an everted rim, a concave everted neck, a rounded oval body, and annular base. There are no appendages and no decorations. The texture is smooth with a thin red slip extending from the inside of the rim at a point 8 mm below the lip, over the lip, and down the external surface to a point 65 mm from the base. The color is orange-red with gray-black spots. The surface displays horizontal polishing striations on the exterior of the vessel from a point 65 mm above the base to a point 110 mm above the base. Vertical striations occur from a point 110 mm above the base to the

neck. Dimensions are as follows: diameter of the rim, 95 mm; diameter of the neck, 48 mm; diameter of the body, 150 mm; diameter at the constriction of the base, 61 mm; maximum diameter of base, 75 mm; maximum height of the vessel, 170 mm; height to the neck, 130 mm; and height to the base constriction, 14 mm.

Skeletal remains from this feature weigh 9730 g and represent at least eight adults and two subadults (Tables A7 and A58). Maximum head diameters of the adult femora suggest that six females, one male, and one adult of undetermined sex are present in the urn. Adult ages at death estimated from the femoral cortical microstructure of four females and one male are presented in Table 9. In addition, the morphology of the left and right pubes suggests that an additional female, age between 30 and 35 years, is also present. Only three complete adult skulls are present: two male and one female.

As Table A58 shows, the two subadults are poorly represented. Most of the bones represent a single individual whose maximum tibial length of 263 mm suggests an age at death of about 9 years. The second is represented only by cranial fragments (not listed in the table), the sizes of which suggest an infant that died at birth or soon after.

FEATURE 12 (Concentration of Sherds with Small Quantity of Human Bone, Squares B-0 and C-0, Main Cut).—This feature, excavated and removed in 1972, consists of a large concentration of broken pottery above a small concentration of secondary human adult bone. According to field notes, only portions of two pottery vessels were reconstructed from the broken sherds. The first of these consists only of the neck and rim of a jar displaying a rounded lip, everted rim, and concave everted neck; no approximation of body or base is possible. There are no appendages and no decorations except for a smooth red slip that occurs on the entire outside surface of the vessel and on the upper 15 mm of the internal surface. Horizontal striations occur on the inside of the rim. Dimensions are as follows: maximum rim diameter, 131 mm; maximum neck diameter, 55 mm; height from junction of neck to lip, 56 mm; rim thickness, 5–7 mm.

The reconstructed portion of the second jar consists only of about one-half of the rim. This displays a rounded lip and a concave everted neck. No part of the body or base is present. There are no appendages, and decoration consists of three rows of incised designs on the inside of the rim (Figure 30). The surfaces are highly polished, but display no slip. The overall color is gray-black. Vertical polishing striations occur over the entire outside surface. Horizontal striations occur only on the outside of the rim from the lip down about 60 mm. Dimensions are as follows: maximum rim diameter, 213 mm; height from junction of neck to lip, 105 mm; rim thickness, 7–12 mm.

One type D shell bead and, according to field notes, fragments of three metates, seven manos, and one obsidian fragment were also present.

Only 286 g of human bone are associated with this feature. Two adults, one male and one female, are represented by these bones. The specific bones present are as follows: one proximal third of a right femur (head diameter, 40 mm); five proximal hand phalanges; two proximal foot phalanges; two middle hand phalanges; one left and one right first metacarpal (from different individuals); one left and one right third metacarpal; one left and one right hand navicular; one cervical vertebra; one left and one right talus; one left and one right patella; one left first metatarsal; one left third metatarsal; one right fourth metatarsal; one right fifth metatarsal; two adult teeth, one central left maxillary incisor, and one mandibular third molar. No subadult bones are present.

FEATURE 13 (Funerary Urn, Adjoining Corners of Squares A-3, A-2, B-2, and B-3, Main Cut).—This feature consists of the lower portion of a fragmentary urn containing a small quantity of fragmentary human skeletal material. The feature was removed in 1972; no information is available on positions of bones or artifacts within the urn. Field photographs reveal no apparent bone articulation. The urn itself displays a round-

pointed base, a body thickness of 18 mm, and a maximum diameter of approximately 80 cm.

The urn contained the neck and rim portion of a ceramic vessel displaying a rounded lip, interiorly thickened rim, concave everted neck, with neither body nor base present. There are no appendages, but a decoration occurs on the neck consisting of clay additions forming a probable face with two ears (Figure 31). The surface texture is smooth, with no apparent slip. The inside color is black-gray; the outside color is orange-red with some gray areas. Vertical striations occur on the outside surface. Dimensions are as follows: maximum rim diameter, 209 mm; maximum neck diameter, 84 mm; height of rim above neck, 94 mm; neck thickness, 5-7 mm. On the inside of the rim, a 17 mm circular indentation occurs at the same point that the face is located on the outside surface.

Additional artifacts from this urn consist of 19 shell beads: two type A, seven type D, five type F, and five type H.

Human skeletal remains from this feature are very fragmentary and weigh 663 g. At least one adult (Table A8) and three subadults are represented. The size and robusticity of the bones (especially the scapulae) suggest the adult is a male. An exact age estimate is not possible due to the fragmentary nature of the material; however, stage two osteophytosis of the two lumbar vertebrae and the lack of breakdown in other joint surfaces suggest an age at death of about 40 years.

Two infants are represented by a right temporal, two left femora, and a right rib fragment. Maximum lengths of the two femora of 53 and 70 mm suggest that both infants died at birth or soon after. The third subadult is represented only by an adolescent metacarpal with the distal epiphysis not fused.

FEATURE 14 (Funerary Urn with Pottery Concentration, Southern Extension of Squares B-0 and C-0, Main Cut).—This feature consists of a small urn covered with sherds mixed with human bones. The pottery covering extended from above the urn 70 cm to the SW, so that the entire complex measured 1.04 m NE–SW, and 55 cm NW–SE. The sherd covering extended from the surface to a depth of 51 cm. The urn extended from a depth of 51 cm to 93 cm. The base of the urn was nearly in contact with the skull of feature 40, an extended primary skeleton (Figure 32). Within the urn, a single adult phalanx was found near the rim. Additional bones were not encountered until a depth of 65 cm. At this level occurred a large sherd surrounded by a concentration of human bones. Most of the infant bones were concentrated below the large sherd in the extreme bottom of the urn. Burned and unburned bones were mixed throughout the concentration. No articulation was observed.

The urn itself measures 42 cm in height, about 50 cm in diameter, and displays a flat base with neither decoration nor appendages. One type I shell bead represents the only artifact found within the urn.

Human remains from this feature weigh 3137 g and represent at least three adults and three subadults. Detailed inventories of adult and subadult remains are presented in Tables A9 and A59.

Burned bones from this feature are either lightly burned and blue-gray in color or are completely calcined. Blue-gray fragments consist of 14 cranial, 24 long bone fragments (some definitely tibia), and one medial hand phalanx. Calcined remains are from a left mandible, a right lumbar neural arch, four ribs, and one fibula. All of the burned material is adult.

Morphology of the adult bones suggests that at least one male and one female are present. Morphology of one left female pubic symphyseal face suggests an age of 40–50 years. Microscopic examination of a femoral cross-section from this individual revealed 117 secondary osteons and 44 osteon fragments, with no lamellar bone and no primary osteons remaining. This suggests an age of 49 years. For the subadult material, left femoral lengths of 75 mm, 105 mm, and 165 mm suggest ages at death of between birth and two months, about six months, and about two years respectively.

FEATURE 15 (Funerary Urn, Square B-0, Main

FIGURE 32.—Feature 14 (urn) and feature 40 (primary skeleton).

Cut).—This feature was excavated and removed in 1972. The urn extended from near ground surface to a depth of about 60 cm. No information is available on bone or artifact positions within the urn.

The urn itself (Figure 33) was reconstructed in 1972 and displays a rounded lip, angular everted rim, concave everted neck, and rounded base. There are no appendages, and decoration is confined to a red slip on the interior surface of the rim. The overall color is orange-brown with black-gray spots. Dimensions are as follows: maximum rim diameter, 60 cm; maximum urn diameter, 66 cm; maximum height, 52 cm; rim thickness, 12 mm; body thickness, 10 mm.

Additional artifacts listed from this urn are two manos, one metate fragment, four type A shell beads, and the neck and rim of a pottery vessel. The vessel displays a tapered lip and concave everted neck. Decoration consists of 10 horizontal bands of an incised pelican motif: three bands on the inside and seven bands on the outside. On the inside, the motif extends down from the lip 56 mm (Figure 34). On the outside (Figure 35), the motif extends from the lip to the junction of the body. A white pigment occurs within the inci-

FIGURE 33.—Reconstructed urn from feature 15.

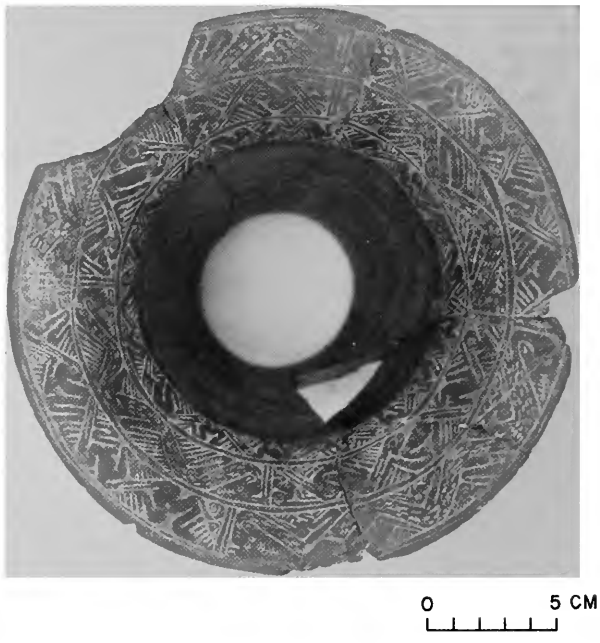

FIGURE 34.—Incised decoration on inside of vessel rim from feature 15.

FIGURE 35.—Incised decoration on external rim surface of vessel from feature 15.

sions, highlighting them against the gray-brown background of the remainder of the vessel surface. All surfaces are smooth and slightly polished with no slip. Irregular striations occur inside the rim. Dimensions are as follows: maximum rim diameter, 210 mm; minimum neck diameter 82 mm; height of existing fragment, 112 mm; rim thickness, 6–7 mm.

Human skeletal remains from this urn weigh 6277 g and represent at least five adults and three subadults. Detailed bone inventories for adults and subadults are given in Tables A10 and A60. Innominate morphology suggests that at least three females and one male are present. Sections were prepared from two adult femora. One had been infiltrated with soil materials so that structures were not visible. The other section displays 106 secondary osteons, 27 osteon fragments, 7 percent lamellar bone, and one primary osteon. This suggests an age at death of about 37 years.

The three subadults are irregularly represented. In fact, only two individuals are indicated by any single bone type (left humerus, right ulna, femur, tibia, and temporal). The youngest child displays a right ulna measuring 62 mm, which suggests an age at birth or soon after. A second right ulna length of 79 mm suggests an age of about six months. The oldest child is represented only by a right tibia, left humerus, and right femur. The estimated maximum length of the femur is about 250 mm, which suggests an age at death of about six years.

FEATURE 16 (Funerary Urn, Squares A-0 and B-0, Main Cut).—This feature consists of a fu-

FIGURE 36.—Reconstructed urn from feature 16.

FIGURE 37.—Articulated pelvis and leg bones of adult male, feature 17.

nerary urn with no covering, which was excavated and removed in 1972. Field notes reference an occipital bone found in the extreme bottom of the urn, but no other information on bone or artifact positions. The urn was encountered just below the surface.

The urn (Figure 36) displays a lip beveled interiorly, an everted rim, a straight everted neck, and a round-pointed base. There are no appendages, and decoration is confined to a red slip on the exterior surface of the body. Dimensions are as follows: rim diameter, 38 cm; maximum urn diameter urn, 60 cm; height, 72 cm; rim thickness, 17–20 mm; body thickness, 13–17 mm.

Additional artifacts include 22 shell beads (19 type A and three type D) and, according to field notes, five manos and two metate fragments.

Human skeletal remains weigh 3915 g and represent at least two adults and two subadults (Tables A11 and A61). Adult bone morphology strongly suggests one male and one female are present. The symphyseal face of the left female pubis displays a complete ventral rampart, complete rim formation with some deterioration, indicating advancing age. A section from the right femur of the female shows 124 secondary osteons, 57 fragments, and no lamellar bone nor primary osteons. This suggests an age at death of about 58 years.

Subadult bones represent at least two individuals, one about three years and the other about 12 years.

FEATURE 17 (Funerary Urn, Square B-1, Main Cut).—This feature was initially exposed in 1972, at which time the urn covering was removed. The lower urn was excavated and removed by the author in 1973. According to field notes the covering was encountered just below the surface and contained no bone.

The bone deposit was first encountered within the lower urn at a depth of 35 cm, and it extended down to the bottom of the urn. At a depth of 52 cm, several subadult articulated ribs and thoracic vertebrae were encountered. At a depth of 57 cm, the articulated pelvis and lower legs of an adult male (Figure 37) were encountered. The legs were

very tightly flexed in a sitting position, so that both feet were below the innominates. Articulated left and right radii and ulnae occurred immediately N and S of the innominate area in correct anatomical position, but the humeri were not attached. Several vertebrae and ribs and both humeri from this individual were found within the urn but not in articulation. A decorated ceramic spindle whorl and a miniature ceramic compotera (visible in Figure 37) were found resting on top of the articulated sacrum. A concentration of infant bones occurred between the right femur and the right radius and ulna. Burned bones were concentrated below the infant bones. The extreme bottom of the urn was missing, but the space was filled with an adult skull resting on its right side.

The lower urn displays a lip beveled interiorly, a straight, inverted neck, with a round-pointed base. The color is brown and there are neither decorations nor appendages. Dimensions are as follows: rim diameter, 42 cm; urn diameter, 69 cm; height, 86 cm; rim thickness, 22–29 mm; body thickness, 19 mm.

Eighty-three shell beads were recovered: two type A, one type B, 66 type D, three type H, and 11 type J.

Human skeletal remains weigh 12,729 g and represent seven adults and seven subadults. Detailed inventory of the individual bone types is presented in Tables A12 and A62. At least seven adults are represented by left tali. Long bones are noticeably few, with only two left radii and ulnae present. Left femur size suggests at least three males and two females are present. Ages estimated from femoral sections are summarized in Table 10. The articulated individual is labeled 17-6.

Of 48 burned fragments, 37 are calcined and 11 are charred. The calcined bones include three fragments from a left mandible, one sphenoid fragment, one fragment from a thoracic vertebra, and 32 long bone fragments. Of the charred fragments, 10 are from long bones, and one is cranial.

Seven subadults are represented by left temporals. Ages were estimated by comparing femoral length with data provided by Merchant and Ubelaker (1977) for American Indian groups. Three femoral lengths of about 70 mm, one of 76 mm, and one of 85 mm suggest three individuals that died at birth or soon after. Additional lengths of 125 mm and 208 mm suggest ages of one and four years respectively.

TABLE 10.—Ages estimated for adults in feature 17 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
17-1	104	7	16	3	26	M
17-2	132	42	0	0	53	–
17-3	120	24	5	1	41	F
17-4	105	42	1	0	47	F
17-5	91	35	0	0	41	–
17-6	125	25	1	2	42	M

FEATURE 18 (Funerary Urn, Squares A-1 and B-1, Main Cut).—This feature was initially uncovered in 1972 and later excavated and removed by the author in 1973. The superior aspect of the urn was located 20 cm below surface level; however, pit outlines were distinguished which extended to surface level. The urn extended down to a depth of about 1 m.

Within the urn, the upper 20 cm (surface depth of 20–40 cm) contained a considerable quantity of human bone fragments mixed with many sherds, in a dark compact soil. A small quantity (about 5 percent) of these fragments are charred.

Below this bone concentration, at a depth of 40 to 60 cm occurred a concentration of sherds and the following adult bones: one mandible fragment, several teeth and cranial fragments, one first cervical vertebra, a right calcaneus and talus, one right middle foot phalanx and several carpal and metacarpal bones. All were clustered together, but none were articulated. The urn fill from 60 cm to the bottom of the urn contained sherds but no bone.

The urn itself is approximately 70 cm in diameter and 80 cm in height with a round-pointed

base. The neck and rim are missing. Additional artifacts found within the urn consist of 52 shell beads and one obsidian fragment. Of the shell beads, 40 are type A, six are type B, and six are type D.

Human remains weigh 7154 g and represent at least five adults and six subadults (Tables A13 and A63). The extreme variability in bone representation probably reflects the fragmentary nature of the material.

Size and robusticity of the adult material suggests that at least two males and two females are present. The males both display femoral head diameters of 47 mm. Ages of the adults cannot be assigned due to the fragmentary nature of the material, and the fact that considerable erosion of the periosteal surfaces of the long bone fragments prevents estimates from microscopic structure. Cranial fragments display united and nonunited sutures, probably indicating that both young and old adults are present.

Fifty-four bone fragments show evidence of burning. Five of these are cranial fragments and are charred. The remaining 39 fragments represent the post-cranial skeletons and are calcined with considerable warping and transverse fracture patterns.

The maximum number of subadults is represented by right temporals and right femora. The following are the estimated maximum lengths of the femora and the ages at death they imply: 64 mm, birth; 65 mm, birth; 75 mm, birth to 2 months; 100 mm, 6 months to 1 year; and 140 mm, 1 year to 1.5 years. Size of the bones of the largest subadult suggests an age between 10 and 15 years.

FEATURE 19 (Primary Skeleton, Square C-0 and Southern Extension, Main Cut).—The articulated adult male was first uncovered in 1972, at which time associated artifacts were removed before the skeleton was covered again with soil. It was reexposed and removed in 1973 by the author.

The skeleton was lying on its back with the skull WSW of the postcranial skeleton. It was lying within the shell layer at a depth of 45 cm to the top of the skull. Maximum dimensions of the skeleton in the ground were length, 1.6 m, and width, 39 cm. Preservation is fair, even though the skull, ribs, and feet were damaged during the first exposure. Associated artifacts consist of one ceramic disk, one type D shell bead, one large *Anadara grandis* shell, one fragment of a copper tweezers found at the feet, one triangular copper fragment, and one complete ceramic jar found just S of the skull. The jar (Figure 38) displays a rounded lip, everted rim, concave everted neck, rounded base, and no appendages. Decoration consists of four parallel rows of punctations, 2 mm in diameter: two rows around the rim, and two around the body. The outside surface is smooth with horizontal striations. The base and internal surfaces are rough. Dimensions are as

FIGURE 38.—Ceramic jar from feature 19.

follows: maximum rim diameter, 113 mm; minimum neck diameter, 56 mm; maximum body diameter, 133 mm; maximum height, 165 mm; height of lower row of decoration on body, 56 mm; height of upper row of decoration on body, 105 mm; height of decorations on neck, 128 mm; rim thickness, 6–8 mm; body thickness, 4 mm.

Morphology of the pelvis and femoral head diameters of 45 mm suggest male sex. The skeleton has some youthful features, particularly lack of suture union, and little wear on third molars; however, a section of the right femur revealed 109 secondary osteons, 36 fragments, 1 percent lamellar bone, and no primary osteons. This suggests an age at death of 42 years.

FEATURE 20 (Funerary Urn, Square A-2, Main Cut).—This feature consists of a small urn containing the nearly complete remains of a child and two adult bones. The urn was first exposed in 1972 and then excavated and removed by the author in 1973. The urn extended from a depth of 20 cm below the surface to a depth of 70 cm. Sherds were distributed throughout the urn fill, including within the bone concentration. Skeletal remains were concentrated from a depth of 40 cm to the bottom of the urn. Most of the child skeleton was articulated. Furthermore, positions of the disarticulated bones suggested that they too had been articulated, but had moved out of anatomical position as the flesh decomposed and the skeleton settled (Figure 39). The child would have been on its right side with the legs tightly flexed and the skull SSE of the post-cranial skeleton. A metal ring was found within the urn at a depth of 45 cm, in the northern part of the bone concentration near the skull. The ring could have been in place on the nose and shifted northward as decomposition proceeded.

The urn itself displays a lip beveled interiorly, everted rim, and concave everted neck. There are no appendages and no decorations. Maximum diameter and height are each about 50 cm. Additional artifacts include the metal ring already mentioned and one mano.

Skeletal remains from the urn weigh 450 g and represent a nearly complete child skeleton (Table A64). The mandibular first molars display complete crown formation but only 75 percent root formation. This and other dental formation data suggest an age of 5.5 to 6.0 years.

FIGURE 39.—Articulated subadult bone within feature 20.

Adult bones are represented by only a left cuboid and a single vertebral centrum.

FEATURE 21 (Funerary Urn, Squares A-1, B-1, Main Cut).—This feature consists of a funerary urn with inverted urn covering. Initially exposed in 1972 when the covering was removed, the lower urn was excavated and removed by the author in 1973 (Figure 40). The covering was initially encountered at the surface and contained only sherds and a few shell beads. The upright urn extended from a depth of 16 cm from the surface down to a depth of 1.14 m. The upper portion of the fill within the urn contained a loose dark soil with many sherds and three large *Anadara grandis* shells. The skeletal material was first encountered at a depth of 56 cm and continued to the bottom of the urn (Figure 41). No bone articulation was observed.

FIGURE 40.—Funerary urn, feature 21.

FIGURE 41.—Skeletal concentration within feature 21.

The upright urn displays a lip beveled interiorly, straight parallel neck, round-pointed base, and neither appendages nor decorations. Dimensions are as follows: rim diameter, 45 cm; maximum urn diameter, 69 cm; maximum height, 96 cm; rim thickness, 23–30 mm; body thickness, 11 mm.

The reconstructed covering consists only of the rounded bottom and 45 cm of the sides. Body thickness is 9 mm and maximum diameter is estimated at 55 cm.

Additional artifacts recovered from the feature consist of 35 beads, one metal ring, and one ceramic figurine fragment. The beads represent two type A, 24 type D, seven type F, and two type J.

Skeletal remains from this feature weigh 17,112 g and represent at least 10 adults and 11 subadults (Tables A14 and A65). Innominate morphology suggests at least three males and two females are present. Femoral size indicates four males and four females.

Only one male left pubic symphyseal face is sufficiently intact to allow an age estimate. It displays a complete ventral rampart with some surface deterioration, thus suggesting an age of greater than 40 years. Microscopic examination of femoral sections from nine adults produce the following age estimates: males, 37, 40, 42, 43; females, 26, 27, 40, 49; and undetermined sex, 47. These data are summarized in greater detail in Table 11.

Twenty-one fragments of adult long bones, ribs, and vertebrae are charred. The black color is unevenly distributed over the bone and joint surfaces, which suggests minimal exposure of the bones to a low temperature fire after flesh was gone and the bones were disarticulated.

Dental formation data and bone sizes suggest that of the 11 subadults, nine are between birth

FIGURE 42.—Funerary urn, feature 22.

FIGURE 43.—Skeletal concentration within feature 22.

TABLE 11.—Ages estimated for adults in feature 21 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
21-1	102	11	31	12	27	F
21-2	90	11	8	0	26	F
21-3	101	–	0	0	47	
21-4	94		1	0	43	M
21-5	117	24	3	0	40	M
21-6	114	20	0	0	37	M
21-7	135	32	1	0	49	F
21-8	107	26	0	0	42	M
21-9	87	25	1	0	40	F

and 1.5 years of age, one is between 1.5 and 2.0 years and one is about age three.

FEATURE 22 (Funerary Urn, Square A-1, Main Cut).—This feature consists of a funerary urn with a fragmentary inverted urn covering. The covering was exposed and removed in 1972 and was too incomplete for reconstruction. The upright urn is complete (Figure 42) and extended from near the surface to a depth of 1.12 m. Within the urn, only sherds and soil were encountered from the surface to a depth of 55 cm. The bone concentration (Figure 43) extended from that depth to the bottom of the urn. All bones were disarticulated except for an articulated talus and calcaneus and several vertebrae from the middle of the concentration. Two articulated innomi-

nates were found in the extreme NE of the concentration; however, since the corresponding femora and sacrum were not present, the articulation probably was accidental.

The urn measured about 90 cm in height, 67 cm in diameter, with a rim diameter of about 43 cm. Additional artifacts include a metal ring (Figure 104*f*) and 31 shell beads. Of these, 29 are type D and two are type F.

The human bones weigh 17,956 g and represent at least eight adults and 12 subadults (Tables A15 and A66). Innominate morphology suggests at least three males and one female are present. Morphology of the pubic symphysis indicates both males were about 40 years at death while the female was probably older than 50 years.

Sorting of the femora by size reveals at least 12 subadults represented by that bone. Eight of these measure 64–95 mm, thus representing ages at death of between birth and six months. Two additional individuals have femoral lengths of 96 mm, indicating ages at death of about six months. An additional individual shows a femoral length of 265 mm, suggesting an age at death of 7–8 years. The final subadult is about 15 years of age, as indicated by the nonunion of epiphyses on the head and distal ends of the femora and proximal ends of the tibiae. Cranial morphology suggests female sex for this individual.

FEATURE 23 (Funerary Urn, Squares A-1, A-2, and Western Extension, Main Cut).—This feature consists of a funerary urn with the partial body of another urn extending around its upper portion. The top of this feature was exposed in 1972 and completely excavated and removed in 1973. The covering is very incomplete and does not extend above the rim of the lower urn. Since the top of the urn, however, is only 5 cm below surface level, the covering may once have been a complete inverted urn whose base gradually broke away as the hillside eroded. Field notes report that in 1972 beads were found between the covering and the urn, and one large axe-shaped copper plate was recovered from within the covering.

The urn (Figure 44) extended from 5 cm below surface level to a depth of 95 cm. The urn contained a few sherds, shells, and charred seeds mixed with loose soil down to the bone concentration (Figure 45) at a depth of 48 cm. Some bones extended above the concentration to a depth of 38 cm. All bones were disarticulated except 11 vertebrae (fifth thoracic through the third lumbar) of a young adult.

The urn displays a lip beveled interiorly, interiorly thickened rim, straight everted neck, and round-pointed base. There are no appendages and no decorations. Dimensions are as follows: rim diameter, 45 cm; maximum urn diameter, 65 cm; height, 95 cm.

Only two type I beads were recovered.

Human remains weigh 15,460 g and represent at least seven individuals: three adults and four subadults (Tables A16 and A67). As the tables show, the adults are well represented by nearly all bones. The material is well preserved. Innominate morphology indicates that two females and one male are present. The male pubic symphyseal face displays an incomplete ventral rampart with some vestigial billowing, thus indicating an age between 32 and 35 years. A femoral section from this individual reveals 5 percent lamellar bone remaining, but debris along the periosteal edge prevents an accurate count of secondary osteons or osteon fragments. The lamellar bone suggests an age greater than 25 years and is thus compatible with the estimate from the pubis.

The symphyseal faces of the pubes of both females reveal the irregular pitting and porosity characteristic of advancing age. Both individuals, however, show deep depressions on the dorsal pubic surfaces probably from multiple childbirths. Such extensive pitting could indicate premature deterioration of the symphyseal face. Femoral sections from these two individuals showed the following counts: secondary osteons, 106 and 110; fragments, 19 and 22; lamellar bone, 5 and 1 percent; and no primary osteons. These data suggest ages of 32 and 38 years. Long bone size suggests the youngest subadult died at birth or soon after. Dental evidence suggests ages of 4, 10, and 14 years for the three other subadults.

FIGURE 44.—Funerary urn, feature 23.

FIGURE 45.—Skeletal concentration within feature 23.

Two long bone shaft fragments show evidence of burning. Both are calcined and warped and display transverse fracture patterns, all indicative of cremation in the flesh.

Evidence of extensive rodent gnawing occurs on one fibular shaft fragment.

FEATURE 24 (Funerary Urn, Square A-1 and Western Extension, Main Cut).—This feature consists of a funerary urn covered with several sherds. It was initially identified in 1972 and then completely exposed, excavated, and removed in 1973. The urn (Figure 46) extended from a depth of 23 cm to a depth of 1.13 m. The urn fill from the rim to the bone concentration contained many sherds and three large *Anadara grandis* shells. The human bone concentration extended from a depth of 60 cm to the bottom of the urn. Within the concentration, long bones were stacked up along the southern and eastern borders, and skulls were concentrated on the northwestern side (Figure 47). Three articulated ribs and 18 articulated adult vertebrae were encountered in the center of the concentration at a depth of 70 cm. All vertebrae were present from the fifth lumbar through the seventh cervical. In the extreme bottom of the urn occurred the articulated sacrum, innominates, and bones of the tightly flexed legs and feet of the same adult male. A concentration of infant bones, some articulated, was found at a depth of 75 cm near a concentration of large shell beads. An additional adult tibia and fibula appeared to be articulated at this same level. It seems probable

FIGURE 46.—Funerary urn, feature 24.

FIGURE 47.—Skeletal concentration within feature 24.

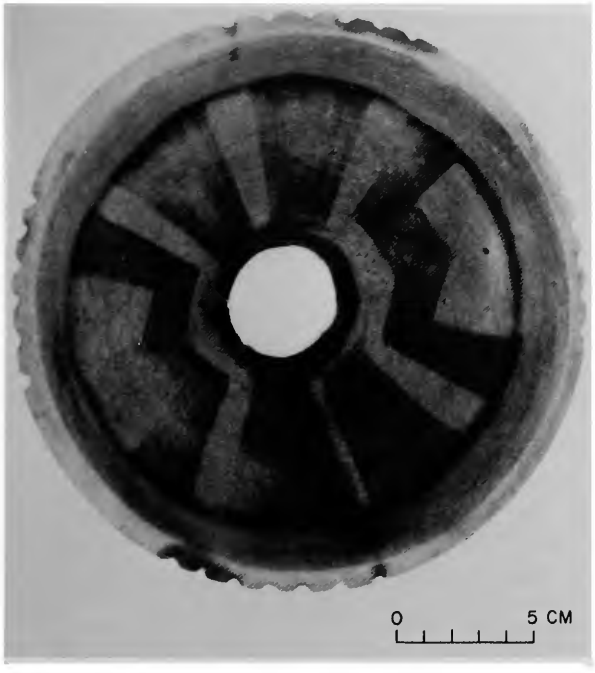

FIGURE 48.—Compotera plate from feature 24.

FIGURE 49.—Ceramic jar from feature 24.

that the adult and infant were completely articulated at the time of burial in the urn. The upper and lower halves of the adult body probably separated as flesh decomposed and bone positions shifted. A compotera plate (visible in Figure 47, upper left) was also found slightly below and NE of the articulated adult vertebrae. A jar was located near the bottom of the concentration.

The urn displays a rounded lip, straight inverted neck, round-pointed base, and no decorations nor appendages. Dimensions are as follows: rim diameter, 40 cm; maximum urn diameter, 55 cm; maximum height, 90 cm; body thickness, 10 mm.

The compotera plate (Figure 48) displays a lip beveled interiorly. The plate's inside surface is smooth, although the outside surface is rough with air pockets. The rim is decorated at four places with groups of indentations. The indentations occur in groups of seven, six, six and five, and each indentation is about 6 mm wide and 4 mm deep. The interior plate surface displays a white decoration, as shown in Figure 48. Dimensions of the plate are maximum diameter, 214 mm; diameter at plate-pedestal junction, 53 mm; height of plate, 54 mm; rim thickness, 4 mm; base thickness, 7 mm.

The jar (Figure 49) displays a rounded lip, everted rim, straight everted neck, rounded, but slightly irregular body, and annular base. There are no appendages and no decorations. The color varies from orange to black-gray, and the texture is very rough with air pockets. Dimensions are as follows: rim diameter, 81 mm; neck diameter, 63 mm; maximum body diameter, 124 mm; base diameter, 61 mm; height, 123 mm; thickness, 6–10 mm.

In addition to the artifacts already mentioned, one ceramic spindle whorl and 90 beads were recovered, consisting of 45 type A, two type B, 21 type D, 10 type E, two type F, three type I, and seven type J.

Human skeletal remains from feature 24 weigh 16,086 g and represent 15 individuals: six adults and nine subadults (Tables A17 and A68). Adult innominate morphology indicates four males and two females are present. One of the males was articulated in the urn. The pubes of this individual display a complete ventral rampart on the left, but incomplete on the right. A femoral section of this individual shows 91 secondary osteons, 21 fragments, 1 percent lamellar bone, and no primary osteons. This suggests an age at death of 37 years.

Sections of the two female femora produce respective counts of the following: secondary osteons, 96 and 77; fragments, 37 and 32; and both sections lack lamellar bone and primary osteons. This suggests ages at death of 44 and 38 respectively.

A fourth section (of one of the male femora) displays 96 secondary osteons, 16 fragments, 10 percent lamellar bone, and no primary osteons, suggesting an age at death of 29 years.

Pubic morphology of what must be the remaining two males indicates ages at death of 30–35 years and greater than 40 years.

Sorting of the subadult remains by long bone size suggests the following ages at death for the nine subadults: five individuals, age birth or soon after; one at about six months; one at one year; and two at two years.

FEATURE 25 (Funerary Urn, Square A-2 and Western Extension, Main Cut).—This feature was located in 1972 but was fully excavated and removed in 1973. It consists of a large funerary urn covered with an inverted urn (Figure 50). The base of the inverted urn was missing and in its place was a collection of large, thick (10–15 mm) sherds. The highest portion of the covering was 15 cm below the surface, although the sherds extended to the surface.

The covering contained a few bones, and many sherds. A dense bone concentration (Figure 51) extended from a depth of 75 cm to the bottom of the urn. No articulation was observed; however, crania were grouped on the eastern side. A complete jar and compotera were found along the northeastern border of the concentration. Numerous small artifacts were found at the extreme bottom of the urn.

The urn measures 60 cm in diameter with a

FIGURE 50.—Urn with inverted urn covering, feature 25.

FIGURE 51.—Skeletal concentration within feature 25.

FIGURE 52.—Ceramic jar from feature 25.

rim diameter of 47 cm and an estimated height of 60 cm. The covering is incomplete, but had a maximum diameter of 53 cm.

The jar (Figure 52) displays a rounded lip, direct rim, concave everted neck, a body with two slight carinations, an annular base, no appendages, and no decoration. Dimensions are as follows: rim diameter, 84 mm; minimum neck diameter, 48 mm; maximum body diameter, 164 mm; maximum base diameter, 83 mm; maximum height, 178 mm; height of lower carination, 65 mm; height of upper carination, 137 mm; rim thickness, 8–9 mm; body thickness, 5–6 mm.

The compotera is complete with a rounded lip, interiorly thickened rim, and a decoration of either incised or black painted lines on the plate's interior surface. Dimensions are as follows: rim diameter, 191 mm; maximum plate diameter, 206 mm; diameter at plate-pedestal junction, 90 mm; base diameter, 121 mm; height, 80 mm; plate and base thickness, 7–8 mm.

Additional artifacts include 10 metal rings, fragments from two metal rings, several frag-

TABLE 12.—Ages (yrs) estimated for subadults in feature 25 from maximum diaphyseal lengths (mm) of the femora

Length	*Age*	*Length*	*Age*
320	10.0	90	0.5
204	3.5	80	0.5
190	3.0	68	newborn
170	2.0	60–70	newborn
170	2.0	60–70	newborn
95	0.5	60–70	newborn
90	0.5		

ments of metal wire, one cone-shaped copper artifact, one long unidentified copper object, one ceramic spindle whorl, and 1554 beads. The beads represent two type A, 1389 type D, 160 type G, and three type F.

Human remains weigh 12,425 g and represent six adults and 13 subadults (Tables A18 and A69). Innominate and femoral morphology suggests three males and three females are present. Pubes from two females show considerable deterioration. Left femoral thin sections were prepared for two females and one male. The male showed counts of 110 secondary osteons, 45 fragments, one percent lamellar bone, and no primary osteons, suggesting an age at death of about 50 years. The two female sections showed counts of 85 and 97 secondary osteons, 26 and 29 fragments, one and 0 percent lamellar bone, and no primary osteons, for estimated ages of 39 and 40 years. The microscopic data and the morphology of the two female pubes indicate ages at death for the three females of 39, 40, and over 45 years.

Femoral lengths and corresponding estimated ages at death are presented for the 13 subadults in Table 12.

FEATURE 26 (Funerary Urn, Squares A-0 and A-1, Main Cut).—This feature consists of a funerary urn with an inverted urn covering, initially exposed in 1972 and later excavated and removed by the author in 1973. The base of the inverted urn extended up to the then-present surface. Much of this base had been broken away and the resulting sherds were located in the immediate vicinity. The upright lower urn (Figure 53) extended down from a depth of 20 cm to 1.3 m. A sleeve of human bone and soil (Figure 54) was located between the outside of the lower urn and the inside of the urn covering. Human bones within this "sleeve" represent at least three adults and two subadults. Some of these bones belong to the individuals who are also represented by bones within the lower urn. A detailed inventory of adult bones from this sleeve is presented in Table A19. Subadult bones consist of one left temporal, two right temporals, one left scapula, two thoracic vertebrae, one right femur, one left femur and one right radius.

Soil within the upright urn above the bone concentration was very loose and dark, apparently having sifted into the urn after burial. The human bone concentration extended from a depth of 46 cm to the bottom of the urn (Figure 55). Bones were very densely packed primarily with adult skulls and long bones on top. The extreme top skull was resting on its right parietal facing SW. Near the bottom of the urn, was the partially articulated skeleton of an adult male (Figure 56). All bones were articulated from the feet through the pelvis and included the last four lumbar vertebrae. The articulated lumbars were attached to the sacrum but not to the first lumbar or any other bones of the upper torso. Four articulated thoracic vertebrae were found isolated on top of the innominates. The pelvis of the articulated male was in the SW corner of the urn with the femora extending NE and the lower legs tightly flexed underneath. An adult skull was lodged in the very bottom of the urn in the rounded base. This skull was resting on its base facing NE.

The urn covering is incomplete but displays a round-pointed base with a maximum diameter of approximately 70 cm.

The upright urn displays a lip beveled interiorly and a short, straight, slightly inverted neck. The urn has a round-pointed base, a maximum diameter of 72 cm, and an estimated height of about 80 cm.

Additional artifacts from this feature consist of one ceramic spindle whorl and 10 shell beads.

FIGURE 53.—Funerary urn, feature 26.

FIGURE 54.—Human bones located between urn and covering, feature 26.

FIGURE 55.—Concentration of human bones within feature 26.

FIGURE 56.—Articulated pelvis and leg bones within feature 26.

The beads were found within the sleeve and consist of six type A, three type B, and one type D.

Human skeletal remains weigh 9192 g and represent at least 12 individuals: nine adults and three subadults (Tables A20 and A70).

Adult cranial morphology indicates that at least three males and three females are present. The fragmentary nature of most of this material does not allow accurate age estimates to be made; however, the vertebrae of the articulated male in

the bottom of the urn displays stage 2 osteophytosis on the lumbar vertebrae and stage 0 and stage 1 on the thoracic vertebrae. This generally suggests an age of 35 to 40 years.

Rodent gnaw marks occur on the following bones found within the sleeve: a distal left humerus, left and right radii, and a left ulna.

The subadult remains represent at least three individuals. The oldest shows a left femur length of 220 mm and a left mandible with the second deciduous molar still present and the first molar with a completely formed crown, but no root formation. This suggests an age at death of about four years. The other two subadult individuals are about the same size and display a maximum radius length of 75 mm and femur length of 95 mm. These data suggest ages at death between birth and six months. One occipital fragment, probably from the oldest child, shows slight charring on part of the bone surface. This suggests minimal exposure to fire after flesh had decomposed from the bone. The child's left femur also shows slight charring on the distal end.

FEATURE 27 (Funerary Urn, Square B-3 and Northern Extension, Main Cut).—This feature consists of a funerary urn with an inverted urn covering. The feature was initially exposed in 1972, at which time much of the cover was removed. In 1973 the author excavated and removed the lower upright urn. The urn covering extended up to the soil surface and had been extensively damaged by the growth of a large root from a nearby tree. The upright urn extended down from a depth of 18 cm to 1.2 m. Human remains were very fragmentary and concentrated from a depth of 90 cm to the very bottom of the urn, although some human remains were found scattered in the fill above from a depth of 25 cm. Large sherds were concentrated in the upper layers of the urn. No bone articulations were noted.

The urn itself displays a flat lip, direct rim, straight everted neck with a round-pointed base. Dimensions are as follows: maximum rim diameter, 54 cm; maximum urn diameter, 84 cm; height, 102 cm; rim thickness, 25 mm; body thickness, 18 mm. No measurements are available on the urn covering, and no other artifacts are noted from this feature.

Human remains weigh 4001 g and represent at least eight individuals: three adults and five subadults (Tables A21 and A71). Fragments of one right humerus, one fibula, one right mandible, one proximal hand phalanx, and one left calcaneus were found within the urn covering; all other bones in Tables A21 and A71 were found within the lower urn. The humerus fragment from within the urn covering shows evidence of rodent gnaw marks.

Morphology of the innominates and femora suggests that at least one male and one female are present. A section of the female right femur shows counts of 90 secondary osteons, no lamellar bone, and no primary osteons. Debris concentrated in the periosteal third of the section prevented counts of osteon fragments from being made. The counts that were made, however, suggest an age of about 41 years. Arthritic involvement of the skeleton of the male and other factors suggest an age of greater than 40 years for that individual.

The oldest of the subadults displays nonunited epiphyses on the distal left and right third and fourth metatarsals, the left third metacarpal, and one first proximal hand phalanx. This suggests an age of 13 to 15 years.

Vertebral size and an estimated femoral length of 240 mm suggest an age of about five years for the next oldest subadult in this feature. The remaining three subadults all show long bone sizes that suggest an age at death of between birth and six months.

One adult left sphenoid fragment shows some charring on part of the surface. This suggests minimal exposure of this bone to a low temperature fire after flesh had decomposed.

FEATURE 28 (Primary Skeleton, Square C-3, Main Cut).—This feature consists of a primary articulated skeleton initially exposed in 1972, at which time all bones above the pelvis were removed. In July 1973 the author re-excavated this skeleton and removed the remaining bones. The skeleton was lying on its back with legs extended. The skull was located WSW of the postcranial material at a depth of about 30 cm. Analysis is complicated by the fact that bones from two

other adults were mixed in with those bones subsequent to their removal in 1972; however, analysis of the bones removed in 1973 indicates the articulated skeleton is that of a female. The femoral section revealed 85 secondary osteons, 29 osteon fragments, one percent lamellar bone, and no primary osteons remaining, suggesting an age estimate of 39 years.

FEATURE 29 (Funerary Urn, Square B-1, Main Cut).—This small urn was excavated and removed in 1972. According to field notes the urn was covered with a concentration of sherds and within the urn a concentration of shell beads occurred near a subadult skull. The urn was located directly above the primary skeleton of feature 42.

This small urn displays a lip with a slight interior bevel, a concave everted neck, rounded base, and no appendages nor decorations. Dimensions are as follows: rim diameter, 26 cm; maximum urn diameter, 37 cm; height, 37 cm; rim thickness, 7–11 mm; body thickness, 5–10 mm.

Human remains weigh 178 g and consist of several bones from an infant, one adult rib, one adult foot navicular, and one adult permanent maxillary central incisor. The following bones of the infant are present: the left humerus, the right radius, both ulnae, both femora, the right scapula, both temporals, both ischia, the right pubis, nine ribs, and 14 vertebrae fragments.

Within the maxilla, the left permanent first molar shows a crown 50 percent complete and a right central incisor has a crown 50 percent complete. This and a right femoral length of 92 mm suggest an age at death of about one year.

The beads recovered consist of one type E and 130 type J.

FEATURE 30 (Funerary Urn, Square A-0, Main Cut).—This feature was first recognized and partially isolated in 1972, but was excavated in detail and removed by the author in 1973. It consists of a large funerary urn covered with an inverted urn (Figure 57). The inverted urn extended from a depth of 32 cm to 89 cm, the upright urn from a depth of 68 cm to 1.5 m. The urn covering and the upper 15 cm of the lower urn contained no soil or bone; however, a "sleeve" of loose soil and disarticulated human bones did occur around the exterior of the lower urn, inside the covering (Figure 58). The sleeve contained bones of three adults and two subadults, all of whom are also represented by bones from the lower urn. Detailed inventories of adult and subadult bones in this sleeve are presented in Tables A22 and A72. Within the sleeve and immediately below the bones was a concentration of shells, contiguous with a layer of compact shell in the site stratigraphy. Although pit outlines above the urn had been destroyed by the 1972 excavation, at depths below 50 cm the original pit for this feature was only slightly larger than the diameter of the urn itself. Thus it is doubtful that the bones in the sleeve could have been deposited after the covering was in place. Also, since several long bones were leaning against the covering, it is doubtful that the bones were in place before the covering was added. The most logical interpretation seems to be that the bones found in the sleeve were brought to the feature in the urn covering. As the covering was quickly inverted and placed over the rim of the upright urn, some of the bones fell between the walls of the two vessels.

The bone concentration (Figure 59) within the upright urn began at a depth of 90 cm and extended to the bottom. The bones were covered with from 5 to 20 cm of fine soil that had apparently sifted down through cracks in the covering. All bones were disarticulated with three exceptions. At a depth of 93 cm along the western edge of the concentration occurred four articulated adolescent lumbar vertebrae and an articulated adult female left femur and innominate. At the same level, in the center of the concentration, were the adolescent's articulated metatarsals, left femur, and left innominate. Articulated infant bones were found 30 cm from the bottom on the west side. A radius, ulna, and several vertebrae were definitely articulated, and many other bones were concentrated in the area.

The upper portion of the bone concentration contained mostly long bones and skulls. Skulls A through G are labeled in Figure 59. Table 13 describes the location and position of crania within the concentration.

One complete ceramic jar, one compotera, and one metal ring were found within the bone con-

FIGURE 57.—Funerary urn with inverted urn covering, feature 30.

FIGURE 58.—Disarticulated bones located between urn and covering, feature 30.

FIGURE 59.—Concentration of human bones, feature 30.

TABLE 13.—Depth (cm) and position of crania within feature 30

Skull	*Depth*	*Direction facing*
A	77	SE
B	80	SE
C	82	SE
D	88	N
E	89	SW
F	93	E
G	99	SE
H	95	SW

centration, but not in obvious association with any particular bone. Additional small artifacts were found concentrated in the base of the urn.

The urn covering (as excavated and reconstructed) is incomplete, consisting only of the bottom and sides. The covering displays a round-pointed base, body thickness of 17 mm, and a maximum diameter of 67 cm. The height of the existing covering is about 55 cm.

The reconstructed urn from this feature displays a flat lip, everted rim, straight everted neck, with a round-pointed base. Dimensions are as follows: rim diameter, 48 cm; maximum urn diameter, 68 cm; height, about 82 cm; rim thickness, 20 mm.The complete jar (Figure 60) found within the bone concentration displays a rounded lip, everted rim, straight everted neck, a very symmetrical oval-shaped body, a slight carination in the middle of the body, and a rounded base. There are no appendages, and decoration is confined to one incised line extending around the circumference of the rim and a double line of round punctations extending around the neck. The overall texture is smooth with a rough base. The color is orange to black, but mostly brown-orange. The lower 32 mm of the outer surface appears quite rough with horizontal striations. The outside surface above that point is smooth with vertical striations. Dimensions are as follows: maximum rim diameter, 113 mm; minimum neck diameter, 53 mm; maximum body diameter, 133 mm; maximum height, 165 mm; rim thickness, 6–7 mm; body thickness, 5–6 mm.

FIGURE 60.—Ceramic jar from feature 30.

The compotera found within the bone concentration consists only of the plate, which displays a lip beveled interiorly and a concave everted rim. A carination occurs 20 mm below the lip and the vessel has a convex bottom. The texture is smooth on the entire inside surface of the plate and outside above the carination; but the surface is rough below the carination. The color is dark orange with black and gray areas on the inside; the outside color is the same with more gray. Dimensions are as follows: rim diameter, 141 mm; diameter at carination, 130 mm; plate thickness, 6–7 mm.

Six hundred and four shell beads were recovered from the feature. Of these, 352 are type D, 244 are type G, and eight are type F.

Additional artifacts recovered include one ceramic spindle whorl, one ceramic disk, two metal rings, and four groups of small triangular copper plates. One of these groups appears to contain between 15 and 20 plates; the other three groups about 10. The copper is extremely eroded, and each plate measures about 18 mm in height and 16 mm in width at the base.

Human remains from this feature weigh 17,031 g and represent at least 13 individuals: five adults and eight subadults (Tables A23 and A73).

Morphology of the femora and innominates suggest that two males and three females are present.

Microscopic sections taken from the femora of the five adults suggest ages of 23 years (one male),

35 (one male and two females), and 39 (one female). These data are presented in detail in Table 14. Morphology of the pubic symphyseal face of the articulated adult individual suggests that it probably corresponds to the oldest age indicated by the section data.

Ages at death of the subadults were estimated by sorting the subadult remains by size and estimating ages from the degree of dental formation. This procedure reveals that at least eight subadults are present from the entire feature of the following ages: two of 12 years, one of 10 years, two of three years, one of six months, one of four to six months, and one at birth or soon after.

FEATURE 31 (Funerary Urn, Squares A-1 and A-2, Main Cut).—This feature was initially exposed in 1972 but excavated in detail and removed in 1973. It consists of a funerary urn with no covering (Figure 61). The urn extended from a depth of 38 cm down to 1.17 m. Within the urn were numerous sherds, one complete vessel, one compotera, but very little human bone. Human bone fragments were scattered throughout the urn fill, but there was no concentration of human bones.

The urn measures 79 cm in diameter and 79 cm in height. The rim is not present and the base consists of a rounded point.

The jar displays a tapered lip, everted rim, concave everted neck, a rounded oval body with two carinations, and a rounded base. There are no appendages, and decoration consists of two lines of punctations extending around the neck.

TABLE 14.—Ages estimated for adults in feature 30 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average %-lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
30-1	64	32	0	0	35	F
30-2	74	16	0	0	35	F
30-3	52	–	18	3	23	M
30-4	72	20	1	0	35	M
30-5	82	59	1	0	39	F

FIGURE 61.—Funerary urn, feature 31.

The parallel lines are 4 mm apart and the punctations are approximately 3 mm in diameter and 3 mm apart. The texture is smooth with a red slip extending down from the rim 9 mm on the inside and 119 mm on the outside. The color is brown-orange with some gray areas. The surface shows perpendicular striations between the neck and first carination and horizontal striations below the first carination. Dimensions are as follows: maximum rim diameter, 77 mm; minimum neck diameter, 31 mm; diameter at first carination, 67 mm; diameter at second carination, 92 mm; maximum height, 132 mm; rim thickness, 4–5 mm.

The compotera consists only of the plate portion, which displays a lip beveled interiorly, a concave everted rim, and a carination 24 mm below the lip. There are no appendages and no decorations. All surfaces are smooth with a red slip present; the color is red-orange with some black areas. Horizontal polishing striations occur on the exterior and interior rim. Vertical striations occur on the outside surface below the carination. All striations are parallel. Dimensions are

as follows: maximum rim diameter, 221 mm; diameter at carination, 208 mm; diameter at plate-pedestal junction, 65 mm; height of plate, 55 mm; plate thickness, 6 mm.

Additional artifacts from this urn consist of one metal ring, one fragment from a copper tweezers, and one small fragment of obsidian.

Human remains from this feature weigh 63 g and represent at least four individuals (two adults and two infants). All of the remains are very fragmentary and incomplete. The adult remains are as follows: one hyoid, one proximal 2-5 hand phalanx, two medial hand phalanges, four distal hand phalanges, one left and one right lunate, one right hand navicular, one right capitate, two left greater multangulars, one left lesser multangular, one left triquetral, one first proximal foot phalanx, four proximal 2-5 foot phalanges, one maxillary left adult canine, one maxillary right central incisor, and one maxillary left third molar.

The small size of the foot bones suggests female sex. The canine and the incisor teeth are worn to expose secondary dentin, while the third molar shows only slight wear. This generally suggests an age of 22 to 27 years. Note that the presence of a second adult is assured only by there being two left greater multangulars.

The subadult remains consist of the following bones: one right tibia shaft, one left femur, four neural arches of thoracic vertebrae, two centra of thoracic vertebrae, three sphenoid fragments, one rib, one proximal hand phalanx with the proximal epiphysis not united, one right fifth metacarpal with the distal epiphysis not united, one middle hand phalanx, and one deciduous right maxillary incisor showing slight attrition. The degree of dental attrition as well as the size of the bones suggests an age at death of two to three years.

A younger infant is represented by the following bones: one right clavicle, one rib, and one left neural arch from a thoracic vertebra. The size of these bones suggests the infant died at birth or soon after.

FEATURE 32 (Primary Skeleton, Squares C-0, D-0, and D-1, Main Cut).—This skeleton was partially excavated and then again covered with soil in January 1973. Later in 1973, I completely exposed and removed the skeleton. The skeleton was lying on its back with the skull SW of the postcranial skeleton. Both arms and legs were extended. Dimensions of the skeleton in situ were: maximum length, 1.47 m, maximum width, 38 cm. Three single metal rings were in each ear region. In addition a shell (*Protothaca asperrima*) was located within each eye orbit; however, the skeleton was lying within the shell layer and thus the shell locations may have been accidental. The skull of this individual is 65 cm below the surface.

Due to the previous exposure, many of the bones are fragmentary and poorly preserved. The small size of the bones and morphology of the innominates suggest female sex. Microscopic examination of a section from the left femur reveals 105 secondary osteons, 46 osteon fragments, no lamellar bone, and no primary osteons remaining. This suggests an age of about 49 years, which is compatible with the presence of considerable arthritic involvement on the skeleton, fusion of the majority of the cranial sutures, and loss of teeth in the mandible.

FEATURE 33A–C (Isolated Skull, Ceramic Concentration and Primary Skeleton, Squares E-1, E-2, and Eastern Extension, Main Cut).—This feature consists of a complex of sherds, shells, and ash located above an isolated skull and an articulated skeleton. Most of this feature was defined in 1972. Only the extended skeleton was excavated by the author. This feature number was initially assigned to a large concentration of sherds that extended from the E-1–E-2 border across E-1 for 2.8 m to the E. The sherds represent both large (urn-size) and small vessels and were mixed with ash, shell, and some charred faunal remains. Two distinct fire pits were noted: one about 80 cm in diameter in E-2 and the other one 50 cm in diameter 2.1 m E of E-2. The area between and around these pits was concentrated with sherds and shells from the ground surface to a depth of about 45 cm. The larger fire pit extended from a depth of 35 cm to 80 cm.

An isolated skull was found and removed in

January 1973. It was designated 33A and was found within E-1 at a depth of 70 cm. According to field notes, sherds and a metate were found nearby, although pit outlines were not distinguished. The skull is very fragmentary and displays open sutures, slight attrition on the molars and premolars, with dentin exposed on the canine. This suggests an age at death of 25–30 years. Sex cannot be estimated reliably.

The designation 33B was loosely assigned to the sherd, shell, and ash complex described above. The large quantity of ceramics and the fire pits probably represent intrusion into a pre-existing urn burial. The intrusion may have been made through activity connected with the cemetery use or it may have been recent.

Feature 33C refers to an articulated primary skeleton (Figure 62) located in squares E-1, E-2, and Eastern Extension just S of and below 33A and 33B. The skeleton was lying on its back with legs and arms extended. The skull was located WSW of the postcranial material. The skeleton measured 1.75 m in length; 28 cm in width; with the skull at a depth of 1.10 m. A ceramic vessel was located immediately S of the skull and a plate containing the articulated skull and mandibles of a *Lama* was located just N of the skull. Copper plates were found below the left hand on top of the left femoral neck, below the right hand on top of the right femoral neck, below the center of both feet within a small shell, and below the left middle thorax region. One small metal ring was found in place just below the nasal cavity. Several small shell beads were found beneath the fifth thoracic vertebra.

Close examination of the vertical face of the excavation just above the innominates of 33C revealed a pit outline tapering to the north, just N of the articulated skeleton 33C. It is probable that this outline marked the southern limit of the concentration designated 33A and 33B. The articulated skeleton itself was relatively complete. The large size of the bones and morphology of the pelvis suggest male sex. Incomplete ventral ramparts on the pubic symphyseal faces suggest an age at death between 30 and 35 years. The vertebrae and long bone joint surfaces show minimal arthritic change and the coronal, sagittal, and lambdoidal cranial sutures are all open.

The ceramic jar is complete and displays a rounded lip, exteriorly thickened rim, concave everted neck, and flat base. There are no appendages nor decorations. Dimensions are as follows: rim diameter, 83 mm; vessel diameter, 156 mm; height, 180 mm; body thickness, 3–4 mm.

The compotera consists only of the plate, which displays a lip beveled interiorly and a concave everted rim with a maximum diameter of 105 mm. A red slip occurs on the inside surface of the plate.

Thirty-seven shell beads were found associated with this feature: eight type D and 29 type F.

The copper plates are very fragmentary and eroded but are approximately 15 mm in height and 17 mm in width at the base. Each group contains at least two plates.

FEATURE 34 (Funerary Urn, Square C-2, Main Cut).—This feature was located and partially excavated in 1972. Field notes reference an urn covering at a depth of 60 cm. Excavation in 1973 by the author revealed that the upper portion of the funerary urn apparently had collapsed, giving the impression of an urn covering. Although the entire urn was not present; many of the sherds from the upper portion were found within the lower portion. A concentration of human bones was found at a depth of 76 cm. The bones were concentrated in the bottom of the urn along the N side. No bone articulations were noted; however, a line of shell beads was found extending between a femur and the east wall of the urn. Some bones extended all the way to the bottom of the urn at a depth of 1 m.

Of the total of 590 beads, 550 are type D, 21 are type F, one is type G, and 18 are type L.

Human remains weigh 1781 g and represent at least one adult and one infant (Tables A24 and A74).

The morphology of the adult innominate indicates female sex. A section taken from the left adult femur shows 87 secondary osteons, 37 fragments, no lamellar bone, and no primary osteons.

FIGURE 62.—Primary skeleton, feature 33C.

FIGURE 63.—Concentration of secondary infant bones near articulated female left femur and innominate, feature 35.

FIGURE 64.—Right hand and articulated right femur and innominate of adult female, feature 35.

This suggests an age at death of about 41 years. The adult skull shows endocranial fusion of the coronal and sagittal sutures, but these sutures have not fused ectocranially. The lambdoidal suture is open both inside and out. All teeth have been lost ante-mortem except the maxillary right second premolar and one right molar.

The size of the infant bones suggests the individual died at birth or soon after.

FEATURE 35 (Partially Disturbed Primary Skeleton, Squares B-2 and C-2, Main Cut).—This feature consists of the articulated innominates, femora, and hands of an adult female and the mostly secondary remains of at least two subadults (Figures 63 and 64). The bones were first encountered at a depth of 71 cm and were mostly concentrated in an area 50 cm long E–W and 27 cm wide N–S. The positions of the adult bones suggest that they represent the remains of a once complete primary skeleton that was disturbed at some period after burial. The position of the bones indicate the skeleton was lying on its stomach and right side with arms and at least upper legs extended. The skull would have been WSW of the postcranial skeleton. The subadult remains were all concentrated immediately S of the articulated left femur in an area 37 cm by 17 cm, and 15 cm thick. One subadult mandible was articulated with the skull. All other subadult remains did not appear to be articulated. The only associated artifacts consist of several sherds scattered over the area.

It is probable that this feature was disturbed when the pits for features 2 and 3 were dug. The pit of feature 2 intersected feature 35 just above the pelvis while the pit for feature 3 intersected just below the knee.

Morphology of the adult pelvis and femora indicates female sex. A section of the left femur reveals 96 secondary osteons, 52 fragments, no lamellae, and no primary osteons. This suggests an age at death of 44 years.

The subadult remains contain most of the major bones of two individuals (Table A75). The larger of the infants displays a stage of dental formation suggesting an age at death of nine months to one year. The smaller of the two individuals died at birth or soon after, judging from the size of the long bones.

FEATURE 36 (Primary Skeleton, Square C-3, Main Cut).—This feature consists of a child (Figure 65) lying on its stomach and right side in extended position, with the remains of two infants located immediately above the left ilium, just S of the left hand and left upper femur. The adolescent skull was SW of the postcranial remains at a depth of 69 cm. A complete ceramic vessel was resting on a plate and the plate portion of a compotera just W of the skull.

The pit outline for this feature intersected the pit outline for nearby feature 43, which contained an extended primary adult skeleton in the same orientation (Figure 75).

The extended subadult displays a stage of dental formation that suggests an age at death of 8–9 years. No estimate of sex is possible. The secondary associated infant bones represent at least two individuals (Table A76). Long bones size indicates that one of these two individuals died at age 6 months to 1 year and the other at birth or shortly after.

The ceramic jar is complete (Figure 66) and displays a rounded lip, everted rim, concave everted neck, an oval-shaped body slightly carinated, and a rounded base. There are no appendages, and decoration is confined to a single line of punctations extending around the neck. Each punctation is about 5 mm in diameter and about 5 mm from the next. The texture is smooth with a red slip extending down from the rim 37 mm on the inside and 208 mm on the outside. Vertical striations occur over all of the outside surface. Dimensions are as follows: maximum rim diameter, 171 mm; minimum neck diameter, 79 mm; body diameter, 202 mm; vessel height, 243 mm; height of body to neck junction, 163 mm; height of carination, 99 mm; rim thickness, 6–7 mm.

The ceramic plate is nearly complete and displays a rounded lip, straight everted rim, and a flat base. Appendages consist of four additions to the rim, uniformly spaced around the rim. There are no decorations, but the inside surface is polished with a slip present, and the outside surface is somewhat rough. The plate is 215 mm in diameter and 37 mm in height.

The compotera consists of only the plate (Figure 67), which displays a lip beveled interiorly and a slightly concave everted rim. A carination occurs 17 mm from the lip. There are no appendages, no decorations and no slip. The surface shows irregular smoothing striations on the interior but none on the exterior. Dimensions are as follows: maximum rim diameter, 121 mm; diameter at carination, 109 mm; diameter at plate-pedestal junction, 34 mm; height of plate, 30 mm; thickness, 7–12 mm.

FEATURE 37A–E (Ceramic Concentration Covering Primary and Secondary Human Remains, Square E-3 and Eastern Extension, Main Cut).—This feature consists of a large concentration of sherds covering individual concentrations of human remains. The entire feature was excavated in July 1973. The pottery consisted of large thick (urn size) sherds, concentrated in an area about 2 m long and about 1.2 m wide (Figure 68). The long axis of the concentration extended NE–SW, and was mostly located in the center of Square E-3 but stretched slightly into the eastern extension. Most of this concentration occurred between depths of 30 and 80 cm. Below the ceramic concentration were five individual concentrations of human remains. The concentrations of human remains labeled A, B, D, and E contained only secondary remains, while concentration C con-

FIGURE 65.—Primary skeleton with associated artifacts, feature 36.

FIGURE 66.—Ceramic jar from feature 36.

FIGURE 67.—Compotera plate from feature 36.

sisted of an articulated primary skeleton. The overall relationship of these concentrations is shown in Figure 69. Note the two ash concentrations in line with skeletal concentrations B and C. These ash deposits represent pits extending down from the level of the pottery concentration.

A: This consists of a tightly packed assemblage of human remains with the skull generally located WSW of the postcranial bones. The concentration occurred at a depth of 57 cm and had

a maximum length of 57 cm NE–SW, and a width of 9 cm NW–SE. A metal ring was found within the center of this concentration.

The concentration contained the generally complete remains of one adult (Table A25). Morphology of the innominates, skull, and long bones suggests female sex. An age at death of 20–25 years is suggested by slight molar wear, no cranial suture closure, and no arthritic change on either the vertebral or long bone joint surfaces.

In addition to the adult remains, the concentration contained one mandibular deciduous first molar with the crown only 50 percent formed. The tooth was from an infant who died at birth or soon after.

Four fragments of adult-sized cremated bone are also present. The bone is calcined, warped, and probably represents burning of the bone with the flesh still attached.

B: This concentration was not as tightly packed as that in A. The skull was located NW of the postcranial material in a concentration that measured 43 cm N–S and 27 cm E–W. Depth was 57 cm. The concentration contained the secondary remains of two subadults (Table A77), one 57 mm charred fragment from an adult radius shaft, and one charred adult cranial fragment. All of the subadult bones are from one individual, except one left temporal. The temporal displays a tympanic plate incompletely formed, indicating an age of six months to one year. The other subadult displays a maxillary permanent premolar with a crown 50 percent formed. A mandibular first molar shows a complete crown with initial root formation. A second molar shows a crown 50 percent formed. These data suggest an age at death of about four years.

In addition to the charred adult remains, six of the subadult remains show evidence of burning. Two ribs and two long bone shaft fragments are calcined, white in color, and display the warping and transverse fractures characteristic of burning in the flesh. An additional ulna fragment shows similar warping and transverse fractures, but is gray-black in color. The distal end of the right clavicle is charred.

C: This articulated extended skeleton was lying on its back and right side with the skull WSW of the postcranial skeleton. This skeleton was deeper than the other four concentrations, with a depth to the skull of 70 cm. Measurements of the skeleton were 1.46 m NE–SW and 32 cm NW–SE. Four packets of small triangular copper plates were found associated with this skeleton: above the left foot (5 plates), above the right innominate (at least 11 plates), below the skull (eight to 10 plates), and below the sacrum (5 plates). One ceramic spindle whorl occurred with the copper plates above the left foot. An infant skull and several other infant bones were found between the femora in the pubic area. A concentration of ash about 30 cm in diameter occurred just north of the left shoulder area. The left femur shows evidence of being burned while in situ.

Narrow sciatic notches, pronounced brow ridges, and large mastoid processes on the skull indicate male sex, although femoral head diameters (42 mm) are small.

All cranial sutures are open, and the first and second molars display considerable wear. This suggests an age at death of between 30 and 35 years.

Subadult remains are summarized in Table A78. The bones probably all represent one individual. The maxillary deciduous left lateral incisor shows a completely formed crown, but no root formation. The maxillary deciduous first molar crown is only 75 percent complete. This suggests the infant died at birth or soon after.

Additional artifacts recovered from this feature include one obsidian fragment and nine type D shell beads.

D–E: Letter designations D–E were assigned to what appeared to be two crania within a skeletal concentration 50 cm SE of the skull of 37C. Actually both letters relate to a single secondary concentration containing at least three adults and three subadults. The concentration extended 90 cm NE–SW and 12 cm NW–SE at a depth of 57 cm and was not covered by the ceramic concentration. No bones were articulated; however, the infant bones were concen-

FIGURE 68.—Concentration of pottery, feature 37.

trated within the SW aspect, while the adult crania were found on the NE side.

Two groups of copper plates were found: one below the infant remains in the SW corner and a second group in the lower central part of the concentration. The two groups contained at least 10 to 12 plates, but an exact count is not possible due to advanced deterioration of the specimens.

The skeletal material contained at least three adults and three subadults (Tables A26 and A79). The skull labeled 37-E displays the small supraorbital ridges and mastoid processes characteristic of females. All sutures are open, suggesting a relatively young age at death. The skull labeled 37-D is too fragmentary to allow a sex estimate. Some fragments show open sutures which generally suggest an age younger than 40 years.

A third skull found below D–E represents a male with large mastoid processes and supraorbital ridges. All sutures on the vault are open and the third molars are incompletely formed and erupted. This suggests an age at death of 16–20 years.

Of the three subadults, two died at birth or soon after, as indicated by femoral lengths of 65 mm and 85 mm. The third subadult displays a maxillary permanent first molar with complete crown and slight root formation. This suggests an age of 3–4 years.

In total, feature 37 contains at least five adults and five subadults (Tables A27 and A80). No bones of any one concentration came from individuals who were represented by bones in a different concentration. An extra left temporal was

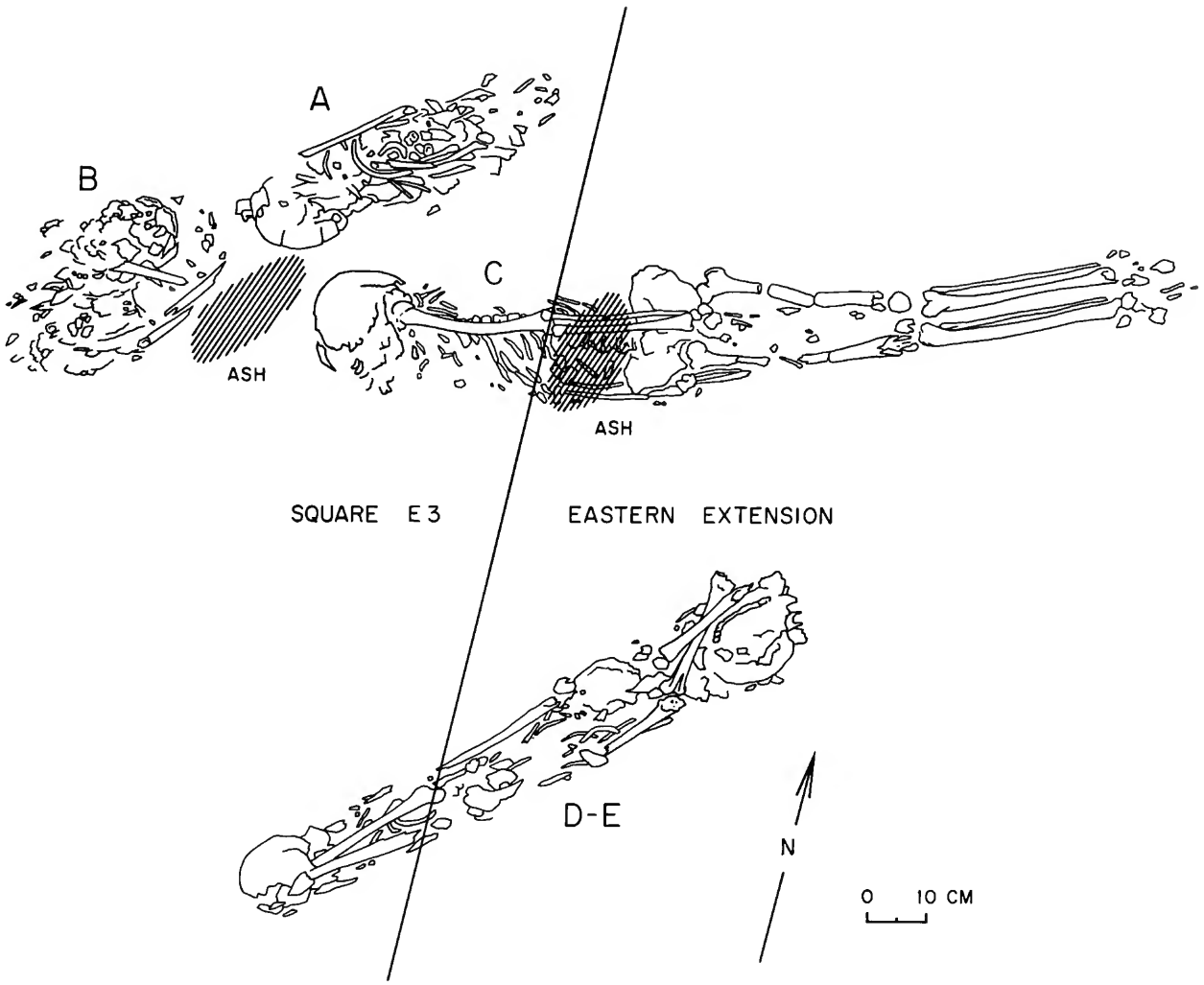

FIGURE 69.—Skeletal deposits within feature 37.

found with 37B that could match with one of the younger infants in D–E; however, this match is not positive.

FEATURE 38 (Primary Skeleton, Square E-3, Main Cut).—This primary skeleton was found late in the field season and was not completely uncovered or removed. The skull was SW of the postcranial material. A compotera plate was found immediately W of the skull. Due to the incomplete excavation no additional information is available on skeleton position.

Only the compotera plate was removed for additional analysis. The plate displays a flat lip, straight everted rim, with a carination 18 mm below the lip. There are no appendages, and decoration is confined to two incised lines extending around the circumference of the plate on the inner rim. The texture is coarse with no slip. There are smoothing striations extending horizontally around the rim on both the inside and outside surfaces. Dimensions are as follows: maximum rim diameter, 183 mm; diameter at carination, 172 mm; diameter at plate-pedestal junction, 55 mm; plate height, 47 mm.

FEATURE 39 (Incomplete Remains of an Articulated Skeleton, Square C-0, Main Cut).—This

feature consists of an isolated articulated right arm (humerus, radius, ulna, and right hand) found at a depth of 74 cm in square C-0. The position of the bones suggests they are from an individual probably lying on its back with arms extended, palms facing down. One isolated adult fibula occurred 33 cm E of the hand. The distal end of the fibula was removed during excavation in 1972. It cannot be judged if the foot was articulated. No artifacts were associated and the distance from the proximal end of the humerus to the distal end of the fibula was 1.30 m. The bones probably represent an articulated skeleton that was partially disturbed when the pit for feature 12 was dug. The skeleton would have been on its back with its skull W of the postcranial skeleton.

A 39 mm head diameter of the humerus strongly suggests female sex. Initial arthritic involvement on the humerus head, the proximal ulna, and the distal radius generally suggests an age at death of 30 to 40 years.

FEATURE 40 (Primary Skeleton, Square C-0 and Southern Extension, Main Cut).—This feature represents an extended adult male lying just NE of the base of the urn in feature 14 and below and NW of feature 19. The feature had been initially located in 1972, but was excavated in detail and removed in 1973. The skull was nearly in contact with the base of feature 14 (Figure 70). Both this feature and the base of feature 14 were lying within the shell layer. The skeleton was lying on its right side with legs extended. The skull was at a depth of 80 cm and was SW of the postcranial remains. Maximum length of the feature was 1.40 m and width was 30 cm. A small badly fragmented pottery vessel was located immediately behind (NW) the skull. No other artifacts were recovered.

Pelvic and cranial morphology suggest male sex. Data on cranial suture closure, vertebral osteophytosis, and pubic symphysis morphology suggest an age at death of between 40 and 50 years.

FEATURE 41 (Primary Skeleton, Square A-3, Main Cut).—This feature represents an articulated infant lying on its stomach and right side (Figure 71). The skeleton was located at a depth of 77 cm within the shell layer. Legs and arms were extended, with the skull WSW of the postcranial skeleton. Two strands of shell beads encircle the infant's pelvis. A total of 234 beads were recovered, 195 type D, 38 type F, and one type G. A small ceramic vessel, found just above the skull, displays a rounded lip, everted rim, concave everted neck, a carination on the body, and a rounded base (Figure 72). There are no appendages, and decoration consists of a single line of 2 mm punctations that extends around the circumference of the vessel at the base of the neck. The texture is smooth with no striations and dimensions are as follows: maximum rim diameter, 93 mm; minimum neck diameter, 47 mm; maximum body diameter, 114 mm; maximum vessel height, 125 mm; rim thickness, 6–7 mm; body thickness, 5–6 mm.

The infant skeleton is generally complete, with major missing bones being confined to the left tibia and both fibulae. An age at death of nine months to one year is suggested by the stage of dental formation: specifically, the mandibular deciduous second molars show crowns complete with no root formation and the mandibular right permanent first molar shows a crown 25 percent complete. In addition to the bones of this individual, a right scapula from an even younger infant and fragments of an adult maxilla and an adult right mandibular condyle were found. The adult maxilla shows some charring.

FEATURE 42 (Primary Skeleton, Square B-1, Main Cut).—This feature consists of a primary adult female skeleton lying on its back and right side with legs and arms extended (Figure 73). The skeleton was directly below feature 29 at a depth to the skull of 88 cm. The skull was located WSW of the postcranial remains. The feature was initially discovered in early 1973 but later excavated and removed by the author. A small ceramic vessel occurred slightly SW and above the skull. Immediately N of the vessel was the skull and mandible of a *Lama* sp. A small shell was found within the left eye orbit. Eight cm above

FIGURE 70.—Primary skeleton of feature 40 and feature 14.

the right hand occurred disarticulated bones from the partial skeleton of a small mammal, *Canis* sp. A concentration of infant bones was found between the adult legs and slightly above the right femur. Four groups of small triangular copper plates were found associated with the skeleton. Two of these (containing at least 18 and 20 plates) were immediately S of the fourth lumbar vertebra. One (about 10 plates) was resting on top of the right fifth middle hand phalanx. The

FIGURE 71.—Primary infant skeleton, feature 41 (skull removed prior to photograph).

fourth group (at least 19 plates) was found just above the proximal end of the left femur beneath the left hand. Two metal rings occurred just below the right mastoid process. An additional ring was found within the right eye orbit. The maximum length of the skeleton was 1.53 m and the width was 26 cm. Pit outlines were distinguished around the skeleton and measured 1.73 m in length by 32 cm in width.

The ceramic vessel (Figure 74) is complete and displays a rounded lip, everted rim, concave everted neck, a carinated oval-shaped body with a rounded base. There are no appendages, and decoration is confined to a single line of punctations extending around the base of the neck. A red slip occurs over most of the outside surface. Dimensions are as follows: rim diameter, 174 mm; neck diameter, 79 mm; diameter at carination, 186 mm; maximum height, 223 mm; height to neck, 138 mm; height to carination, 85 mm; rim thickness, 6–8 mm.

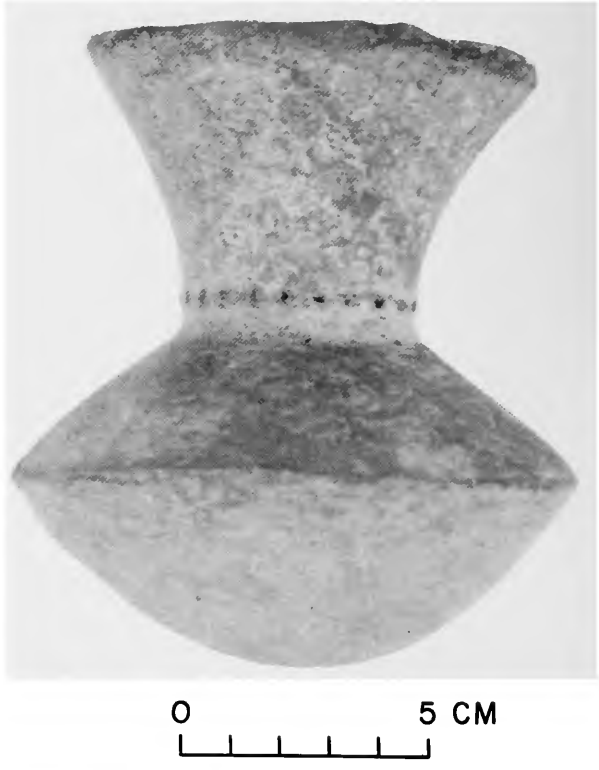

FIGURE 72.—Ceramic jar from feature 41.

FIGURE 73.—Primary skeleton, feature 42.

FIGURE 74.—Ceramic jar from feature 42.

Eleven type D beads were recovered from this feature.

The adult skeleton is complete except for most of the bones of the feet which apparently had been removed in the initial exposure of the skeleton in early 1973. Innominate morphology suggests female sex. The third molars have erupted, yet cranial sutures are open both endocranially and ectocranially and the basilar synchondrosis has not yet united. This suggests an age of between 20 and 25 years.

The subadult remains consist of both humeri, both ulnae, both femora, both tibiae, both temporals, the mandible, both ilia, the right ischium, 16 ribs, and eight vertebrae. The size of the bones suggests an age at death of birth or soon after.

FEATURE 43 (Primary Skeleton, Square C-3, Main Cut).—This feature consists of an extended adult male lying on its right side and back with the skull WSW of the postcranial material (Figure 75). This feature was excavated and removed in 1973. The pit outline was clearly visible around the skeleton. The pit fill was loose and powdery in marked contrast to the clay and shell in the adjacent soil. Maximum depth from the surface to the skull was 74 cm. Maximum length of the skeleton was 1.62 and width, 32 cm. Dimensions

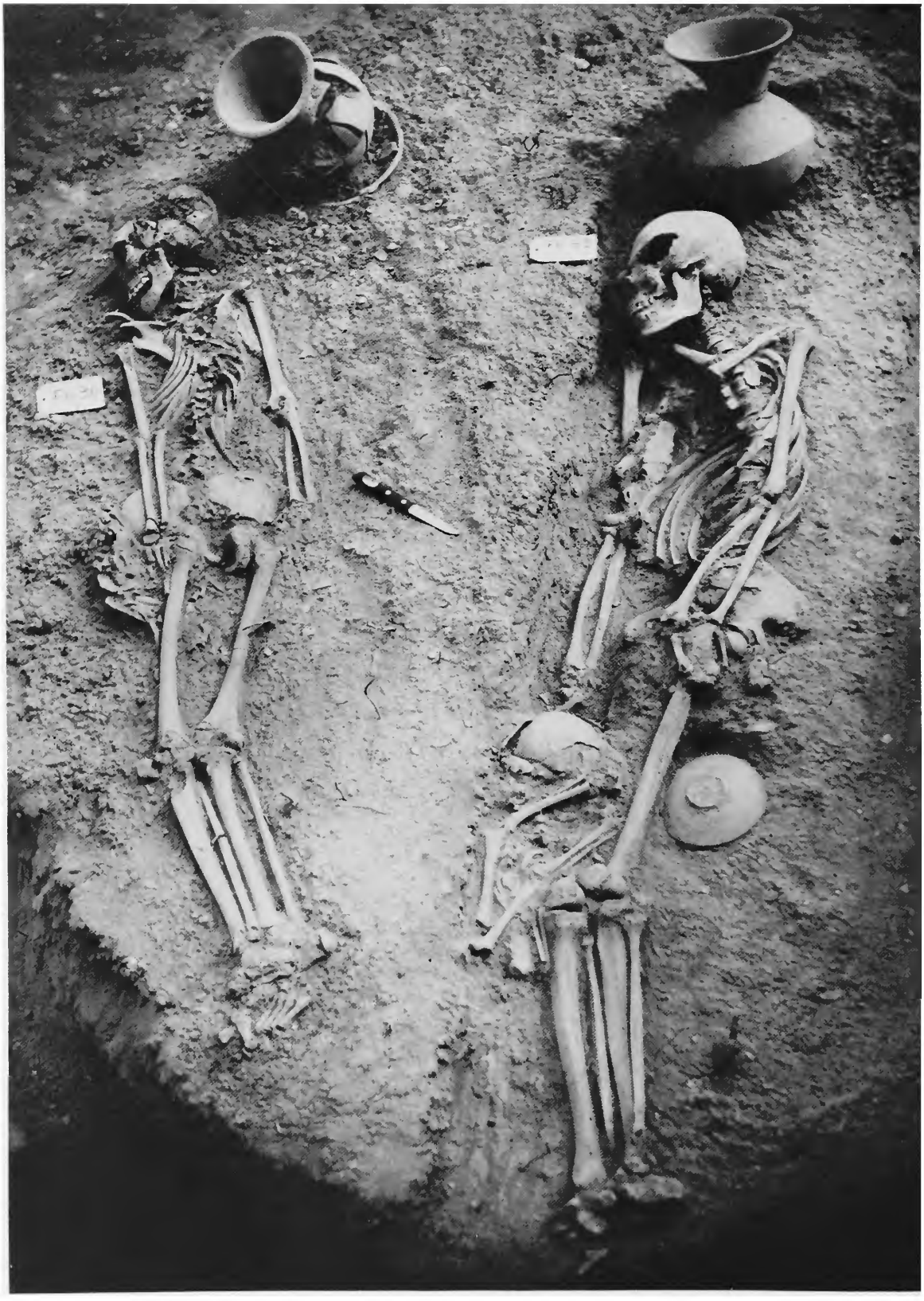

FIGURE 76.—Articulated infant and ceramic plate near adult leg bones, feature 43.

FIGURE 77.—Ceramic vessel associated with feature 43.

of the pit were maximum length, 1.92 m, and width, 40 cm.

An articulated infant was found on top of the right femur (Figure 76). The infant was lying on its back with legs extended back over the chest area. On the N side of the left femur was a compotera plate. A small ceramic vessel was located 4 cm SW of the skull (Figure 77). A concentration of beads occurred below the skull in the neck region. The beads were lying end to end as if they had been strung.

Seven groups of small triangular copper plates were found associated with the skeleton. Four of these (at least 10, 10, 10, and 16 plates in each) were concentrated within a 5 cm area just N of the right elbow. One group (at least seven plates) was found resting on the left ilium just above the acetabulum. A sixth group (at least 10 plates) was found just below the infant on top of the adult right femur midshaft. The final group (at least 10 plates) was found below the ribs 10 cm SW of the left ilium. One metal ornament was found directly beneath the right mastoid process.

The ceramic vessel is complete and displays a rounded lip, everted rim, concave everted neck, and carinated oval body with a rounded base. There are no appendages, and decoration is confined to a single line of punctations extending around the base of the neck. A smooth red slip extends from the rim down 25 mm on the inside and down 220 mm on the outside. Dimensions are as follows: maximum rim diameter, 182 mm; neck diameter, 84 mm; vessel diameter, 202 mm; maximum height, 270 mm, rim thickness, 7–9 mm.

FIGURE 75.—Primary skeletons, features 36 and 43.

The compotera plate displays a lip beveled interiorly with a concave everted rim. The plate is 160 mm in diameter and has a rim thickness of 8 mm.

One hundred seventy-six beads were recovered from this feature, 174 type D, one type G, and one type K.

All of the groups of copper plates are badly eroded, but measure roughly 22 mm in height by 18 mm in width at the base. They are still bound together by the original fabric.

The primary adult skeleton is generally complete. Copper stains occur on the left posterior surface of the ilium and the proximal end of the right ulna. Morphology of the pelvis suggests male sex. The symphyseal faces of the pubes display complete ventral ramparts, but no rim formation, suggesting an age of 40 to 50 years at death. All sutures are fused endocranially, but only the sagittal suture shows fusion ectocranially.

The articulated infant remains are also complete. Of the major bones, only the left radius, ulna, and clavicle are missing. The maxillary deciduous second molar shows a complete crown with 25 percent root formation and the maxillary permanent first incisor shows a crown 25 percent formed. This suggests an age at death of between nine months and one year. This age at death is also suggested by the length of the left femora, 140 mm, and the tibiae, 119 mm.

FEATURE 44 (Primary Skeleton, Square A-1, Main Cut).—This feature consists of the skeleton of a child exposed in early 1973. It was found at a depth of about 40 cm, immediately SW of feature 21 in the eastern aspect of square A-1. The skeleton had been isolated on a pedestal that collapsed on 17 July 1973. Although information on position, head direction, and extent of articulation is not available, the author did observe that the mandible and the skull were articulated. Of the major bones, only the right femur and the left clavicle are missing. Dental formation data suggest an age at death of about six years.

No cultural material was associated with the skeleton.

FEATURE 45 (Primary Skeleton, Square A-0 and Southern Extension, Main Cut).—This feature was found in 1973 by the author and represents an adult skeleton lying on its right side with the skull WSW of the postcranial skeleton. The skeleton was lying within the powdery soil layer directly on top of the shell layer. No pit outlines were distinguished. A single shell (*Protothaca asperrima*) was located within each eye orbit and a copper ring was found within the nasal cavity. A small ceramic vessel and compotera plate were found resting against the SW side of the skull. The skeleton measured 1.48 m in length, NE–SW, and 24 cm in width, NW–SE. Depth to the skull was 62 cm.

The ceramic vessel (Figure 78) displays a rounded lip, everted rim, concave everted neck, rounded oval body, and rounded base. There are no appendages and no decorations. The texture is rough on the inside of the vessel but smooth on the outside. A red slip occurs over most of the outer surface and the rim with poorly-defined borders. Dimensions are as follows: maximum rim diameter, 105 mm; minimum neck diameter, 57 mm; maximum body diameter, 123 mm; maximum height, 161 mm; rim thickness, 4–6 mm; body thickness, 5 mm.

The compotera plate displays a flat lip, slightly concave everted rim, with a carination 22 mm below the lip. There are no appendages, and decoration consists of a combed incised pattern on the inside of the plate (Figure 79). The texture is rough and eroded with no slip. Horizontal smoothing striations occur on the rim above the carination on the outside of the plate. Dimensions are as follows: maximum rim diameter, 189 mm; diameter at carination, 180 mm; diameter at plate-pedestal junction, 65 mm; height of plate, 45 mm; plate thickness, 4–8 mm.

The skeleton is generally complete. A wide sciatic notch, deep preauricular sulcus, small mastoid processes, and slight browridges all suggest female sex. In addition, the skull displays all sutures open both endocranially and ectocranially. The line of fusion is still visible around the epiphyses of the long bones. The third molars are erupted, but display little wear. All of this suggests an age at death between 20 and 25 years.

FEATURE 46 (Partially Disturbed Primary Skel-

FIGURE 78.—Ceramic vessel from feature 45.

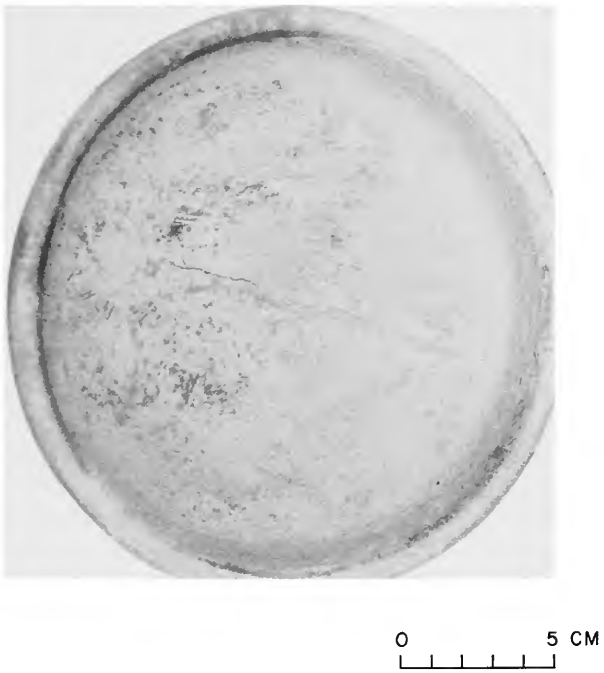

FIGURE 79.—Compotera plate from feature 45.

eton, Western Extension, W of Square A-2, Main Cut).—This skeleton was found and excavated in 1973. The skeleton was lying on its back with arms extended at the sides, with the skull NE of the postcranial skeleton. The skeleton was articulated from the skull through the innominates, but the leg area was disturbed. The right femur was missing completely and only the proximal third of the left femur was in situ. Bone and pottery fragments were scattered W of the skeleton, implying this individual was disturbed by a more recent excavation. No pit outlines were distinguished; however, the skeleton was lying within the powdery soil layer at a depth to the skull of 30 cm. A small ceramic figurine was found 30 cm N of the skull of feature 46, and 20 cm W of feature 25. The figurine was probably associated with feature 46, but this is impossible to determine positively. Ceramic fragments were concentrated above the right shoulder. A concentration of beads was found in the neck region. Some appeared to be aligned as if strung and others did not. A total of 201 beads were recovered. Of these, 118 are type D, five are type F, one is type G, one is type I, and 76 are type P.

The ceramic figurine (Figure 100) measures 93 mm in height, 67 mm in width across the arms, and 28 mm thick in the chest area.

One small obsidian fragment represents the only other artifact from this feature.

The human remains are generally complete from the pelvis through the skull. Female sex is suggested by a preauricular sulcus and wide sciatic notch on each innominate, small mastoid processes on the skull, and general gracility of the long bones. All cranial sutures are open ectocranially and endocranially, and the third molars display slight wear. This generally suggests an age of 25 to 30 years.

FEATURE 47 (Primary Skeleton, Western Extension, W of Square A-0, Main Cut).—This feature consists of an infant skeleton articulated from just above the waist to the skull. The lower half of the skeleton was not present, and probably had been removed prior to our excavation. The skeleton was lying on its back with arms extended, the skull WSW of the postcranial skeleton, at a depth of 43 cm. The skeleton was lying within the powdery layer and no pit outlines could be distinguished.

The mandibular permanent left first molar shows a crown 75 percent complete. This suggests an age at death of about two years. No cultural remains were associated.

FEATURE 48 (Primary Skeleton, Square A-1 and Western Extension, Main Cut).—This feature consists of an adult skeleton lying beneath and slightly S of feature 24. A concentration of thick ceramic fragments was found above the skeleton just SW of feature 24 at a depth of 35 cm. The highest ceramic fragment in the concentration was the round-pointed base of a large urn, suggesting that an inverted urn may have been present. The adult female skeleton was lying on its stomach and right side with legs and arms extended. The skull was WSW of the postcranial skeleton at a depth of 1.07 m. The skeleton measured 1.47 m NE–SW, and 28 cm NW–SE. A concentration of infant bones occurred immediately above the left femur. Associated artifacts included a small fragmentary ceramic vessel, found just S of and against the knees; two ceramic plates from just N of the skull; three metal rings, two found in situ, one at each mastoid process; and groups of copper plates from three locations: below the left hand, just S of the right elbow, and just S of the right radius-ulna midshaft. Twelve groups are present with minimal individual plate counts of 5, 7, 8, 8, 9, 10, 10, 12, 13, 15, 19, and 19. The skull and mandible of a *Lama* sp. were found resting on the lower plate near the skull.

One of the ceramic plates consists of the plate portion of a compotera. It displays a lip beveled interiorly, a concave everted rim, and a carination 20 mm below the rim. There are no appendages and no decorations; however, a smooth red slip occurs on the interior and exterior surfaces above the carination. The outside surface below the carination is coarse with no slip. The inside plate surface has irregular polishing striations with some erosion. The rim shows horizontal striations inside and out. Dimensions are as follows: maximum rim diameter, 217 mm; diameter at carination, 207 mm; diameter at plate-pedestal junction, 67 mm; plate thickness, 8–12 mm. The other plate is not available for examination.

Two hundred thirty-six shell beads were recovered. Of these 211 are type D, 23 are type F, and two are type G.

The adult skeleton is relatively complete. The wide sciatic notches and preauricular sulci of the pelvis suggest female sex. All cranial sutures are open, and the third molars are erupted, but show only slight wear. Collectively, these data suggest an age at death of between 25 and 30 years.

The infant remains represent at least two individuals, and are presented in detail in Table A81. Most of the remains represent a very young infant, who died at birth or soon after. A maxillary deciduous second molar from this individual shows initial coalescence of cusps. The older infant displays a femoral length of 98 mm, which generally suggests an age at death of between six months and one year.

FEATURE 49 (Primary Skeleton, Western Extension, W of Square A-1, Main Cut).—This feature consists of an extended primary adult skeleton (Figure 80) lying on its right side on top of the shell layer. The skull was SW of the postcranial remains at a depth of 80 cm. The skeleton measured 1 m in length and 30 cm in width. The pit for feature 23 intersected the skeleton just below the pelvis, so that the legs and feet of feature 49 were not present. Directly on top of the skull was a ceramic plate containing the articulated partial skull and mandible of a deer (*Odocoileus* sp.). Just SW of the deer skull was a small ceramic vessel sitting upright and resting on a long-necked compotera. Three large axe-shaped copper plates were found: one just above the right hand, one just above the right elbow (visible in Figure 80),

and one just N of the lumbar vertebrae below the left elbow.

The ceramic jar (Figure 81) is complete except for part of the rim. It displays a rounded lip, everted rim, concave everted neck, rounded oval body with a rounded base. There are no appendages, and decoration is confined to a single line of punctations that are 3 mm in diameter and 5 mm apart. A smooth red slip extends from the rim down 32 mm on the inside and over the entire outside surface. Vertical striations occur on the entire outside surface with horizontal striations on the inside of the rim. Measurements are as follows: rim diameter, 139 mm; neck diameter, 59 mm; body diameter, 157 mm; maximum height of vessel, 182 mm; height to decoration at neck, 122 mm; rim thickness, 6–8 mm.

The compotera is complete except for part of the base. It displays a rounded lip, concave everted rim, with a carination 28 mm below the lip. There are no appendages, and decoration consists of an incised design on the inner surface of the plate (Figure 82). The texture is smooth with a red slip extending from 5 mm below the carination up to the rim on the outside surface, and from the rim down 38 mm on the inside surface. Smoothing striations occur on the outside of the rim; all other outside surfaces have no striations. Dimensions are as follows: maximum rim diameter, 232 mm; diameter at carination, 218 mm; diameter at plate-pedestal junction, 85 mm; base diameter, 208 mm; maximum height, 278 mm; rim thickness, 5–9 mm; base thickness, 3–5 mm.

The human skeleton is generally complete from the pelvis to the skull. Cranial and pelvic morphology strongly suggest male sex. An age of 25 to 30 years is suggested by the fully erupted third molars, which display minimal wear.

FEATURE 50 (Funerary Urn, Northern Extension, N of Square A-3, Main Cut).—This feature consists of a funerary urn with a very fragmentary inverted urn covering. The covering was removed on 6 August 1973, and the remainder of the urn was removed on 15 August 1973. The covering extended from the ground surface to a depth of about 55 cm. The upright urn extended from a depth of 50 cm down to a depth of about 1.2 m. The bone concentration was encountered at a depth of 70 cm, along with an inverted complete ceramic vessel and a compotera resting on its side (Figures 83, 84). In the SW corner of the concentration, a left and a right femur were resting nearly vertically with the heads facing each other in correct anatomical position. The femora were articulated to the tibiae and the fibulae, which extended horizontally within the concentration. In addition, the articulated sacrum, pelvis, and two lumbar vertebrae were found between the knees. The position of the bones suggested that the entire lower half of the individual was probably articulated at the time of burial and the pelvis, sacrum, and vertebrae slipped down as soft tissue decomposition progressed. The other vertebrae and bones of the feet were not articulated. Bones from the rest of the skeleton of this individual were present within the urn, but were not articulated. The urn fill above the bone concentration was extremely fine and loose.

The ceramic vessel is complete and displays a lip beveled interiorly, a rim interiorly thickened, a concave everted neck, a rounded body with a rounded base. There are no appendages and no decorations. The texture is smooth with a red slip extending from the rim down 153 mm on the external surface. There are vertical striations on the outer surface; and horizontal striations on the inside rim. Dimensions are as follows: maximum rim diameter, 128 mm; minimum neck diameter, 61 mm; maximum body diameter, 160 mm; maximum height, 195 mm; rim thickness, 6–9 mm; body thickness, 7–9 mm.

The compotera is complete and displays a lip beveled interiorly, concave everted rim, with a carination 22 mm below the lip. The rim is slightly irregular in shape and there are no appendages. Decoration consists of an incised pattern on the interior of the plate (Figure 85). The texture is rough, with no slip. The inside of the plate is white in color with orange incisions. Horizontal striations occur on the outside of the rim and inside of the base. Dimensions are as follows: maximum rim diameter, 189–193 mm;

FIGURE 80.—Primary skeleton with associated artifacts, feature 49; note ceramic vessels and deer skull above human skull and large copper plate above right elbow area.

FIGURE 81.—Ceramic jar from feature 49.

FIGURE 82.—Compotera plate surface, feature 49.

diameter at carination, 172–174 mm; diameter at plate-pedestal junction, 68 mm; base diameter, 142 mm; height of compotera, 110 mm.

The urn itself was not reconstructed; however, field measurements show a rim diameter of 41 cm, an estimated height of about 70 cm, and maximum diameter of about 60 cm.

Seven metal rings were recovered. One of these was adhering to the parietal-temporal area of the skull and the others were mixed in the concentration.

One hundred eighty-four shell beads were recovered from this feature. Of these eight are type D and 176 are type F.

Skeletal remains from this urn weigh 7660 g, and represent at least six adults and five subadults. Detailed inventories of the adult and subadult bones are presented in Tables A28 and A82. Note that five adults are indicated by right femora and six by left tibiae, but relatively few adults are represented by other bones.

Morphology of the adult humeri indicates that at least three males and two females are present.

Age at death for each individual is estimated through microscopic examination of sections taken from the right femora. These observations and age estimates are summarized in Table 15. Specimen 50-5 represents the articulated adult described earlier. This individual is female with an estimated age of 39 years. The five subadult

TABLE 15.—Ages estimated for adults in feature 50 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
50-1	85	22	4	0	35	
50-2	77	36	0	0	37	
50-3	76	30	0	0	38	F
50-4	86	41	0	0	40	
50-5	95	32	5	1	39	F

FIGURE 83.—Skeletal concentration and artifacts within feature 50, view from SE.

FIGURE 84.—Skeletal concentration and artifacts within feature 50, view from E.

FIGURE 85.—Incised design on compotera plate surface, feature 50.

individuals are of the following estimated ages at death: 8–8.5 years; 7.5–8.5 years; 4–5 years; 1–2 years; and 0–3 months. In the oldest subadult, the permanent first molars have erupted to the occlusal plane and are fully formed, and the maxillary permanent left second molar shows a crown complete with 25 percent root formation. This suggests an age at death of 8–8.5 years. The other ages at death are based upon a combination of criteria including dental development and maximum length of the long bones.

FEATURE 51 (Funerary Urn, Northern Extension, N of Square A-3, Main Cut).—This feature consists of a funerary urn with an inverted urn covering found and excavated in August 1973. At the time of discovery, the inverted urn covering was unbroken; consequently, little soil had sifted down into the upright urn. When the cap was removed, the skeletal material was fully exposed (Figure 86). The lower urn was completely filled with human remains. The inverted urn covering extended from the surface to a depth of about 60 cm. The lower urn extended from a depth of 50

cm to a depth of about 90 cm. At a depth of 80 cm, an articulated foot was found, associated with a concentration of shell beads and three groups of copper plates. Two metal rings were found 10 cm above the copper plates. The lower urn extended through the shell layers into the clay.

The urn covering is complete and displays a lip beveled interiorly, everted rim, concave everted neck, and a round-pointed base. Dimensions are as follows: maximum rim diameter, 44 cm; maximum vessel diameter, 74 cm; maximum height, 84 cm; rim thickness, 19–22 mm.

The upright urn displays a lip beveled interiorly, everted rim, concave everted neck, with dimensions as follows: maximum rim diameter, 43 cm, maximum urn diameter, 58 cm. The base is not present.

Eight hundred forty-two beads were recovered from this feature. Of these, 603 are type D, 17 are type F, and 222 are type G.

A total of 26 groups of small triangular copper plates were recovered. Excessive decomposition prevents an accurate count of the number of individual plates in each group; however, minimal counts of those present range from four to 20. A total of 299 individual plates were counted, for an average of 11.5 per group.

Human remains from this feature weigh 7620 g and represent five individuals: at least two adults and three subadults (Tables A29 and A83). The adults are both male and are generally complete. Morphology of the skull and pubes suggest ages at death of 28–32 years and 45–50 years for these two adults. One calcined long bone shaft fragment is present.

Dental development and long bone lengths of the subadults suggest ages at death of about one, 11, and 12 years. The 12-year-old is generally complete and displays united epiphyses on the femoral heads, right greater trochanter, and left lesser trochanter. Epiphyses are not united on the distal femora, the left greater trochanter and the right lesser trochanter. The left calcaneus and talus of this individual were articulated and show signs of recent epiphyseal union.

The 11-year-old is less complete, and the one-year-old is represented by a few bones only.

FEATURE 52 (Funerary Urn, Northern Extension, N of Square B-3, Main Cut).—This feature consists of a funerary urn with an inverted urn covering located and removed in August 1973. The covering lacked both its base and rim and extended from ground surface to a depth of 34 cm. A pit outline was detected that closely followed the contour of the feature, except on the northern side where it extended northward. This extension of the pit outline began at a depth of 34 cm and angled northward to the surface 34 cm N of the urn covering. This pit extension contained very dark soil with shells and adult human bones. The urn itself was filled above the bone concentration with dark soil and a few shells. The skeletal concentration was encountered at a depth of 58 cm and extended to the bottom of the urn (Figure 87). At a level of about 65 cm in the eastern edge of the concentration, there occurred the articulated pelvis, femora, tibiae, fibulae, and foot bones of a 12 to 14 year old subadult. The articulated right radius and ulna occurred immediately S of the right femur and the articulated left radius and ulna and distal end of the left humerus occurred immediately to the left of the left femur. The lower legs were tightly flexed beneath the femora, so that the feet were below the pelvis. A broken compotera was present in the SW aspect of the concentration. Two fragments from that compotera were found 35 cm to the NE within the urn.

The urn covering lacks both its base and rim and measures approximately 59 cm in diameter.

The upright urn is generally fragmented but complete, and measures 59 cm in diameter and 59 cm in height.

The reconstructed compotera is complete and displays a lip beveled interiorly, with a straight everted rim. A red slip occurs on the outside plate surface. Dimensions are as follows: maximum rim diameter, 173 mm; maximum height of vessel, 137 mm; maximum base diameter, 163 mm; rim thickness, 10 mm; base thickness, 9 mm.

One fragmentary metal ring was recovered from the base of the urn.

FIGURE 86.—Funerary urn and skeletal concentration, feature 51.

FIGURE 87.—Skeletal concentration within feature 52.

Human remains from within the urn weigh 7813 g and represent at least seven individuals: three adults and four subadults (Tables A30 and A84). The three adults represent at least one male and one female. Sex can not be estimated for the third adult. Table 16 summarizes the ages at death for each of these individuals, estimated from the microscopic examination of femoral sections. The estimated ages are 36 years for the male, 37 years for the female, and 30 years for the adult of undetermined sex.

At least four subadults are present: one between 12 and 14 years, one between 8 and 9 years, and two about birth. The 12- to 14-year-old articulated individual is generally complete. The third molar roots are 50 percent formed and the second molar has erupted with slight wear. The 8- to 9-year-old is represented only by a left mandible fragment. A radiograph of this fragment shows the root 25 percent developed on the second molar. A third child is represented by both femora, both tibiae, humeri, ulnae, radii, and one left clavicle. The final individual is represented only by a right femur and right humerus. Rodent gnaw marks occur on a left adult femur.

TABLE 16.—Ages estimated for adults in feature 52 from femoral cortical microstructure

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*
52-1	70	35	0	0	36
52-2	87	21	1	0	37
52-3	81	17	9	3	30

Twenty-five beads were recovered from this feature: six type A, eight type D, and 11 type E.

Two metal discs about 9 mm in diameter were found associated with copper wire about 1 mm in diameter. The discs probably were once attached to each end of the wire.

FEATURE 53 (Funerary Urn, Northern Extension, N of Square A-3, Main Cut).—This feature consists of a funerary urn with inverted urn covering, located and excavated in August 1973. The covering extended from the surface down 46 cm, and lacks both its base and rim. The upright urn extended from a depth of 30 cm to 1.03 m. A small bone concentration was encountered at a depth of 30 cm near the rim of the upright urn. Within the urn from 30 to 50 cm, occurred only small fragments of bone, sherds and soil. At a depth of about 50 cm, the main secondary bone concentration occurred (Figure 88).

The urn covering is approximately 70 cm in diameter. Due to its fragmentary condition, the covering was not measured in greater detail.

The upright urn is also approximately 70 cm in diameter. It displays a lip beveled interiorly, a concave everted neck, and a round-pointed base. The vessel has a rim diameter of about 46 cm and a height of about 70 cm.

A ceramic vessel (Figure 89) was found near the bottom of the skeletal concentration. It is complete and displays a flat lip, everted rim, concave everted neck, rounded oval body, and rounded base. There are no appendages, and decoration consists of three raised lines around the rim. The texture is smooth with a red slip extending down from the rim 16 mm on the inside and 178 mm on the outside. Vertical striations occur on all surfaces. Dimensions are as follows: maximum rim diameter, 147 mm; neck diameter, 60 mm; diameter of vessel, 184 mm; height, 223 mm; rim thickness, 7–8 mm.

A compotera plate was found near the ceramic vessel. It displays a flat lip, concave everted rim, with a carination 20 mm below the lip. There are no appendages, and decoration consists of a combed incised pattern (Figure 90) on the inside of the plate. The texture is coarse with no slip, and smoothing horizontal striations occur on all surfaces. Dimensions are as follows: maximum rim diameter, 187 mm; diameter at carination, 173 mm; diameter at plate-pedestal junction, 55 mm; height of plate, 35 mm; rim thickness, 5–7 mm.

Four oyster shell (type A) beads and four ceramic discs were found. Two of these discs had perforations and two lacked them.

A total of 11,631 g of human bone was recovered from this feature representing at least 14 individuals: seven adults and seven subadults (Tables A31 and A85). Skeletal remains were recovered from three locations within this feature. A small concentration of fragmentary remains were found mixed with sherds on top of the feature at ground level. All of these bones are small, fragmentary, and extremely eroded; they represent at least one adult and one adolescent. A second concentration of human bones was found within the upper urn covering and extreme upper portion of the lower urn; it contains the very incomplete remains of two adults and two subadults. One of the adults is female. All subadult remains represent a single adolescent age 10–12 years except for one smaller left ilium.

All remaining bones were found within the lower urn and represent a total of seven adults and seven subadults. The adolescent represented in the upper urn is represented in the lower concentration as well. Mandible morphology indicates that of the adults at least three are male and three are female. The following ages at death were estimated for the adults: two adults of about 50 years (one female), two about 45 years, one of 36 years (male), one of 30 years, and one of about 20 years. These ages are based upon the extent of attrition on the mandible, supported by the morphology of the pubis and the degree of cranial suture closure. Within the lower concentration occurred the articulated right femur and innominate of a male about 35–40 years of age. One fibula fragment shows extensive evidence of rodent gnawing. Evidence of burning occurs on fragments from a mandible, distal right humerus, ulna, four ribs, and a femoral shaft. All are cal-

FIGURE 88.—Skeletal concentration within feature 53.

FIGURE 89.—Ceramic jar from feature 53.

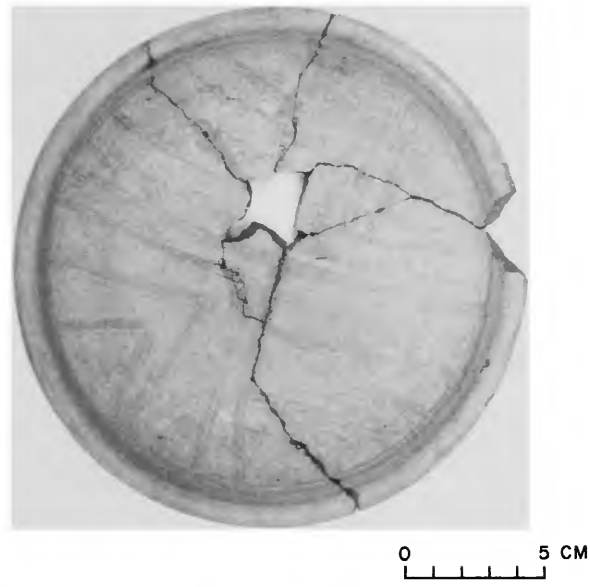

FIGURE 90.—Design on compotera plate surface, feature 53.

cined and warped, but display little transverse fracturing. The pattern suggests burning of the bone with flesh still attached.

The subadult remains represent at least seven individuals (Table A85). The extent of dental formation and long bone growth indicates the following ages at death, 10–12 years, five years, four years, six months, three months, and two individuals who died at birth or soon after.

FEATURE 54 (Isolated Subadult Skull, Northern Extension, N of Square A-3, Main Cut).—This feature consists of an isolated infant skull, mandible and the articulated first cervical vertebra, located and excavated in August 1973. The individual probably represents a once completely articulated primary skeleton, who was partially removed during the excavation of the pits for features 8, 50, or 51. The skull was found at a depth of 30 cm. The degree of dental formation suggests an age at death of about one year. No associated artifacts were found.

FEATURE 55 (Primary Skeleton, Northern Extension, N of Squares A-3 and B-3, Main Cut).—This feature consists of an extended adult primary skeleton (Figure 91) located and excavated in August 1973. The individual was lying on its back with legs and arms extended with the skull WSW of the postcranial skeleton. The skull was nearly in contact with and immediately E of feature 56. A small ceramic jar was located immediately S of the skull. The right malar of the skull was resting on the rim of the jar. The skeleton was lying directly on top of the shell layer, at a depth of 57 cm.

The ceramic jar (Figure 92) is complete except for a few fragments missing from the rim. It displays a rounded lip, everted rim, concave everted neck, carinated oval-shaped body, and annular base. There are no appendages, and decoration is confined to a single line of punctations 2 mm in diameter extending around the neck. The texture is smooth with horizontal striations below the rim and vertical striations above. Dimensions are as follows: maximum rim diameter, 80 mm; minimum neck diameter, 43 mm; body diameter at carination, 85 mm; base diameter, 51 mm; maximum height, 132 mm; rim thickness, 6–8 mm; body thickness, 7–10 mm.

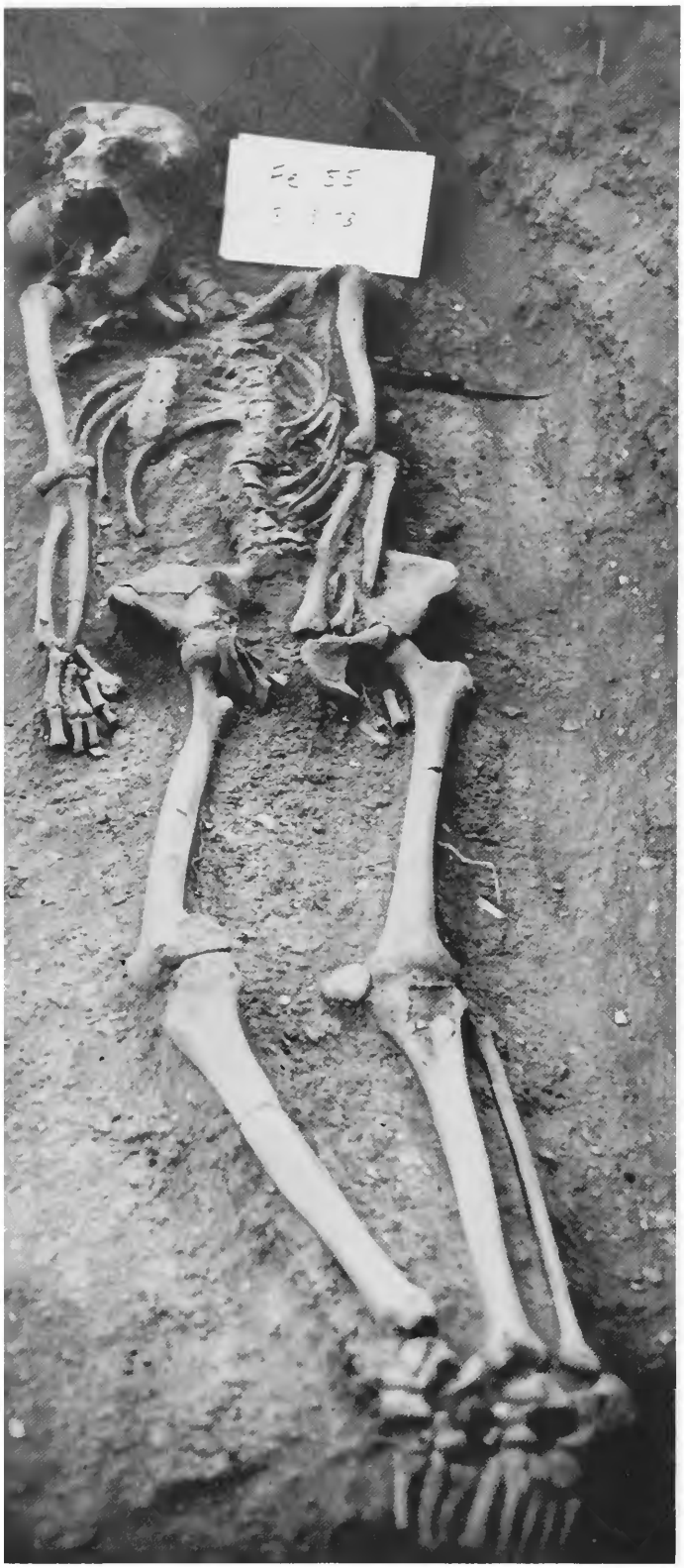

FIGURE 91.—Primary skeleton, feature 55.

FIGURE 92.—Ceramic jar from feature 55.

TABLE 17.—Ages estimated for adults in feature 56 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
56-1	66	35	0	0	35	–
56-2	76	34	0	0	36	F
56-3	76	27	0	0	37	M
56-4	67	25	0	0	35	F
56-5	69	42	0	0	35	M
56-6	64	15	0	0	26	–

The skeleton itself is complete. Morphology of the skull and pelvis suggests male sex. An age at death of 30–32 years is suggested by nearly complete ventral ramparts on the pubic symphyses; slight wear on the third molars, and the extent of attrition on the first and second molars.

FEATURE 56 (Funerary Urn, Northern Extension, N of Square A-3, Main Cut).—This feature represents a funerary urn (with an urn covering) that was located, excavated, and removed in August 1973. The urn covering was so fragmentary that its position could not be determined. The covering extended from the ground surface down 20 cm. The upright urn extended from a depth of 20 cm down to a depth of 1.1 m. The skeletal concentration began at a depth of about 30 cm and continued down to the bottom of the urn. No bone articulation was observed.

The urn itself was never reconstructed; however, field measurements show a maximum diameter of 58 cm, maximum height of 90 cm, and a rim diameter of about 38 cm.

One hundred sixty-nine beads were recovered from this feature. Of these, 62 are type A, six type B, one type C, 35 type D, 46 type E, 16 type F, and three type H.

One fragment of a metal ring was recovered from the urn.

A total of 17,279 g of human bone was recovered from this urn, representing at least 10 adults and six subadults. Although most of the human bones were found within the upright urn, some fragmentary remains were recovered from inside the covering. All of these are adult and are summarized in Table A32. A detailed inventory of all of the adult bone recovered in the feature is presented in Table A33. Note that the adult bones are unevenly represented. At least 10 adults are represented by maxillae, while only four are represented by the left radius and only five by the clavicle. Ages at death for the adults were estimated using a number of different criteria. For six of the adults, sections were prepared for microscopic analysis. The counts and resulting six estimates of age at death are summarized in Table 17. In addition, examination of the maxillae and other post-cranial material indicates a very old female is present, as well as one individual age 20–24, one age 24–28, and one other adult age 20–50. Cranial morphology indicates that probably six males and four females are present.

One left adult femur shaft shows extensive evidence of rodent gnawing. The same specimen displays a network of irregular shallow cuts 85 mm long on the anterior surface of the proximal end, just below the lesser trochanter.

Bones representing the six subadults are presented in Table A86. Long bone lengths and the stages of dental formation suggest the following ages at death for these six individuals: birth or soon after, birth to three months, about six months, about nine months, about three years, and about 15 years. The 15-year-old individual shows third molars with 50 percent root formation. Epiphyses are still not united on the proximal and distal femur, proximal and distal humerus, and proximal tibia.

FEATURE 57 (Funerary Urn, Northern and Western Extensions, NW of Square A-3).—This feature consists of a small funerary urn approximately 1.5 m SW of feature 53 and 1 m S of feature 58. The upper level was badly fragmented but it appeared that some covering had been present since several large sherds occurred outside of the funerary urn on the eastern side. The urn extended from a depth of 17 cm down to a depth of 56 cm. At the extreme bottom of the urn occurred a somewhat articulated infant. The skull was resting on its left parietal, just S of the knee region. The ribs, vertebrae, and leg bones were all articulated. The skeleton was on its back with the skull S of the postcranial remains. The legs were very tightly flexed over the chest area. The actual bones recovered from this infant are summarized in Table A87. Note, however, that much of the bone material is extremely fragmentary and thus many bones may have been present although they are not represented in the table. The mandibular deciduous right first molar shows a root 75 percent formed. This and other dental data suggest an age at death of about 18 months.

FIGURE 93.—Two stacked funerary urns, feature 58.

FIGURE 94.—Skeletal concentration within upper urn, feature 58.

The total human remains recovered from this feature weigh only 213 g and contain the following bones in addition to the articulated infant: one infant right femur (75 mm in length); an adult distal hand phalanx, an adult first cervical vertebra; and a mandibular permanent molar showing slight wear on the occlusal surface, with a contact facet on the mesial surface but no contact facet on the distal surface. This suggests an age at death of either 7–8 years or 13–14 years depending if this molar is a first or second.

The urn itself is very fragmentary, but measures approximately 48 cm in diameter with a height of about 39 cm.

FEATURE 58 (Funerary Urn, Northern and Western Extensions, NW of Square A-3, Main Cut).—This feature consists of two stacked funerary urns (Figure 93), which were located, excavated, and removed in August 1973. The upper urn extended from the ground surface down to a depth of 80 cm. The ground surface above this feature contained some human skeletal remains mixed with sherds and soil. Within this urn, the first 40 cm contained a mixture of soil and sherds. A concentration of human remains extended from

TABLE 18.—Ages estimated for adults in feature 58 from femoral cortical microstructure; sex determined by femoral morphology

Bone no.	*No. of secondary osteons*	*No. of osteon fragments*	*Average % lamellar bone*	*No. of primary osteons*	*Age*	*Sex*
58-1	75	24	10	1	30	M
58-2	84	30	0	0	40	F
58-3	75	–	0	0	36	M
58-4	62	–	9	1	26	M

the depth of 40 cm to the bottom of the covering (Figure 94). The lower urn lacks a rim and extended from a depth of 50 cm to 1.1 m. The bone concentration within the lower urn extended from a depth of about 80 cm down to the bottom of the urn. No bone articulations were detected from this feature.

Neither of the two urns was reconstructed; however, field measurements indicate that the upper urn had a maximum diameter of 70 cm and a height of 80 cm. The lower urn measured 70 cm in diameter and 70 cm in height. The base of the upper urn formed a rounded point while the base of the lower urn was nearly flat.

Forty-two beads were recovered: three type A, 32 type D, one type E, and six type F.

Four metal rings were recovered.

Total human remains from this feature weigh 11,097 g and represent a total of ten individuals: five adults and five subadults. Human remains from this feature were concentrated in three units: on top of the feature at surface level; within the upper urn; and within the lower urn. Detailed inventories of individual bones within each of these three concentrations are presented in Tables A34, A35, A36, A88, A89, and A90. The total bone inventory for this entire feature is summarized for adults and subadults separately in Tables A37 and A91. Although these three skeletal concentrations were spatially distinct within the feature, they share skeletal parts of common individuals. In particular, bones of a nine-year-old child were found in all three units. Matching fragments of a 12-year-old right femur were recovered from both the upper and lower units. A female proximal left femur from the upper urn belongs to the same individual as a proximal right femur from the lower urn.

Cranial morphology indicates that at least one female and three males are present. Sex can not be estimated reliably for the fifth adult.

Ground thin-sections were prepared from the left femur of a male and the right femora of a female and two males for microscopic age determination. An age of 40 was estimated for the female, while male ages were apparently 26, 30, and 36. These data are presented in greater detail in Table 18. These age estimates are generally compatible with age changes observed in the pubis and the dentition. An age estimate is not possible for the fifth adult.

At least five subadults are present. The oldest subadult is represented by most of the long bones and vertebrae and was found in both the upper and lower urn. Epiphyses are not united on the proximal femur, the greater and lesser trochanters, and the proximal humerus. The degree of dental formation suggests an age at death of about 12 years. Subadult two is represented by most of the long bones and was found in all three concentrations. Long bone length and dental formation data suggest an age at death of about nine years. Subadult three is also represented by most of the long bones and was found entirely within the lower urn. Again, the long bone length and dental data suggest an age at death of about six years. Subadult four is represented only by a left ilium found within the upper urn. The size of the bone suggests an age at death between six months and one year. The fifth subadult is also represented by a left ilium found within the upper urn. Its somewhat smaller size suggests an age at death between birth and six months.

Rodent gnaw marks occur on fragments of a left femur and fibula shaft from within the upper urn, a subadult right tibia also from the upper urn, and a subadult right radius from the lower urn.

FEATURE 59 (Funerary Urn, Northern and Western Extensions, NW of Square A-3, Main Cut).—This feature consists of a small funerary urn located, excavated, and removed in August 1973. The urn extended from a depth from the surface of 12 cm down to a depth of 77 cm. Within the urn, a mix of soil and sherds occurred from a depth of 12 cm from the surface down to 30 cm. The bone concentration occurred from the depth of 30 cm to the bottom of the urn. On top of the bone concentration was a complete ceramic jar resting on its side. Bone articulation was confined to an adult left tibia and fibula from the bottom of the urn. No other bones were articulated, not even bones of the left foot.

Field measurements of the urn are as follows:

rim diameter, 37 cm; maximum diameter, 53 cm; height, 65 cm. The urn displays a lip beveled interiorly, everted rim, and concave everted neck.

The ceramic jar found within the urn is complete and displays a lip beveled interiorly, an everted rim, concave everted neck, carinated body, and rounded base (Figure 95). There are no appendages, and decoration is confined to a single line of punctations extending around the neck. Each punctation is about 5 mm in diameter and 4–5 mm from the next. The texture is smooth with a red slip extending from the rim down 20 mm on the inside and 148 mm on the outside base. Vertical striations occur on the rim and upper body; horizontal striations occur on the lower part of the body and inside rim surface. Dimensions are as follows: maximum rim diameter, 142 mm; minimum neck diameter, 65 mm; diameter at carination, 150 mm; maximum height, 193 mm; rim thickness, 3–7 mm. No other artifacts were recovered from this feature.

FIGURE 95.—Ceramic jar, feature 59.

Human remains from this feature weigh 3634 g and represent a single adult male. As Table A38 shows, the skeleton is relatively complete. Male sex is suggested by a narrow sciatic notch on the ilium, large mastoid processes, large supraorbital ridges on the skull, and a femoral head diameter of 45 mm.

A ground thin-section from the midshaft of the left femur revealed 70 secondary osteons, 25 osteon fragments, no lamellar bone, and no primary osteons. This suggests an age at death of about 35 years. This estimated age at death is compatible with an incomplete ventral rampart on the pubis, cranial sutures that are open endocranially and ectocranially, and slight wear on the second and third molars.

Rodent gnaw marks occur on the distal right femur.

FEATURE 60 (Funerary Urn, Cut E).—This feature consists of a funerary urn lacking its rim and covering. The feature was located, excavated, and removed in August 1973. The top portion of this urn actually extended through the ground surface, thus it is possible that the rim and or covering may have been present at one time but eroded away. The urn extended from the surface to a depth of 68 cm. Within the urn a mixture of sherds and soil extended from the surface to a depth of 15 cm. The bone concentration extended from this level to the bottom of the urn. The concentration is subdivided into three parts by two layers of sherds, one at a depth of 41 cm and another at a depth of 51 cm. The sherds composing these layers are large urn size sections (Figure 96). No bone articulation was observed within the feature.

According to field measurements, the urn was 66 cm in diameter and 68 cm in height. Since the upper portion of the urn was not present, additional measurements were not possible.

Fifty-seven beads were recovered: 56 type A and one type B.

A total of 21,044 g of human bone was recovered from this feature representing 25 individuals: 12 adults and 13 subadults. As mentioned before, human remains were concentrated in three horizontal layers within the feature, separated from each other by layers of sherds. These layers were analyzed separately and the individual bone totals for each layer are presented in Tables A39, A40, A41, A92, A93, and A94. Although differences among layers occur, parts of several individuals were found scattered throughout all three layers. Thus the layers do not represent separate individuals, but an arbitrary separation of comingled bones. A combined inventory of all skeletal material from this feature is presented for adults in Table A42 and for subadults in Table A95. For the adults at least twelve individuals are represented by left ulnae and right femora, although individual counts vary widely with different bones.

Cranial morphology and femoral head diameters indicate that at least four males and four females are present among the adults. Sex cannot be estimated reliably for the remaining four adults.

Ages at death were estimated from the extent of dental attrition. The following number of individuals were assigned to five-year age intervals: two from 20 to 25 years; three from 30 to 35 years; one from 35 to 40 years; two from 40 to 45 years; one from 45 to 50 years; and three of unknown age.

One long bone fragment from the middle bone layer is charred, and thus shows evidence of slight firing. In the upper level, the following bones are charred on both the outside and inside surfaces: proximal right femur, left temporal, right temporal, and proximal hand phalanx.

As Table A95 shows, at least 13 subadults are represented by right femora. Age of the oldest subadult is 6–7 years, as estimated from long bone lengths. Bones present for this individual include a left femur, right ulna, and left ilium from the upper level and a right tibia, ischium, several vertebrae, and several epiphyses from the middle level. Subadult number 2 is age 2.5 years as estimated from long bone length. Bones present include a left and right femur, a right ilium, and a left humerus from the middle level and a right tibia from the lower level. Subadult number 3 is age 1.7 years as estimated from the degree of dental formation. Bones present include a maxilla and mandible from the upper level, a right femur, right ilium, and right tibia from the middle level, and a right and left humerus from the lower level. Individual number 4 is age 1.5 years as estimated from dental formation data. Bones present include a right femur from the upper level, a left maxilla from the middle level, and a right maxilla and mandible from the lower level. Individual number 5 is age one year. Bones present are a mandible from the middle level and a right femur and a left and right humerus from the lower level. Age of subadult number 6 is estimated between six months and one year. Bones present consist of only a right femur from the upper level. Age of subadult number 7 is six months. Bones present include left and right femora, a right humerus,

FIGURE 96.—Layer of sherds within urn, feature 60.

and a left tibia from the middle level. Age of subadult number 8 is between birth and six months. Bones consist of both femora and both tibiae from the lower level. Subadult number 9 is also between birth and six months. Bones present include both femora and a left tibia from the middle level. Subadult number 10 is also between birth and six months. Bones present include a left femur from the upper level and a right femur and a left and right tibia from the middle level. Subadult number 11 is also between birth and six months. Bones present are a left and right femur from the upper level. Subadult number 12 died at birth or soon after. Bones present include a proximal left femur from the upper level and a right ilium and both femora from the middle level. Subadult number 13 also died at birth or soon after. This individual is represented only by a right femur from the upper level.

Rodent gnaw marks occur on the linea aspera and proximal shaft area of an adult left femur from the upper level.

FEATURE 61 (Funerary Urn, Cut E).—This feature consists of a funerary urn with inverted urn covering located, excavated, and removed in August 1973. The covering extended down from the surface to a depth of 30 cm and was badly fragmented, apparently due to surface exposure. The upright urn extended from a depth of 30 cm to a depth of 78 cm. Within the upright urn, the skeletal concentration began at a depth of 52 cm and extended down to the bottom of the urn.

The urn covering is too fragmentary and incomplete to allow accurate measurement. Field notes record a diameter of about 60 cm.

The upright urn is nearly complete and displays a lip beveled interiorly, direct rim, straight parallel neck, and a round-pointed base. Dimensions are as follows: rim diameter, 43 cm; maximum diameter, 69 cm; maximum height, 86 cm; rim thickness, 16–18 mm; body thickness, 15 mm.

Ninety-four shell beads were recovered from this feature: 87 type A, three type B, three type D, and one type O.

Human remains from feature 61 weigh 24,380 g and represent 20 individuals: 10 adulllts and 10 subadults (Tables A43 and A96). The bulk of the human remains from this feature was found within a homogeneous deposit in the lower urn. A smaller separate bone concentration, however, occurred within the covering. This concentration contained a few bones of at least two adults and two subadults. None of these bones could be matched positively with bones of individuals from the lower concentration, but they could represent the same individuals. The adult remains present within the covering are presented in Table A44. Subadult remains from the bones of the covering include one right and two left femora, one rib, two vertebrae fragments, one left humerus, one left temporal, and one first cervical vertebra. One left femur has an estimated maximum length of 80 mm, thus suggesting the individual died at birth or soon after. The larger left femur has an estimated length of between 160 and 200 mm suggesting an age at death of between 1.5 and 3 years.

Innominate and cranial morphology indicates that of the 10 adults within this urn, two are definitely male, five are definitely female and three are of undetermined sex. Ages at death for the adults were estimated using combined criteria of pubic symphysis morphology and cranial morphology, particularly cranial suture closure and the extent of dental attrition. The following number of individuals were assigned to age categories: one greater than 50 years; two, 45–50; two, 40–45 (male and female); two, 20–30 (females); one, 20–35 (male); one, 20–25 (female); and one, 20 (female).

Subadult age at death was estimated from dental formation data and from the length of the long bones. The following ages at death were recorded for each individual: one age 13–14, one age 3.5; one age one; and seven age birth–six months.

Rodent gnaw marks occur on one fibula shaft, one left humerus shaft, one right distal femur shaft, one right center portion of a femur shaft, two left tibiae mid-shaft areas, and one right tibia mid-shaft area. All of these bones are from adults.

FEATURE 62 (Funerary Urn, Cut E).—This fea-

ture consists of a fragmentary urn (with no covering) excavated and removed in August 1973. The upper aspect of this urn extended through the ground surface and consequently was badly fragmented and partially missing. The urn extended from the surface to a depth of 65 cm. The human bone concentration extended from a depth of 10 cm to the bottom of the urn. At the very bottom of the urn within the skeletal concentration occurred a completely articulated infant, resting on its back with the skull E of the postcranial skeleton (Figure 97). Several sherds were resting on the infant's vertebrae and the right humerus was resting on top of the sherds. Thus at the time of burial, the sherds must have been placed on the chest area of the child with the arm extending over the sherds. The left upper leg was semiflexed 120 degrees. The left lower leg was flexed unnaturally back toward the skull, so that the angle at the knee was about 50 degrees. A single metal ring was found in contact with the left parietal. Two metal rings were found in contact with the right parietal.

FIGURE 97.—Articulated infant within feature 62.

The urn itself was reconstructed and displays a lip beveled interiorly, everted rim, straight everted neck, and a rounded base. The color is predominantly black with gray areas. Dimensions are as follows: rim diameter, 30 cm; maximum diameter, 49 cm; height, 49 cm; rim thickness, 15 mm; body thickness, 7 mm.

Human remains from this feature weigh 8419 g and represent seven individuals: six adults and one infant (Tables A45 and A97). The adult remains are confined largely to long bones. Cranial and pelvic morphology indicates that of the adults, four males and two females are present. Ages estimated from morphology of the pubic symphysis indicate one female has an age greater than 50 years, one male 32–36 years, one male 18–21 years, and age cannot be estimated reliably for one female and two males.

As Table A97 shows, the infant is mostly complete. An age at death of two years is estimated from the stage of dental formation.

FEATURE 63 (Small Ceramic Vessel with no Human Remains, Cut E).—This feature consists of a small ceramic vessel located, excavated, and removed in August 1973. The vessel extended from a depth of 25 cm down to a depth of about 55 cm. The vessel contained only soil, 11 type D beads, one metal ring, and 1 crab claw at the very bottom. The vessel is about 34 cm in diameter.

FEATURE 64 (Primary Skeleton, Cut E).—This feature consists of a primary extended skeleton located, excavated, and removed in 1973. The skeleton was lying on its back with legs and arms extended. The skull was resting on its left parietal and is located WSW of the postcranial remains. The skull was located at a depth of only 20 cm from the surface. The skeleton measured 1.62 m in length NE–SW and 30 cm in width NW–SE. The skeleton was lying within the shell area and no artifacts were associated.

The skeleton is generally complete. Morphology of the pelvis suggests male sex. The symphyseal face of the pubis shows a complete ventral rampart, but no rim formation, suggesting an age at death between 40 and 50 years.

FEATURES 65, 66, 67, and 68 (Funerary Urns from within and near Cut E).—These four features represent funerary urns that were located in August 1973 on the border of cut E or just outside of it. They were not excavated or removed from the site, thus additional information is not available.

FEATURE 69 (Funerary Urn, Northern and Western Extensions, NW of Square A-3 Main Cut).—This feature represents a large funerary urn with no covering, excavated and removed in August 1973. The urn extended from a depth of 40 cm to a depth of 1.18 m and was covered only with a few sherds. The human skeletal concentration extended from a depth of 50 cm to the bottom of the urn. The urn and the skeletal concentration were somewhat disturbed by a large root from a nearby tree that penetrated the urn. The only possible articulation in this urn was left fourth and fifth metatarsals that were found close together. Many sherds were found within the urn, scattered within the fill. A concentration of shell beads occurred at a depth of about 45 cm. Some of the beads were aligned, indicating they had been strung and piled on top of each other.

This urn was not reconstructed and thus detailed measurements are not available. Field measurements indicate a maximum diameter of about 56 cm and a height of about 78 cm. One hundred thirty-seven beads were recovered from this feature. Of these, 53 are type A, seven are type B, 22 are type D, 53 are type E, and two are type H.

Human remains from this feature weigh 5782 g and represent at least five individuals: two adults and three subadults. As Table A46 shows, the two adults are generally complete. Morphology of the pubis indicates that one is a female older than 50 years, and the other is a female of undetermined age. The subadult remains (Table A98) represent the very incomplete remains of one 15- to 20-year-old male, one infant age 1.5 years, and one infant who died at birth or soon after.

FEATURES 70, 71, 72, 73 (Funerary Urns, Northern and Western Extensions, N and NW of Square A-3, Main Cut).—All of these funerary urns were found in the fall of 1973 and were located in the border of the northern extension. They were not excavated and removed and thus detailed information is not available.

FEATURE 74 (Primary Skeleton, Northern Extension, N of Square A-3, Main Cut).—This feature represents a primary skeleton found during August 1973. The individual was lying on its stomach with the skull SSE of the postcranial skeleton. The skull was resting on its base facing SSE. The skeleton was covered with large, urn size sherds, extending to the surface. Since this feature extended into the northern wall of the northern extension, it was not completely excavated. The skull, mandible, and clavicles were removed for analysis, while the rest of the skeleton remained in situ. Except for the sherd covering, no other artifacts were associated with the cranial area of the skeleton.

The skull is that of a young adult male, probably between the ages of 23 and 28 years.

FEATURE 75 (Funerary Urn, Western Extension, W of Square A-3, Main Cut).—This feature represents a funerary urn located, excavated, and removed in August 1973. The urn extended from about ground surface level down to a depth of 70 cm and was covered only with a few sherds. The urn was not reconstructed; however, field measurements indicate a maximum diameter of about 55 cm and a height of about 70 cm. The urn had a round-pointed base.

A total of 1864 g of human remains was recovered from this feature. The bones represent one adult and two subadults (Tables A47 and A99). The adult is relatively complete. Cranial and pelvic morphology indicates the individual is a 20- to 30-year-old female.

The degree of dental formation in the subadults suggests ages at death between 3 and 4 years for the older individual and birth to six months for the younger.

FEATURE 76 (Secondary Deposit of Human Bones, Western Extension, W of Square A-2, Main Cut).—This feature consists of a concentra-

tion of human bones and a ceramic plate, excavated and removed in August 1973. This feature was located just S of Feature 77, but in a distinct pit. The concentration occurred just above the shell layer at a depth of about 50–60 cm.

The ceramic plate is complete and displays a lip beveled exteriorly, a straight everted rim, and a flat base. There are no appendages and no decorations. The texture of the outside surface is coarse. The inside surface is smooth with a red slip. This red slip extends slightly over the rim to the outside surface. The outside rim surface shows some horizontal smoothing striations that extend down to 17 mm below the lip. Horizontal polishing striations occur on the inside rim and on the base of the plate. Dimensions are as follows: maximum rim diameter, 163 mm; base diameter, 122 mm; height, 30 mm; rim thickness, 5–8 mm; base thickness, 3–8 mm.

The human remains from this feature weigh 1772 g and represent at least two adults and one subadult (Tables A48 and A100). Most of the adult remains show evidence of burning. They are calcined, with the color ranging from gray to white. The bones display no warping and no transverse fractures, indicating they were burned after the flesh had decomposed. Bones that show no evidence of burning are the following: right tibia, right femur, right clavicle, left humerus, left radius, right talus, right calcaneus, a right foot navicular, six ribs, and several cranial fragments. Due to the fragmentary nature of the adult material, estimates of age and sex are not possible.

The subadult bones represent the incomplete remains of probably one individual. The degree of dental formation indicates an age at death of about four years.

FEATURE 77 (Funerary Urn, Western Extension, W of Square A-3, Main Cut).—This feature consists of the lower portion of an urn containing secondary human skeletal material, excavated and removed in August 1973. The urn extended from a depth of 43 cm to a depth of 1.04 m. Diameter of the urn was about 66 cm. The human bone concentration extended from a depth of 91 cm to the bottom of the urn. The pit fill above the skeletal concentration contained a mixture of soil and sherds. All other artifacts were clustered in the extreme bottom of the urn.

Human remains from this feature weigh 1503 g and represent six individuals: at least three adults and three subadults (Tables A49 and A101). The adult remains are very incomplete, with three individuals indicated only by left first metatarsals and right second metatarsals. The concentration lacked adult humeri, radii, and ulnae completely. The remains are too fragmentary to allow reliable estimates of sex or age.

The subadult material is also very fragmentary; however, at least three individuals are represented. The oldest child is represented by one right ulna, several vertebrae, the ischia, and a pubis. The size of the ulna suggests an age of about 7.5 years. A second subadult shows a left femur length of about 140 mm. This and the extent of dental formation suggest an age at death of 1.5 years. The third subadult lacks dentition; however, a right femur length of 115 mm suggests an age at death of about one year.

Artifacts recovered include 11 beads and two round lead objects about 15 mm in diameter with small copper insets (Figure 105). One of the copper insets forms an eye which perhaps was used for attachment. The beads consist of two type D, one type M, and eight type N.

FEATURES 78, 79, and 80 (Funerary Urns, Western Extension, W of Square A-3, Main Cut).—These three features represent funerary urns that were located in August 1973 but were not excavated and removed. No additional information is available.

FEATURE 81 (Partially Disturbed Primary Skeleton, Western Extension, W of Square A-3, Main Cut).—This feature represents a concentration of secondary human skeletal remains clustered around a partially disturbed primary adult skeleton. The primary skeleton was articulated from the skull to the lumbar vertebrae and was lying on its right side above the shell layer. The skull was WSW of the postcranial remains. Just E of the thoracic vertebrae, the bones were disturbed, probably by the excavation of the pit for feature

77. Just S of feature 81 and nearly in contact with it were a ceramic jar, plate, another skull, and concentration of additional human remains, all secondary. The articulated individual is male with a probable age at death of 35 to 45 years, according to pubic morphology.

The extra complete skull is female, with a probable age at death between 20 and 35 years. The additional secondary bones were predominately long bone shaft fragments.

The ceramic jar (Figure 98) is complete and displays a rounded lip, everted rim, concave everted neck, carinated body, and rounded base. There are no appendages, and decoration is confined to a series of punctations extending around the circumference of the neck. The surface texture is smooth and a red slip occurs from the rim down 17 mm on the inside and 100 mm on the outside. Dimensions are as follows: maximum rim diameter, 104 mm; minimum neck diameter, 57 mm; maximum body diameter, 102 mm; maximum height, 115 mm; rim thickness, 5–7 mm; body thickness, 3–5 mm.

FIGURE 98.—Ceramic jar, feature 81.

The ceramic plate is complete except for part of the rim. It displays a rounded lip, straight everted rim, and a flat base. There are no appendages and no decorations. The outside texture is rough; the inside texture is smooth and polished, with a reddish brown slip. Horizontal smoothing striations occur on the outside surface from the rim down 23 mm. Dimensions are as follows: maximum rim diameter, 186 mm; maximum base diameter, 150 mm; rim thickness, 6–8 mm; base thickness, 5–6 mm.

Associations

URNS

Of the 81 features, 54 represent funerary urns. Forty-six of these were located in or near the main cut and eight in or near cut E. Forty-three urns were excavated and removed. Of these, at least 21 were covered with at least one additional urn. As noted on page 96, these figures are minimal since five additional urns were covered with thick sherds that may once have been urn coverings. Depths from the surface to the highest part of the urns or urn coverings ranged from 0 cm to 60 cm with a mean depth of 10.17 cm, n = 36. Maximum depths of the urns ranged from 17 cm to 150 cm with a mean maximum depth of 92 cm, n = 37.

Skeletal Content

Information on skeletal content is not available for two urns. The remaining 41 contained at least 384 individuals, an average of 9.37 persons per urn. The minimum number of individuals present in each urn ranged from 0 to 25. Bone weight within each of the 41 urns varied from 0 grams to 24,380 g and averaged 8422 g (SD = 6801).

Correlation of Urn Size and Skeletal Content

During excavation, it appeared that the size of the urn varied in direct proportion to the amount

of bone contained within. To test this hypothesis, a correlation matrix was constructed with seven variables: (1) number of individuals within the urn as revealed by the skeletal inventory; (2) weight of bone within each urn; (3) height of the urn; (4) urn maximum diameter; (5) an approximation of urn volume, calculated by multiplying urn height by urn diameter; (6) urn rim diameter; and (7) maximum depth of the urn in the ground. Results are presented in Table 19. Only seven of 28 correlations are not significant at the .05 level. The table shows that the number of individuals and weight of bone in the urns are significantly correlated with urn height and volume but not with rim diameter, urn diameter, and depth in the ground. These data suggest either that urns were made or selected to accommodate the quantity of dead to be buried or that deceased individuals or bones were accumulated to the needed quantity for the size of the urn available.

Bone Representation

Individual bone representation varied considerably within each urn (Tables A1–A102). The total numbers of all bones present in all urns are presented in Tables A50 (adults) and A102 (subadults). For adults, maximum counts came from the humerus (147), followed by the temporal (146), femur (145), mandible (134), ulna (128), tibia (125), talus (121), radius (116), scapula (111), clavicle (110), and second cervical vertebrae (110). Relatively few individuals were represented by distal and middle foot phalanges (7), pisiformes (10), and distal hand phalanges.

A similar pattern is seen for subadults, where the maximum count is of femora (140), followed by temporals (133), humeri (111), mandibles (96) and tibiae (88). Very few individuals were represented by patellae (3) and carpals and tarsals (5). This pattern of relative bone representation is similar to that documented from a large secondary ossuary burial in the eastern United States (Ubelaker, 1974) where maximum counts came from adult mandibles, first and second cervical vertebrae, tibiae, tali, and scapulae and from subadult femora, temporals, tibiae, and ilia.

Articulations

Skeletal remains within urns were predominately secondary; however, nearly half of the urns

TABLE 19.—Correlation matrix for seven attributes of urn features (sample sizes in parentheses)

Attributes	*No. of individuals*	*Bone weight*	*Urn height*	*Urn diameter*	*Urn volume*	*Rim diameter*	*Depth in ground*
	1	*2*	*3*	*4*	*5*	*6*	*7*
1	1.00000	0.90799	0.44056	0.33223[b]	0.41446	0.28522[a]	0.23436[a]
	(40)	(40)	(36)	(39)	(36)	(26)	(35)
2	0.90799	1.00000	0.49005	0.24623[a]	0.40410	0.21753[a]	0.26317[a]
	(40)	(40)	(36)	(39)	(36)	(26)	(35)
3	0.44056	0.49005	1.00000	0.78344	0.95188	0.52632	0.69394
	(36)	(36)	(39)	(39)	(39)	(26)	(34)
4	0.33223[b]	0.24623[a]	0.78344	1.00000	0.91507	0.85583	0.56577
	(39)	(39)	(39)	(42)	(39)	(27)	(36)
5	0.41446	0.40410	0.95188	0.91507	1.00000	0.69403	0.66580
	(36)	(36)	(39)	(39)	(39)	(26)	(34)
6	0.28522[a]	0.21753[a]	0.52632	0.85583	0.69403	1.00000	0.29947[a]
	(26)	(26)	(26)	(27)	(26)	(27)	(23)
7	0.23436[a]	0.26317[a]	0.69394	0.56577	0.66580	0.29947[a]	1.00000
	(35)	(35)	(34)	(36)	(34)	(23)	(37)

[a] Not significant at .05 level.
[b] Not significant at .01 level.

did have articulated skeletal parts, usually at the bottom, beneath the disarticulated material. Of 32 urns from which the human remains were carefully removed and examined for articulations, 15 (47 percent) had at least some articulated skeletal parts. As Table 20 reveals, both sexes and all ages are represented in the articulated sample. Of the 18 individuals represented by articulated bones, 11 are adults, one is an adolescent, three are children, and three are infants. Of the 11 adults, six are males, three are females, and sex was not determined for two individuals. Four of the 18 individuals were completely articulated (all children or infants). The remaining 14 were represented by only parts of the skeleton, usually bones of the legs, vertebral column, and feet. Several of the articulations involved bones of the upper leg, lower leg, and/or pelvis without articulation of the vertebrae. This is somewhat unusual since ossuary analysis has shown that vertebral articulations are much more common than either articulations of the femur and innominate or the femur, tibia, and fibula (Ubelaker, 1974:31).

These articulations in the urns could represent ceremonial defleshing, although no cut marks were found on the bones. They could also be produced if the lower half of the body was tightly bound and decomposition was allowed to proceed normally before burial. Of course, they reflect those individuals who died soon before urn burial, in contrast to those represented by secondary remains of persons who died long enough before urn burial to allow the flesh to decompose and the bones to become disarticulated.

TABLE 20.—Characteristics of articulated skeletons within urn features

Feature	*Age (yrs)*	*Sex*	*Parts articulated*
6	70–75	M	legs, feet
11	20+	F	legs, feet
17	20+	M	pelvis, legs, feet, lower arms
17	2–8	–	ribs and vertebrae
20	5–6	–	complete
23	20–35	–	vertebrae
22	20+	–	foot, vertebrae
24	35–40	M	pelvis, legs, feet, vertebrae
26	35–40	M	vertebrae, pelvis, legs, feet
30	33–38	F	left innominate-femur
30	0–2	–	complete
30	10–14	–	vertebrae, left femur, innominate, foot
50	37–41	F	vertebrae, pelvis, legs
51	20+	M	foot
52	12–14	–	lower arms, pelvis, legs, feet
57	1–2	–	complete
59	35	M	left lower leg
62	2	–	complete

Burned Bones

Fourteen urn features contained burned bones. In six of these, several bones showed charring on a limited area of the bone surface and other indications that the burning had occurred after flesh decomposition but before burial in the urn. Most of these were adult bones, although a subadult left femur and occipital from feature 26 also displayed charring.

In the remaining nine features, the burned bones were calcined, warped, and displayed the fracture pattern characteristic of bone that has been burned with flesh still attached. All parts of the skeleton and both adults and subadults are represented by this type of burned bone.

Mortuary Procedure

Little additional information is available on details of the mortuary procedure that culminated in urn burial. The secondary nature of most of the skeletons suggests the mortuary ritual included a primary repository, although it cannot be determined if it was above or below ground. Bones from many of the urns display rodent tooth marks, but these were probably produced by burrowing rodents that nested in the urns. The presence of calcined, warped bone fragments in many of the urns indicates that the mortuary procedure included cremation for at least some individuals. Indications of more intense firing on the dorsal sides of some bones may suggest bodies were cremated with the dorsal body surface exposed to the crematory fire, e.g., the body may

have been placed on its back on top of the crematory fire.

The presence of human bone trapped between the urn covering and lower urn in features 26 and 30 may indicate that the bones were carried to the feature, using the urn covering as a container. No other features, however, showed bones in this position.

The cultural/biological unit represented by the urn burial also remains unclear. The distribution of ages within many of the urns suggest a single extended family could be represented by each urn. Several of the urns however contained only a very few individuals of restricted age groups. In addition the articulated remains representing those who were most recently deceased before burial include both sexes and all age groups rather than members of a single status group, whose deaths might have initiated the urn burial of all family members previously deceased. The urn burials may represent a time element, e.g., a mortuary procedure where all dead were buried together after a fixed period of time. Without additional data, the exact meaning of the urns and, consequently, the details of the mortuary procedure remain elusive.

Non-Urns

The non-urn features also show great variability.

The 27 non-urn features consist of single primary burials (13), primary burials with associated articulated infants (2), primary burials with associated secondary deposits of skeletal material (8), primary skeletons with undetermined skeletal associations (2), and isolated secondary skeletal deposits (2).

Primary Skeletons

Of the 81 features identified from this site, 25 (31 percent) represent primary skeletons. These were recovered from the main cut and cut E. Measurements of depth from the surface are available for 22 primary skeletons. These range from 20 cm to 1.10 m and average 64 cm. Males (n = 9) average 69 cm in depth, females (n = 8), 66 cm, and subadults (n = 5), 52 cm.

Deposition.—Of the 22 primary skeletons with information on deposition, 10 (45 percent) were on their backs, three (14 percent) were lying face down and nine (41 percent) were on their right sides. Of the 11 males, four (36 percent) were on their backs, one was on its face, and six (55 percent) were on their right sides. Five (63 percent) of the eight females were on their backs, one (13 percent) on its face and one on its right side. Information on deposition is available for only three subadults. Depositions were on back, face, and right side.

Position.—Information on position is available for 21 primary skeletons (10 males, eight females, and three subadults) and shows the appendages were predominately extended. Of 15 observations of lower leg position, 13 (87 percent) were extended, and two were semiflexed (155°). Of 18 observations of upper legs, 16 (89 percent) were extended and two were semiflexed. Of 19 lower arm observations, 15 (79 percent) were extended and four were semiflexed. All 21 upper arm positions were extended. The semiflexed positions occurred in both age and sex groups.

Orientation.—Observations on skull orientation were recorded for 23 primary skeletons. In 20 (87 percent) of these, the skull was WSW of the postcranial skeleton. Other orientations were NE (one female), SW (one male) and SSE (one male).

Associated Skeletons.—Two primary burials were associated with articulated infants. Remains of two infants (one partially articulated) were found near the right femur of an adult female. An articulated infant ten months of age was found near the right femur of an adult male. Ages of both adults were estimated to be in the fourth decade.

Eight primary skeletons were found with associated secondary skeletal remains. The primary skeletons consist of six adults, one child (8–9 years), and one infant (10 months). The six adults consist of four males and two females. Both fe-

males are of age 20–30 years and were found with infants concentrated in the upper leg area. One 53-year-old adult male and one eight- to nine-year-old child were each found with remains of two infants concentrated in the left upper leg area. Two additional adult males were found with isolated adult skulls and one adult male was found with secondary remains of one adult and seven subadults. Finally, a ten-month-old primary infant skeleton was found with a few skeletal parts of a young infant and an adult.

Secondary Deposits

Two non-urn features represent secondary skeletal deposits. Feature 12 contained incomplete remains of two adults located beneath a large concentration of pottery. Feature 76 contained burned remains of two adults and one four year old child concentrated with a ceramic plate.

Burned Bones

Four of the non-urn features have some burned bones. The adult male of feature 37C represents the only primary skeleton with evidence of burning. It shows slight charring on the left femoral head. The morphology of the charring as well as the presence of oxidized soil and ash nearby suggests the burning occurred after the skeleton was buried. Material recovered from three other non-urn features, as well as additional material from feature 37, display evidence of burning. Features 28 and 41 contain charred (black) fragments while features 37 and 76 contain some calcined (white) material. Calcined remains from feature 37 include subadult ribs, long bone shafts, and vertebrae that display warping and fracture patterns suggesting the bones were cremated in the flesh. Bones from feature 76 are also calcined, but display fracture patterns suggesting they were burned as dry bones.

Mortuary Procedure

In summary, the non-urn features present evidence for a complex and varied mortuary procedure. Some individuals were buried in an extended position soon after death with infants sometimes placed near the leg or hip area. Some of these infants had recently deceased; others had been dead long enough for the flesh to decompose. Isolated skulls or groups of bones were placed with some individuals or buried in separate pits. Some individuals had been burned, before or after flesh decomposition.

Artifacts

Beads

A total of 6003 perforated beads were recovered from the features. Of these the following 16 types were distinguished. Diameter measurements are taken perpendicular to the axis of the perforation. Length measurements are taken parallel to the axis of the perforation.

A. Oyster shell (*Ostrea* sp.). Minimally worked with irregular perforations (1 or 2) through center; diameter, 13 to 57 mm; perforation diameter, 1.5 to 6 mm.

B. *Argopecten circularis.* Minimally worked fan-shaped shell with single centrally located perforations; color, off-white; diameter, 15 to 35 mm; perforation diameter, 1.3 to 6 mm.

C. *Protothaca asperrima.* Minimally worked fan-shaped shell with a single, irregular, centrally located perforation; color, off-white; diameter, 28 to 31 mm; perforation diameter, 6.7 to 8.4 mm.

D. Rounded, cut from shell. Color varies from white to off-white; texture varies from chalky with irregular pits to smooth, nearly polished; diameter, 2 to 13 mm; length, 0.5 to 7 mm; perforation diameter, 1 to 2 mm.

E. Irregular shape, cut from shell. Harder than type D with "stonelike" appearance; color, off-white; diameter, 4 to 9 mm; length, 1 to 6 mm; perforation diameter, 1 to 3 mm.

F. Solid color, cut from shell. Bright, solid colors including red, orange, lavender, pink, yellow, and black; well defined borders with central perforations; diameter, 2 to 8 mm; length, 0.5 to 9 mm; perforation diameter, 0.6 to 2 mm.

G. Mixed color, cut from shell. Each shows

one dominant color with irregular areas of color variation; dominant colors include red, orange, pink, lavender, and purple; most are symmetrical with sharp borders, although some are irregular; diameter, 2 to 8 mm; length, 1 to 8 mm; perforation diameter, 1 to 4 mm.

H. Roughly worked off-white shells. Single perforation located off-center; some retain grooves and other markings of the original shell morphology; diameter, 7 to 18 mm; length, 2 to 4.5 mm; perforation diameter, 1 to 2.5 mm.

I. Irregular, cut from mother-of-pearl. Irregular shaped; color, white with the multi-colored sheen characteristic of mother-of-pearl; one or two perforations; diameter, 5 to 10 mm; length, 0.5 to 2 mm; perforation diameter, 1 to 2 mm.

J. Ceramic discs. Color, black with a granular appearance; produced by molding a mixture of clay and fine quartz particles around a shaft. Irregularity of one side concave, the other convex, produced by premature removal from shaft (Clifford Evans, pers. comm.); diameter, 4 to 5 mm; length, 1 to 3 mm; perforation diameter, 1 to 1.5 mm.

K. Cut from schist. Color, blue-green; diameter, 12 mm; length, 6 mm; perforation diameter 2.5 mm.

L. Cut from calcite. Color, blue-green; diameter, 2.5 to 3.5 mm; length, 1 to 1.5 mm; perforation diameter, 0.5 to 1 mm.

M. Cut from fluorite. Cylindrical and dark blue; diameter, 6.8 mm; length 12.2 mm; perforation diameter, 3 mm.

N. European manufactured glass wire-wound beads. The beads are doughnut shaped and correspond with Kidd and Kidd's (1970:62) type Wld3. Color varies from opaque blue-green to dark blue; diameter, 8.9 to 11.1 mm; length, 4 to 6 mm; perforation diameter, 2 to 3.4 mm. In each bead, the perforation diameter tapers, indicating that the bead was formed around a tapering wire.

O. *Leptoperten* sp. Minimally worked fan-shaped shell with single, centrally located perforation. Color, gray-white; diameter, 30 to 31 mm; perforation diameter, 6 mm.

P. Ceramic cylindrical. Cylindrical shaped, black-maroon in color; spectrographic analysis revealed a clay matrix containing a large concentration of quartz particles; diameter, 3 to 4 mm; length, 2 to 2.5 mm; perforation diameter, 1 to 1.5 mm.

Note that most bead types are made of local shells that were readily available. Only one feature contained European beads.

Frequencies of each type with urn, primary and secondary features are summarized in Table 21. Note that most beads (85 percent) came from urns. Nine of the bead types (B, C, E, H, J, L, M, N, O) were found exclusively within urns, while only two types (D, K) were found only with primary skeletons. As Table 22 shows, beads with

TABLE 21.—Frequency of each bead type associated with urn, primary, and secondary features

Bead type	*Urn*	*Primary*	*Secondary*	*Total*
A	452	1		453
B	29			29
C	1	–		1
D	3283	729	1	4013
E	140			140
F	346	95		441
G	642	7		649
H	15			15
I	6	1		7
J	150			150
K	–	1		1
L	18			18
M	1			1
N	8			8
O	1			1
P	–	76		76
Total	5092	910	1	6003

TABLE 22.—Distribution of bead types within primary burials by sex and by age

Individual type	A	D	F	G	I	K	P	*Total*
Adult males	1	194	29	3	–	1		228
Adult females	–	340	28	3	1		76	448
Subadults	–	195	38	1	–	–		233
Total	1	729	95	7	1	1	76	909

primary skeletons were found with individuals of both sexes and all ages.

Ceramics

Urns

Fifty-four (68 percent) of 80 features recognized at this site are ceramic urns, sometimes covered with inverted urns. The lower upright urns average about 74 cm in height, with a maximum diameter of about 64 cm and a rim diameter of 44 cm. Body thickness averages 14 mm and rim thickness 20 mm. The dimension measurements are summarized in Table 23. All upright urns lack appendages, and decoration is confined to a red slip present on five (31 percent) of the 16 urns on which such observations were taken.

Lip form is predominately beveled interiorly (17 urns, 68 percent), with four rounded (16 percent) and four flat (16 percent).

Rim form includes everted (9 urns, 53 percent), direct (6 urns, 35 percent), and interiorly thickened (2 urns, 12 percent).

Neck outlines are either straight (16 urns, 56 percent) or concave (9 urns, 36 percent). The angle of the neck is mainly everted (15 urns, 60 percent), with eight inverted (32 percent) and two parallel (8 percent).

Base form is predominately a "nipple-shaped" rounded point (24 urns, 83 percent) with three (10 percent) flat, and two (7 percent) rounded.

Urn Coverings

Of the 43 excavated urns, at least 21 (49 percent) were covered with an additional urn, usually inverted. This figure is minimal, since an additional five urns were covered with thick sherds that may once have been urn coverings. In addition several more of the uncovered urns extended to ground surface, thus coverings may once have been present, but were lost as the surface lowered with erosion.

Since the coverings are usually incomplete and fragmentary, few were reconstructed. Table 24 summarizes the dimensions of the urns. The averages are very similar to those for the upright urns.

Base form could be observed on only five. All show the "nipple-shaped" rounded point.

Only two coverings are sufficiently complete to allow accurate rim examinations. These two show one rounded lip and one lip beveled interiorly; one straight everted neck and one concave everted neck.

A red slip was observed on only one urn covering.

Jars

Twenty-six jars were recovered from 25 features, of which 11 were urns (44 percent), 13 were primary skeletons (52 percent), and one was a secondary skeletal deposit (4 percent). Of the 13 primary skeletons, eight (62 percent) are males, three (23 percent) are females, and two (15 percent) are of undetermined sex. Eleven of the primary skeletons are adults and two are subadults.

Tables 25 through 32 summarize morphology and dimensions for the jars. The traits occurring with greatest frequency are rounded lip (76 percent), everted rim (83 percent), concave everted neck (83 percent), and rounded base (81 percent).

Table 23.—Dimensions of upright urns

Dimension	*No.*	*Mean*	*SD*	*Range*
Vessel height (cm)	38	74	18	37–105
Vessel diameter (cm)	41	64	11	37–86
Rim diameter (cm)	27	43	8	26–60
Body thickness (mm)	16	14	4	5–22
Rim thickness (mm)	14	20	6	7–35

Table 24.—Dimensions of urn coverings

Dimension	*No.*	*Mean*	*SD*	*Range*
Vessel height (cm)	4	70	14	55–84
Vessel diameter (cm)	11	65	7	53–74
Rim diameter (cm)	2	51	10	44–58
Body thickness (mm)	4	11	5	5–17
Rim thickness (mm)	2	21	1	19–22

TABLE 25.—Variation in lip form of all jars by feature type (no. = observations)

Feature type	Rounded		Beveled interiorly		Tapered		Flat		
	No.	%	No.	%	No.	%	No.	%	Total
Urn	5	46	4	36	1	9	1	9	11
Primary	12	100	0	0	0	0	0	0	12
Secondary	2	100	0	0	0	0	0	0	2
Total	19	76	4	16	1	4	1	4	25

TABLE 26.—Variation in rim form of all jars by feature type (no. = observations)

Feature type	Everted		Interiorly thickened		Direct		Exteriorly thickened		
	No.	%	No.	%	No.	%	No.	%	Total
Urn	8	73	2	18	1	9	0	0	11
Primary	10	91	0	0	0	0	1	9	11
Secondary	2	100	0	0	0	0	0	0	2
Total	20	83	2	8	1	4	1	4	24

TABLE 27.—Variation in neck form of all jars by feature type (no. = observations)

Feature type	Concave everted		Straight everted		
	No.	%	No.	%	Total
Urn	9	82	2	18	11
Primary	10	91	1	9	11
Secondary	2	100	0	0	2
Total	21	87	3	13	24

TABLE 28.—Variation in base form of all jars by feature type (no. = observations)

Feature type	Rounded		Annular		Flat		
	No.	%	No.	%	No.	%	Total
Urn	8	80	2	20	0	0	10
Primary	9	82	1	9	1	9	11
Total	17	81	3	14	1	5	21

TABLE 29.—Carinations on all jars by feature type (no. = observations)

Feature type	Absent		Single		Double		
	No.	%	No.	%	No.	%	Total
Urn	6	60	2	20	2	20	10
Primary	4	36	7	64	0	0	11
Secondary	1	100	0	0	0	0	1
Total	11	50	9	41	2	9	22

TABLE 30.—Frequency of jars with red and/or white slip by feature type (no. = observations)

Feature type	Absent		Red		Red and white		
	No.	%	No.	%	No.	%	Total
Urn	3	27	7	64	1	9	11
Primary	0	0	9	100	0	0	9
Secondary	1	50	1	50	0	0	2
Total	4	18	17	77	1	5	22

TABLE 31.—Decoration variation of all jars by feature type

Feature type	No. of punctation lines			Clay addition	Incised line	Raised line	
	One	Two	Four				Total
Urn	2	2	1	1	0	1	12
Primary	8	0	0	0	0	0	10
Secondary	0	0	0	0	1	0	1
Total	10	2	1	1	1	1	23

On some jars it was not possible to make an observation relative to each trait. In some cases a single jar yielded more than one observation for a given trait.

Carinations are present on 52 percent of the jars. On two jars (10 percent) within urns, double carinations occur.

A red slip occurs on 17 jars (77 percent) and a red and white slip on one. Slip is definitely absent from only four (18 percent).

Seventy percent of the jars show decorations.

TABLE 32.—Dimensions (mm) of all jars by feature type (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Rim thickness				
Urn	10	7	2	3–11
Primary	11	7	1	3–10
Secondary	2	8	2	5–12
Body thickness				
Urn	6	6	1	4–10
Primary	6	5	2	3–10
Secondary	0	0	0	0
Rim diameter				
Urn	11	134	69	77–305
Primary	11	129	40	80–182
Secondary	2	172	58	131–213
Maximum diameter				
Urn	10	169	100	92–440
Primary	11	149	41	85–202
Secondary	0	0	0	0
Height				
Urn	10	197	105	115–480
Primary	11	182	50	115–270
Secondary	0	0	0	0

The usual decoration is one, two, or four rows of circular punctations extending around the rim or body of the vessel. Additional forms of decoration include clay addition, incised lines, and a raised line on the rim.

Morphological differences between jars found within urns and those with other features are minimal. Jars within urns showed greater diversity in lip form, rim form and on the average are larger than those from primary or secondary skeletons; however, these differences are extremely minimal and probably of little cultural significance. Note that the fragments of jars found with secondary skeleton features include neither base nor body.

Compoteras

Nineteen compoteras were found with 18 features: 10 urns and eight primary skeletons (two compoteras occurred in one urn). Of the eight primary skeletons, four (50 percent) are males, two (25 percent) are females, and two (25 percent) are of undetermined sex. The primary skeletons represent six adults, one subadult, and one of undetermined age (not completely excavated).

Tables 33 through 37 present detailed morphological and metric data for the compoteras. As with the jars, it was possible in some cases to make more than one observation on a compotera for a given trait; in others no observation for a specific trait could be made. Note the consistent similarity between compoteras from the urns and those from features of primary skeletons. The only differences are in base diameter and height, where compoteras from features with primary skeletons are larger. The compoteras most commonly display a lip beveled interiorly (58 percent), concave everted rim, and carinated plate (68 percent).

TABLE 33.—Variation in lip form of compotera plates (no. = observations)

Feature type	*Beveled interiorly*		*Flat*		*Tapered*		*Rounded*		
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*Total*
Urn	7	64	1	9	1	9	2	18	11
Primary	4	50	3	38	0	0	1	13	8
Total	11	58	4	21	1	5	3	16	19

TABLE 34.—Frequency of carinations on compoteras (no. = observations)

	Present		*Absent*		
Feature type	*No.*	*%*	*No.*	*%*	*Total*
Urn	7	64	4	36	11
Primary	6	75	2	25	8
Total	13	68	6	32	19

TABLE 35.—Frequency of red slip on compotera plates (no. = observations)

Feature type	*Present*		*Absent*		
	No.	*%*	*No.*	*%*	*Total*
Urn	4	36	7	64	11
Primary	4	50	4	50	8
Total	8	42	11	58	19

Ten compoteras (53 percent) display decorations, which include combed, incised, and painted designs as well as indentations around the rim.

TABLE 36.—Variation in decoration of compotera plates (no. = observations)

Feature type	*None*		*Combed*		*Incised*		*Painted*		*Indentations*		
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*Total*
Urn	4	36	1	9	4	36	1	9	1	9	11
Primary	5	63	2	25	1	13	0	0	0	0	8
Total	9	47	3	16	5	26	1	5	1	5	19

TABLE 37.—Dimensions (mm) of compoteras (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Plate diameter				
Urn	11	183	26	141–221
Primary	8	174	44	105–232
Diameter at junction				
Urn	8	64	17	40–90
Primary	6	60	17	34–85
Base diameter				
Urn	4	142	17	121–163
Primary	2	195	19	181–208
Total height				
Urn	4	112	24	80–137
Primary	2	266	17	254–278
Plate thickness				
Urn	8	6	2	4–9
Primary	4	9	2	6–10

Plates

Five ceramic plates (complete, not from compoteras) were found associated with four primary and one secondary skeleton. The primary skeletons represent at least two males and one female: three adults and one subadult. Lip form is rounded and rim form, straight everted. No carinations were noted. Three plates display a red slip and one lacks a slip. Mean plate diameter is 200 mm with a range from 186 to 215 mm. Plate height ranges from 37 to 88 mm with an average of 63 mm.

Spindle Whorls

Six spindle whorls were recovered from six features: five urns and one male adult primary skeleton. They range in length from 8 to 24 mm and in diameter from 16 to 20 mm. Perforation diameters range from 3 to 6 mm. Three of the spindle whorls display incised decorations. One associated with a primary skeleton shows a pattern of lines and circles, while the two from urns display zoomorphic figures (Figure 99).

Additional ceramic artifacts include eight ceramic discs associated with four urns and one primary adult male. Four of these discs have circular, centrally located perforations. The discs range in diameter from about 20 to about 40 mm.

The miniature ceramic compotera found within the urn feature 17 is complete and displays an irregular lip and rim and a straight everted rim. The modeled body lacks a carination and the base is concave. There are no appendages and no decorations. The texture is coarse, the color is

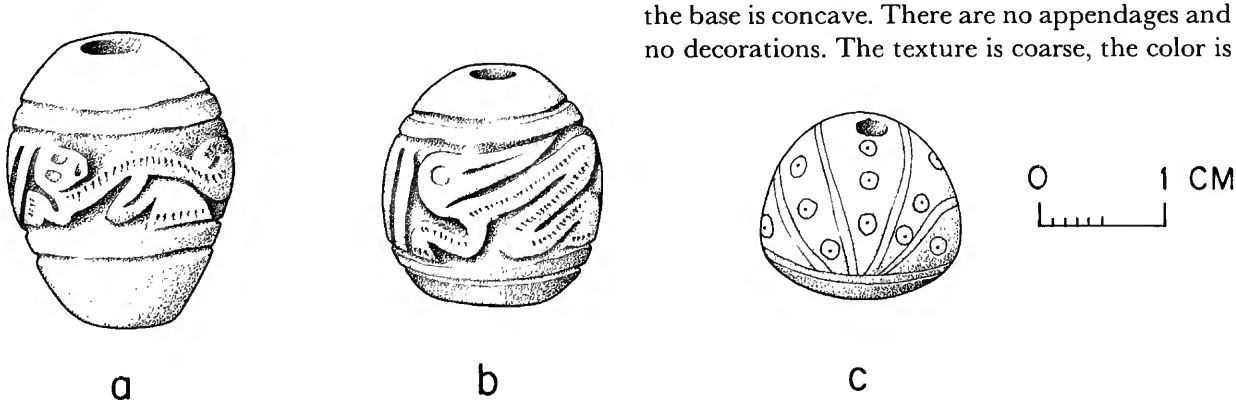

FIGURE 99.—Decorations on spindle whorls: *a*, feature 6; *b*, feature 17; *c*, feature 37C.

FIGURE 100.—Anthropomorphic figurine from feature 46.

gray, and dimensions are as follows: rim diameter, 38 mm; minimum diameter of pedestal, 21 mm; base diameter, 38 mm; vessel height, 43 mm; plate height, 10 mm; rim thickness, 7 mm; base thickness, 4–6 mm.

The final ceramic artifacts consist of one complete and one fragmentary figurine. The complete specimen was probably associated with feature 46, an adult male primary skeleton. The figurine shows an anthropomorphic figure with pronounced female breasts and genitals (Figure 100). The specimen measures 94 mm in height, 66 mm in width (hand to hand) with a chest depth of 28 mm.

The figurine fragment was found within an urn and consists only of the waist and upper leg area of a human figure. Both specimens are modeled with a coarse texture.

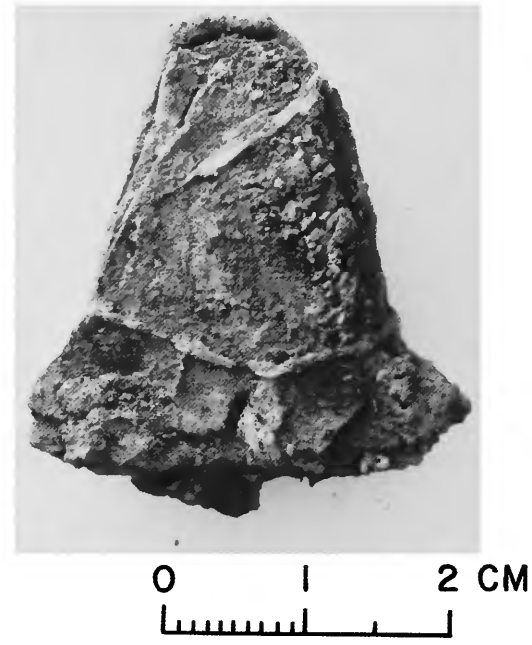

FIGURE 101.—Group of copper plates bound with cotton yarn from feature 42.

METAL AND STONE

Copper Plates

The most frequent metal artifacts from this site consist of groups of small triangular copper plates, frequently bound together by yarn tied around the base in the manner shown in Figure 101. Of the 69 groups recovered, 28 (41 percent) display the yarn binding and/or associated fabric. Analysis of the yarn content by the FBI Laboratories revealed brown single-ply yarns, one with a "Z" twist and all others with an "S" twist. All specimens examined microscopically appear to be cotton.

A total of 69 groups of plates were recovered from eight features within the cemetery. The groups contained a minimal total of 778 individual plates, for an average of 11.3 plates per group. Since decomposition had destroyed many plates, these figures are minimal. Exact plate counts were possible for only seven groups, each of which contained 5, 10, 10, 20, 20, 20, and 20 plates.

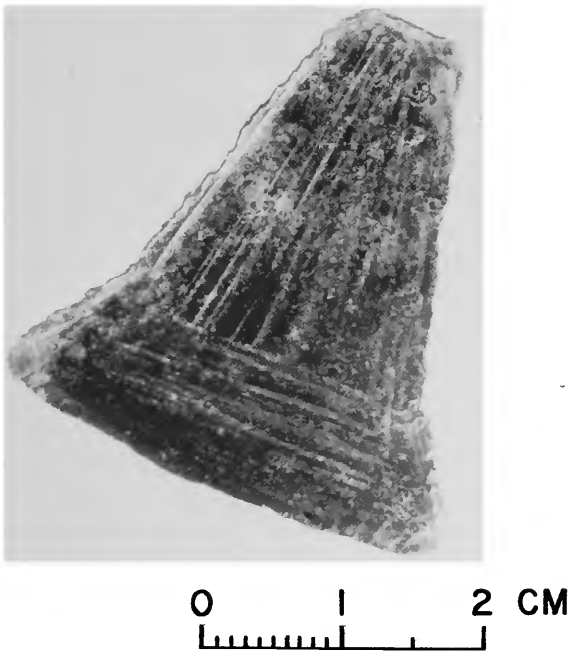

FIGURE 102.—Striations on copper plate from feature 9.

FIGURE 103.—Large copper plate, feature 49.

Individual plate dimensions are summarized in Table 38.

Plate groups were found with urns (2 features), primary skeletons (6 features), and one secondary skeletal deposit. Within the urns the plates were usually concentrated in the base. With the primary skeletons, plates were recovered from four males and two females and from nearly all parts of the skeleton (feet, legs, pelvis, arms, skull, etc.). Plates were also found with one secondary human bone deposit associated with one of the primary skeletons.

Most of the well preserved plates display the pattern of striations shown in Figure 102. Analysis of the plates by energy dispersive x-ray spectroscopy (FBI Laboratories) reveals a predominately copper content.

In the past, these plates have usually been described as "axe-money" suggesting they were used as a medium of exchange. According to Meggers and Evans (1969:138), this interpretation is based upon ethnographic analogy with similar specimens from Mexico. Although not proven, this interpretation is supported by the fact that those plate groups sufficiently intact to allow accurate counts of individual plates revealed totals of 5, 10, or 20.

Single, large copper plates (Figure 103) were recovered from two features: one urn and one primary skeleton. The urn contained one specimen while three were recovered with the primary skeleton, from the right hand and both elbows. The primary skeleton is an adult male, age 25–30.

TABLE 38.—Dimensions (mm) of individual small triangular copper plates from all features (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Length	117	34.3	4.2	21.0–42.0
Width	117	30.9	4.2	16.0–37.0
Thickness	102	0.5	0.2	0.2–1.0

Energy dispersive x-ray spectroscopy analysis of one of these plates reveals a predominately copper content. Dimensions of the plates are summarized in Table 39.

TABLE 39.—Dimensions (mm) of large axe-shaped copper plates from all features (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Length	4	68.0	26.7	44.0–94.0
Width	4	62.3	21.7	43.0–82.0
Thickness	4	2.0	1.1	0.5–3.0

Rings

Metal rings from these features represent a variety of shape (Figure 104), content, and method of manufacture. The most common shape is the thin single ring (Figure 104*a*). Fifty-one of these were recovered from 15 features: 10 urns and 5 primary skeletons. Within eight of the ten urns, the rings were found in the base in no obvious association with the skeletal remains. Within two of the urns, rings were found on crania of articulated skeletons. One ring was found in the ear region of an adult female, about 39 years of age, within feature 50. Three rings were found in the ear region (one left, two right) of a two-year-old infant, within feature 62.

Thirteen rings were associated with five features of primary adult skeletons: four females and one male. The male skeleton displayed a ring in the nose area. One female skeleton also displayed a ring in the nose area; however, all other rings with female skeletons were in place near the ears. The quantity of rings worn on the ears varied to include one at each ear (feature 48), two at the right ear and none at the left (feature 42), and three at each ear (feature 32). Thus both males and females occasionally wore the rings on the nose but only females and the infant (sex unknown) wore them on the ears.

Energy dispersive x-ray spectroscopic analysis of one of these rings revealed a thin (<100 μm) layer of gold over a solid copper interior. Many of the specimens show only copper. In these cases, the gold may have eroded away or was never present.

Dimensions of these rings are summarized in Table 40.

Six thicker single rings of the type shown in Figure 104*b* were recovered from five features. Four of the rings are from urns in no apparent association with skeletal remains. One of the urns with a ring of this type contained mostly the secondary skeleton of a child. The remaining two rings were associated with a secondary bone deposit representing a 20- to 25-year-old female (feature 37A) and the primary skeleton of a 20- to 25-year-old female (feature 42). In the latter, the ring was found in the right eye orbit, where it probably had shifted from its position on the nose. Thus these rings were at least worn on the nose of young adult women and the child.

All of the rings are basically composed of copper, in various stages of preservation. In two of the rings, the copper is covered with a thin layer of gold. Gold could also have once been present on the other rings. Dimensions of these rings are summarized in Table 41.

Three rings of the type shown in Figure 104*c* were found with three features: two urns and one primary adult male skeleton. The ring associated with the adult male was found in the right ear region. Those rings found within urns could not be associated with any particular individual.

TABLE 40.—Dimensions (mm) of single thin rings as shown in Figure 104*a* (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Diameter	44	14.8	2.0	11.0–20.0
Thickness	44	1.8	0.4	0.9–2.7

TABLE 41.—Dimensions (mm) of single thick rings as shown in Figure 104*b* (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Diameter	6	15.2	1.5	14.0–18.0
Thickness	6	4.2	0.8	3.0–5.4

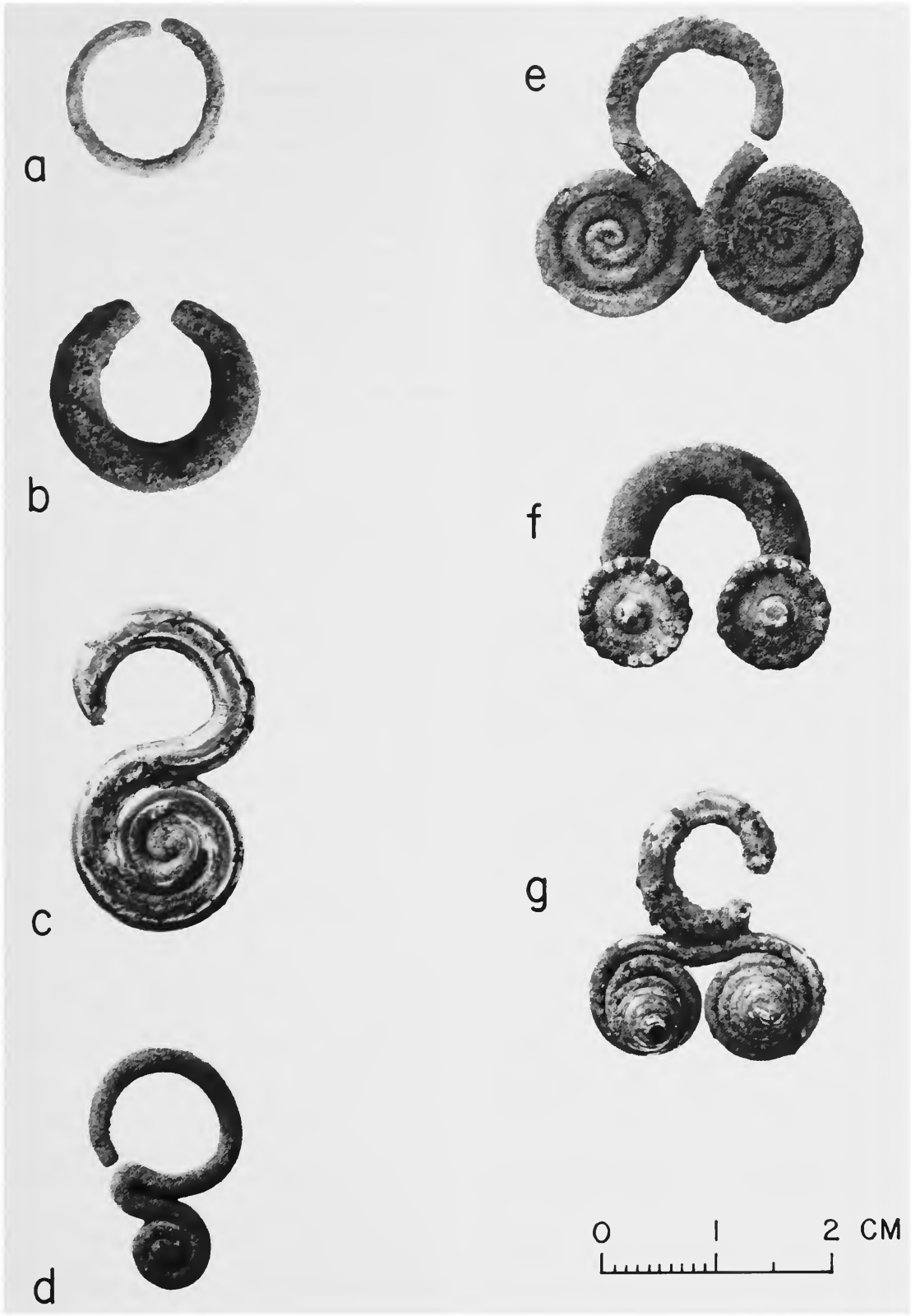

FIGURE 104.—Variations in metal ring shape.

Composition of the ring associated with the adult male (feature 43) was examined in detail. The surface was scratched to a depth of between 100 and 200 μm. A secondary electron image produced by scanning electron microscopy within the scratch revealed that the surface layer is only about 60 μm thick. Energy dispersive x-ray spectroscopic analysis of the scratch surface within the outer layer reveals a composition of mostly gold with minor amounts of copper and silver. Analysis of the deepest part of the scratch reveals a composition of nearly pure copper. This specimen and the ring from feature 4 are made from a single copper wire coated with gold. The third specimen (feature 51) is flat and apparently made from an alloy of gold and silver. Dimensions of these rings are summarized in Table 42.

Rings of the type shown in Figure 104*d* number 12. They were all found within feature 2 (an urn) in no obvious association with any particular individual. These specimens were not analyzed quantitatively, but they appear to have been made from a single copper wire. No gold coating is visible. Dimensions are summarized in Table 43.

Five rings of the type shown in Figure 104*e* were found within four urns (features 2, 25, 51, and 56) in no obvious association with any particular individual. Specimens from features 25, 51, and 56 are made from a single strand of copper wire coated with gold. The fragmentary specimen from feature 2 is very flat and lacks the luster of the other specimens. Energy dispersive x-ray spectroscopic analysis of the surface and internal structure reveals a uniform composition of gold and silver with minor amounts of copper. Dimensions of these artifacts are presented in Table 44.

Four rings of the type shown in Figure 104*f* were found within four urns (features 22, 25, 30, and 52) in no apparent association with a particular individual. Each of these rings consists of two flat discs attached to a single ring of the types shown in Figure 104*a* (feature 52) and Figure 104*b* (features 22, 25, and 30). Energy dispersive x-ray spectroscopic analysis of the ornament from feature 30 revealed that the wire and discs are composed of a layer of predominantly gold, with some silver, over nearly pure copper. Analysis at the point of attachment of the discs revealed the presence of lead in addition to gold, silver, and copper. Although the exact composition of the soldering agent can not be determined, it certainly contains a high proportion of lead, since that element is absent from other areas of the artifact. Dimensions are presented in Table 45.

Only one specimen of the type presented in Figure 104*g* was found. It occurred in feature 30,

TABLE 42.—Dimensions (mm) of coiled rings of the type shown in Figure 104*c* (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Length	3	28.3	6.5	22.0–35.0
Width	3	19.0	1.7	17.0–20.0
Thickness	3	3.5	2.7	0.6–6.0

TABLE 43.—Dimensions (mm) of coiled rings of the type shown in Figure 104*d* (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Length	12	21.2	0.6	20.0–22.0
Width	12	13.9	2.8	11.0–22.0
Thickness	12	2.1	0.1	1.9–2.4

TABLE 44.—Dimensions (mm) of coiled rings of the type shown in Figure 104*e* (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Length	1	21.0	0.0	21.0–21.0
Total width	2	34.5	7.8	29.0–40.0
Coil thickness	8	1.3	0.8	0.4–2.7
Coil diameter	8	14.0	3.6	11.0–20.0

TABLE 45.—Dimensions (mm) of rings with attached disks as shown in Figure 104*f* (no. = observations)

Dimension	*No.*	*Mean*	*SD*	*Range*
Central ring diameter	2	18.0	1.4	17.0–19.0
Central ring thickness	2	4.8	0.4	4.5–5.0
Disc diameter	6	11.3	1.2	10.0–13.0
Disc thickness	6	2.7	0.4	2.1–3.0

in no obvious association with a particular individual. The specimen consists of a double coiled single wire (similar to the type shown in Figure 104*e*) attached to a semi-circular wire (similar to the type shown in Figure 104*b*). Both wires are gold laminated, probably over copper. The entire specimen measures 24 mm in length and 21 mm in width. The coiled section is made from a single wire 1.9–2.0 mm thick. The coils are stacked so that the depth of each is 10.7 and 12.5 mm. The semi-circular wire attachment is 13 mm in diameter and made from a single wire 3.1–3.4 mm thick.

Miscellaneous Metal

Additional metal artifacts include fragments from three pairs of copper tweezers from two urns (features 2 and 31) and one primary skeleton (feature 19). One fragment, 31 mm long, from feature 2, has an estimated original width of 11 mm and thickness of 1 mm. A complete half from feature 19 measures 60 mm long, 13 mm wide, and 1.5 mm thick. The third fragment is 8.5 mm wide and 1 mm thick.

An unidentified flat triangular piece of copper measures 60 mm long, 13 mm wide at the base, and 3 mm thick.

Three copper wires were found together in feature 25 (an urn). The wires are twisted, rectangular in cross-section, 1 to 2 mm thick and display lengths of 60, 69, and 98 mm. Two cone shaped, hollow, rolled copper "dangles" were found nearby. One of these displays a 1 mm oblong perforation at the narrow end. They measure 17 mm in length with widths tapering from 7 to 3 mm.

The final metal artifacts consist of two heavy spheres (Figure 105), 15.5 and 14.3 mm in diameter, found within an urn, feature 77. A single metal loop extends from the surface of each. In addition 14 and six circular metal inserts are visible on the surface of each respective artifact. Energy dispersive x-ray spectroscopic analysis revealed that the matrix is predominantly lead while the metal loops and inserts are predominantly copper with some gold.

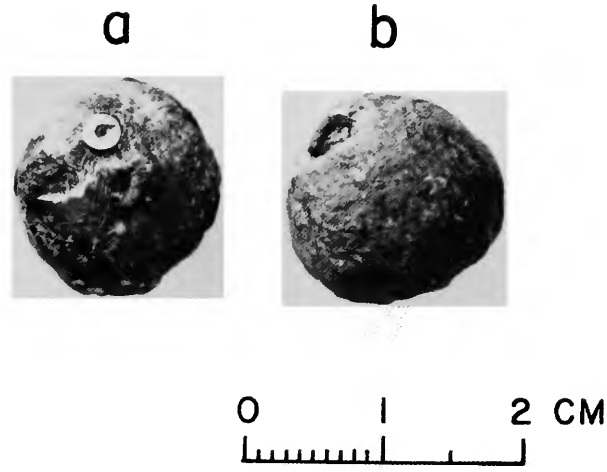

FIGURE 105.—Lead spheres with copper inserts from feature 77.

Lithic Material

According to field notes 16 manos were recovered from four urns and one feature of isolated secondary bone. Seven metate fragments were found with three urns and one secondary skeletal deposit. Early field notes also indicate two "atlatls" (hooks) were found in one urn and with one primary adult male skeleton.

Worked obsidian fragments were found with five features: three urns, one primary adult male, and one primary adult female.

Artificial Modifications of the Skeleton

CRANIAL DEFORMATION

Fifteen deformed (Figure 106) skulls were detected in this sample. Nine of these are adult females, five are adult males, and one is a 12-year-old child of undetermined sex (Table 46). All of these deformations display marked flattening of the occipital, and four display flattening of the frontal. Ten of the 15 deformed skulls display considerable asymmetry in the occipital area. The deformed skulls were found in urns as well as in primary interments and were not concentrated in any particular area of the excavation.

The frequency of deformation in the sample is difficult to discern due to the fragmentary nature

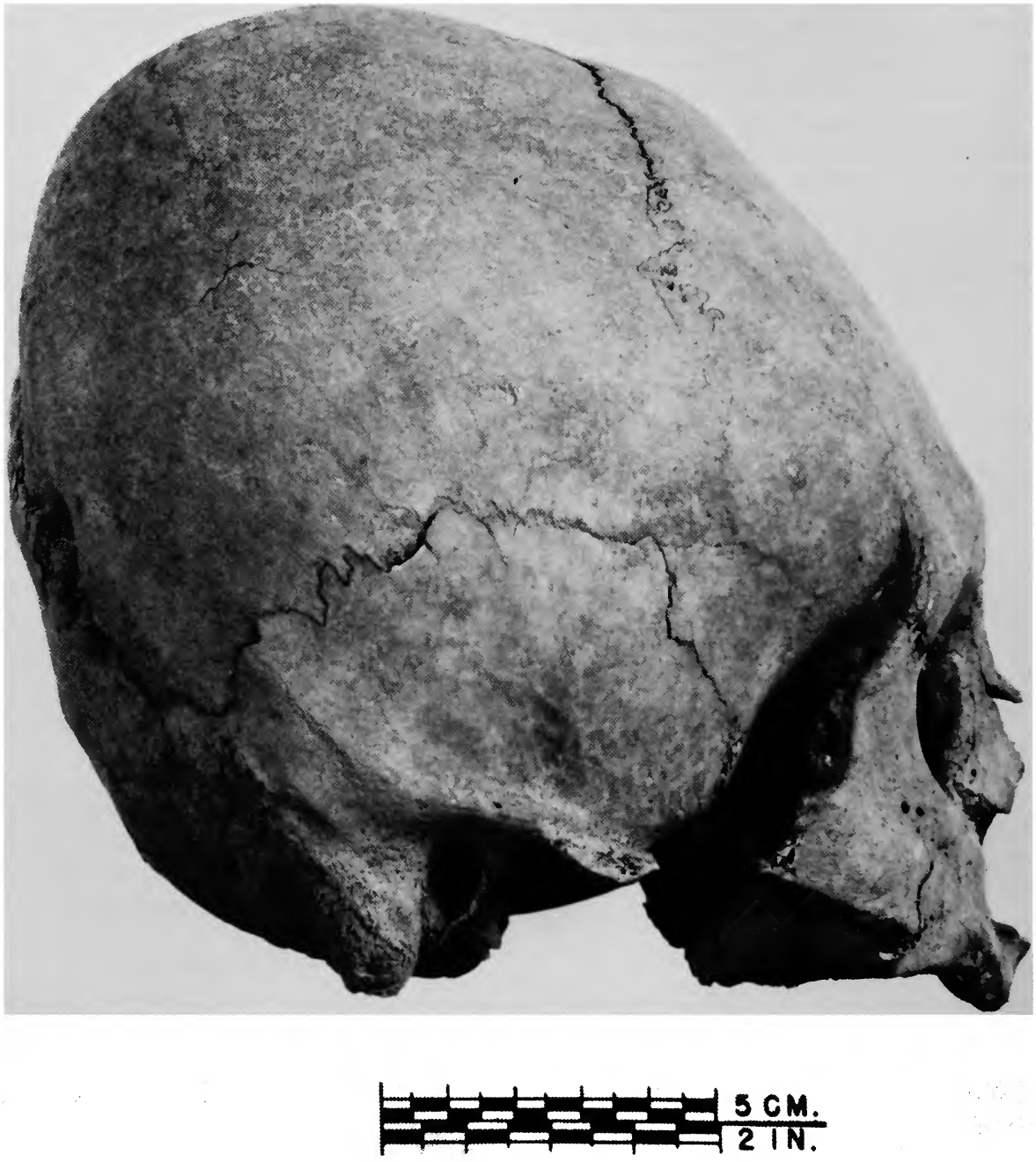

FIGURE 106.—Cranial deformation.

of many crania, especially subadults. Observations of cranial shape are possible on 41 adult crania: 24 from urns and 17 from non-urn burials. This suggests an over-all frequency of 34 percent: 50 percent of the urn sample and 12 percent of the non-urn sample.

The skulls showing only occipital flattening correspond to Neumann's (1942) type 4 (occipi-

TABLE 46.—Characteristics of cranial deformation within the Ayalán sample

Feature	*Type interment*	*Sex*	*Age*	*Location of flattening*		*Asymmetry*
				Occipital	*Frontal*	
6	urn	F	40+	yes	yes	present
21	urn	F	20–30	yes	no	absent
30	urn	F	30–40	yes	no	present
30	urn	M	20–30	yes	no	present
30	urn	M	25–35	yes	no	present
30	urn		11–13	yes	no	present
46	primary	F	20–30	yes	yes	present
52	urn	M	20–30	yes	no	present
53	urn	M	35–45	yes	no	absent
56	urn	F	25–35	yes	no	present
61	urn	F	15–25	yes	no	absent
61	urn	F	15–30	yes	yes	absent
69	urn	M	30–45	yes	no	present
75	urn	F	15–30	yes	yes	present
81	primary	F	15–30	yes	no	absent

tal) and Munizaga's (1976) recently proposed "cuneiform type." This form probably represents unintentional deformation produced in children who are placed on their backs with their heads resting on a hard flat object. An alternative explanation is that boards were attached to the occipital area with bands. The former explanation is more probable since the placement of infants and children in hammocks with their heads on rigid pillows produces similar deformations on the coast of Ecuador today (Jorge Marcos, pers. comm.).

Crania displaying flattening of the occipital and frontal represent intentional deformation. In these cases flat, hard objects were apparently bound to the occipital and frontal areas of the skull during infancy and/or childhood. The four examples in this sample are all females. According to Munizaga (1976) both expressions of cranial

FIGURE 107.—Modification of maxillary teeth, feature 30.

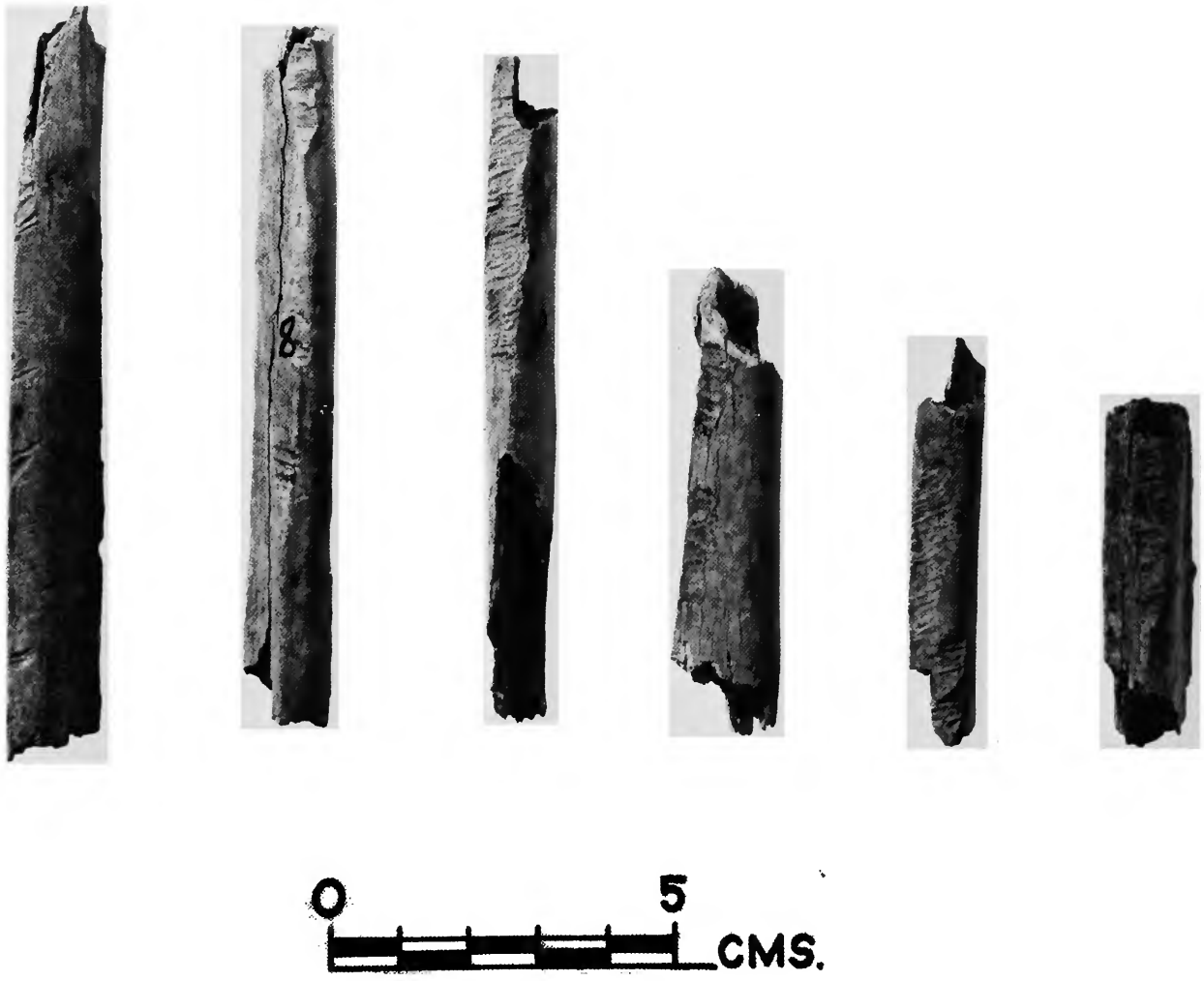

FIGURE 108.—Rodent tooth marks on long bone shafts.

deformity have considerable antiquity on the Ecuadorean coast.

DENTAL MUTILATION

Only one individual in the sample shows evidence of intentional dental modification. One male skull with occipital flattening (from feature 30) displays five anterior maxillary teeth with extensive modification (Figure 107). The left lateral incisor, right central and lateral incisors, right canine, and right first premolar all display loss of most of their crowns. The incisors and crowns are completely destroyed with a deep wedge-shaped smooth-walled depression in the occlusal surface of each tooth. The depressions extend across the complete diameter of each incisor through the center in an anterior posterior direction. In the canine, the entire distal half of the crown was removed so that the occlusal surface angles sharply from mesial to distal. The opposite alteration occurs on the first right premolar; the mesial surface has been altered so that the crown surface slopes from distal to mesial. The pulp cavities are exposed on the incisors and right canine and apical abscesses occur in the alveolus near the root tips of the left central incisor (tooth missing post-mortem) and right lateral incisor.

The alterations appear to have been produced intentionally, probably by filing. Although the reason for the alterations cannot be determined, they may have been produced as a rite of passage or as an indicator of status. The possibility that they were produced by the habitual practice of holding objects in the teeth, also can not be ruled out. Male sex is suggested for this individual by the general size and robustness of the bone. An age at death of 20–25 years is indicated by the extent of dental attrition and cranial suture closure.

Rodent Tooth Marks

Adult long bones from 12 urns show rodent tooth marks (Figure 108). Table 47 summarizes which bones display the marks and the general locations of these urns. All of the bones represent adult long bones and all of the marks are located on shafts. The marks vary from a single alteration to extensive bone removal over 120 mm of the bone surface, although most are concentrated within a 5 cm area along the bone shaft. As Table 47 shows, urns containing bones with rodent tooth marks were located either in the northwest section of the main cut or in cut E. Ten of the 12 urns extended to ground surface, one was only 5 cm below and one was 12 cm below. Nine of the 12 urns contained skeletal remains of *Cavia* sp., a burrowing rat-size rodent, which probably nested in the urns. Although rodents do not normally feed underground, it is conceivable that they could have gnawed on the bones that they encountered while tunnelling or that were located immediately around their nests. The other interpretation is that the bones were gnawed while above ground, prior to burial in the urns. Both interpretations would explain the data and neither can be ruled out.

Table 47.—Location of rodent tooth marks on human bones within urns

Feature	*Location of urn*	*Depth to urn (cm)*	*Adult long bone shafts with marks*
6	A-3	0	femur and radius
7	A-3	0	right fibula
8	A-3	0	7 fragments
23	A-1	0	fibula
26	A-1	5	right ulna and left humerus, radius and ulna
52	N. Ext.	0	left femur
53	N. Ext.	0	fibula
56	N. Ext.	0	left femur
58	N. Ext.	0	2 left femora, right tibia, and a fibula
59	N. Ext.	12	right femur
60	cut E	0	left femur
61	cut E	0	2 left tibiae, 1 right tibia, right femur, left humerus and fibula fragments

Metatarsophalangeal Alterations

Many of the metatarsals display facets and or small bony extensions on the superior surface of the distal end (Figure 109*a*,*b*). The facets vary morphologically from a proximal extension of the distal articular surface to a ridge on the superior surface, connecting the lateral tubercles (site of attachment of collateral ligaments). The facets are usually flat with sharply defined proximal borders. In addition, the first proximal phalanx displays a bony protuberance on the superior surface, extending distally from the proximal articular surface (Figure 109*c*). The protuberance extends 2 to 4 mm above the normal bone surface.

As Table 48 reveals, the alterations occur on about 20 percent of all metatarsals and first proximal foot phalanges that are complete enough to allow such observations to be made. The alterations occur with similar frequencies on the first three metatarsals and first phalanx, but are less common and not as prominently expressed on the fourth and fifth metatarsals. They occur with higher frequency on bones from urns (22 percent) than on those from the earlier non-urn features (10 percent). Alterations occur with nearly equal frequency on bones from the left and right feet.

Table 49 compares measurements of bones with alterations and those without. All measurements are of maximum length, taken with a sliding caliper held parallel with the axis of the bone. For the first two metatarsals and the first

proximal phalanx, the mean length of bones with alterations is substantially shorter than the mean length of bones without them. Student's *t* test for differences between the means in each case revealed differences significant at the .001 level.

The obvious explanation of the high association of alterations with shorter bones is that they occur predominantly on bones of females. Unfortunately most of the bones come from secondary deposits where it is not possible to determine accurately sex of the foot bones. Of the six bones with alterations found with primary skeletons, all are from females (Table 50).

The morphology and location of these alterations suggest that they were probably produced by stress brought about by frequent extreme hyperdorsiflexion of the metatarsophalangeal joints with subsequent extension of the synovial capsule and articular cartilage. This joint displacement would occur if the individual habitually assumed a kneeling position, with body weight producing considerable joint reaction force at this site (Figure 110). A survey of clinical literature produced only one described condition that would result in similar alterations. Lewin describes an occasional "metatarsophalangeal osteochondritis," which is produced in executives who habitually sit at desks with their heels off the floor "resting on the toes" (1959:102–103). The result is callus and bunion formation at the metatarsophalangeal joint with corresponding skeletal modifications.

In a separate comparative study, I have shown that these alterations occur in other American Indian and Eskimo skeletal samples and appear to be correlated with skeletal indicators of knee hyperflexion (Ubelaker, 1979). Such correlations are not possible for skeletal remains from the secondary urn burials since femora and foot bones from single skeletons can seldom be related. The one primary skeleton with metatarsal alterations and both femora present displayed facets on the femoral condyles, which indicate hyperflexion of the knee (Trinkaus, 1975) and provide additional evidence for habitual kneeling posture. The kneeling position probably represents habitual work and/or rest posture.

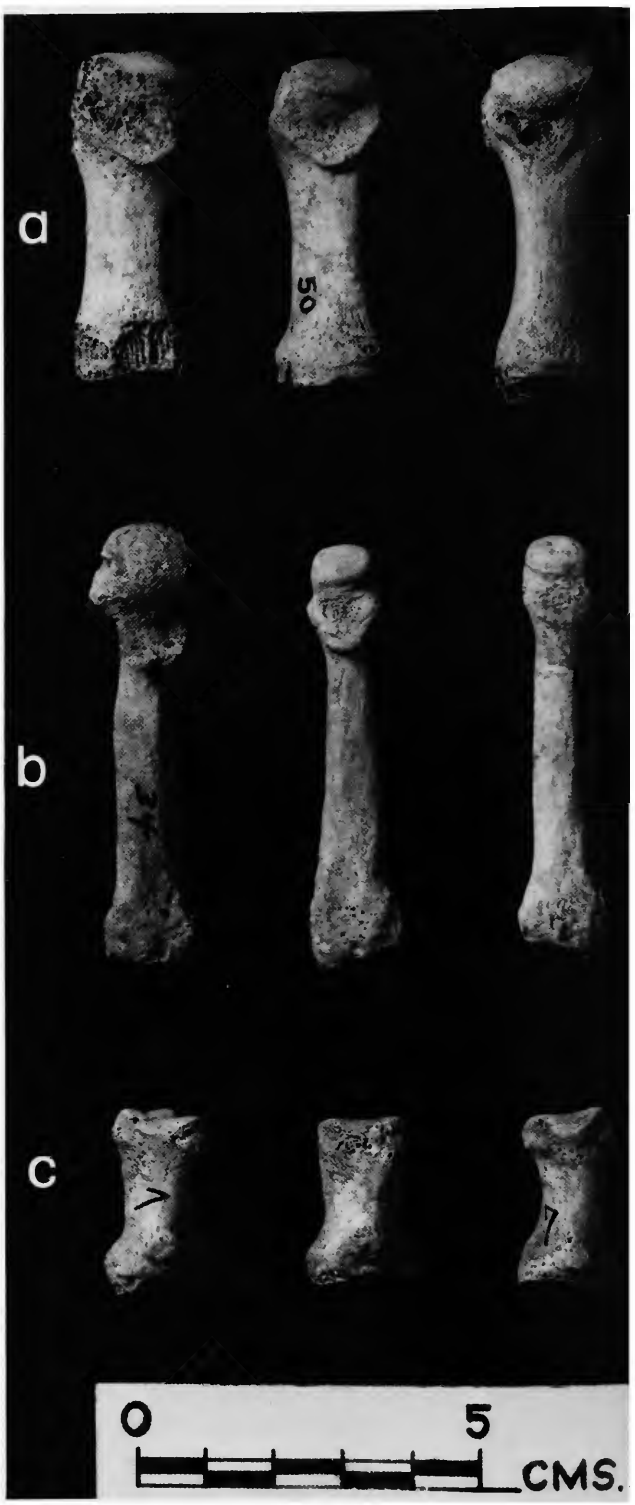

FIGURE 109.—Alterations of foot bones: *a*, first metatarsals; *b*, second and third metatarsals; and *c*, first proximal foot phalanges.

TABLE 48.—Frequency of alterations on foot bones: metatarsals and first proximal phalanges (No. = number of bones present; % = percentage with alterations)

Bone		*Urn burials*						*Non-urn burials*					
		Left		*Right*		*Left-Right*		*Left*		*Right*		*Left-Right*	
		No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Metatarsal	1	91	25	67	24	158	25	9	0	11	9	20	5
	2	47	28	49	37	96	32	5	20	5	40	10	30
	3	39	26	34	24	73	25	4	0	4	25	8	13
	4	37	11	44	20	81	16	3	0	3	0	6	0
	5	43	0	40	0	83	0	5	0	4	0	9	0
Phalanx		–	–			99	26	–	–	–	–	8	13
Total		257	19	234	22	590	22	26	4	27	15	63	10

TABLE 49.—Comparisons of lengths (mm) of foot bones displaying alterations with those that lack alterations

Bone	*With facets*				*Without facets*			
	No.	*Mean*	*SD*	*Range*	*No.*	*Mean*	*SD*	*Range*
Left 1st metatarsals	23	54	4	43–64	73	57	6	52–65
Right 1st metatarsals	17	53	4	43–59	68	57	3	52–66
Left 2nd metatarsals	17	65	4	58–75	41	72	4	65–78
Right 2nd metatarsals	19	65	3	59–69	32	71	6	56–82
First proximal phalanges	33	27	2	24–33	90	31	3	25–35

TABLE 50.—Frequency of alterations on foot bones in male and female primary burials

Bone		*Male*		*Female*		
		No. bones	*No. with alteration*	*No. bones*	*No. with alteration*	*%*
Metatarsal	1	11	0	6	1	17
	2	6	0	4	3	75
	3	3	0	5	1	20
	4	2	0	4	0	0
	5	5	0	4	0	0
Phalanx		5	0	2	1	50
Total		32	0	25	6	24

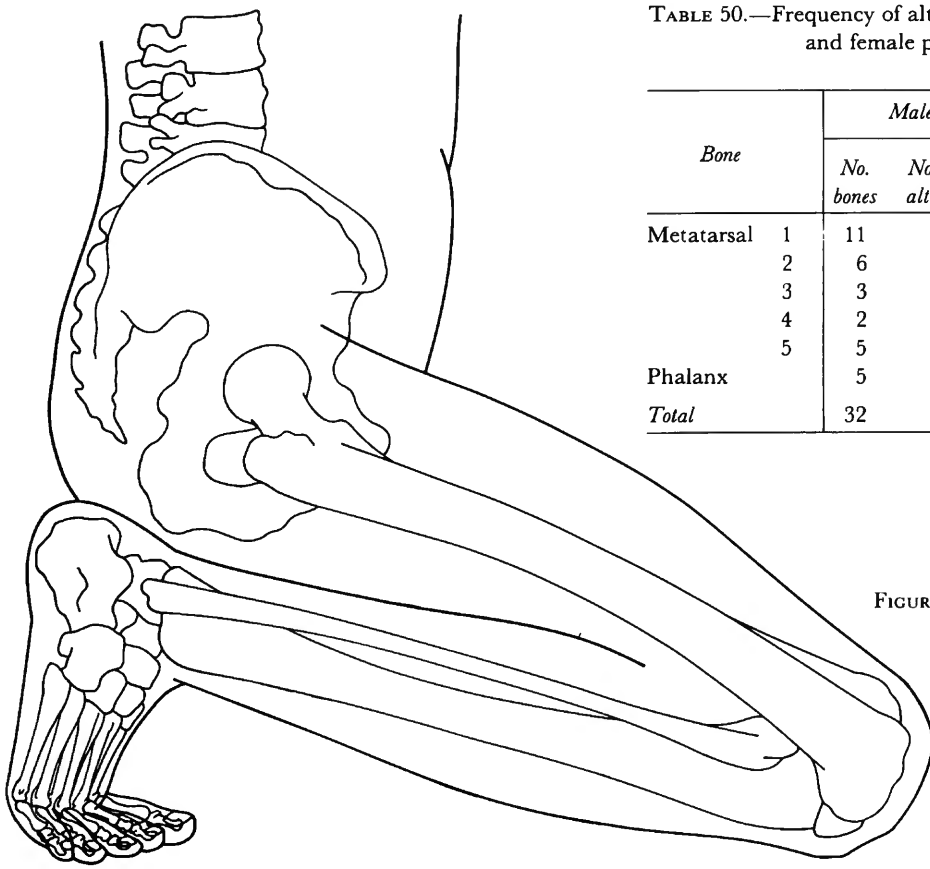

FIGURE 110.—Kneeling position with hyperdorsiflexion of toes.

TABLE 51.—Cranial measurements (mm) and indices

Measurement	*Urn*								*Non-urn*							
	Males				*Females*				*Males*				*Females*			
	No.	*Mean*	*SD*	*Range*	*No.*	*Mean*	*SD*	*Range*	*No.*	*Mean*	*SD*	*Range*	*No.*	*Mean*	*SD*	*Range*
Auricular height	8	121	5	113–127	14	118	4	111–124	4	120	3	117–124	3	120	3	117–122
Porion to bregma	8	117	6	115–123	14	114	4	111–121	4	117	1	117–118	3	116	5	110–120
Length	9	172	7	159–184	14	165	7	157–179	7	171	7	158–179	4	165	3	161–169
Breadth	9	148	5	137–153	15	143	4	136–151	4	143	6	139–153	4	142	5	138–148
Basion to bregma	7	131	4	125–136	6	130	5	123–137	1	127	–	–	–	–	–	–
Basion to porion	6	16	5	8–20	7	17	4	13–23	1	11	–	–	–	–	–	–
Minimum frontal breadth	11	92	5	80–97	12	89	2	86–93	6	93	4	88–97	4	93	4	89–99
Upper facial height	8	71	3	65–73	10	66	4	62–71	3	72	4	68–76	–	–	–	–
Facial width	7	136	5	131–145	6	130	4	125–134	2	130	1	129–130	–	–	–	–
Nasal height	9	51	2	49–54	10	49	3	42–55	3	53	3	50–56	–	–	–	–
Nasal breadth	10	24	1	23–26	11	24	2	22–27	3	25	1	25–26	–	–	–	–
Orbital height	8	35	2	32–37	10	35	2	31–38	3	37	1	37–38	–	–	–	–
Orbital breadth	8	39	2	37–41	10	40	3	35–44	3	36	3	32–38	–	–	–	–
Maxillo-alveolar length	9	53	4	47–59	11	50	2	48–55	3	52	1	52–53	2	57	4	54–59
Maxillo-alveolar breadth	10	66	4	62–72	11	60	5	52–67	4	65	1	65–66	–	–	–	–
Palatal length	9	49	3	41–50	9	43	2	40–47	2	47	1	46–48	–	–	–	–
Palatal breadth	10	40	2	37–43	11	39	2	35–44	4	39	2	37–41	–	–	–	–
Bicondylar breadth	4	121	6	113–128	5	120	5	114–126	5	120	2	117–123	2	110	0	110–110
Bigonial breadth	6	101	6	95–111	7	92	4	87–97	6	101	5	92–107	3	91	7	84–98
Height of ascending ramus	5	60	2	57–62	7	54	5	48–61	5	62	2	60–65	2	55	1	54–55
Minimum breadth of ascending ramus	8	34	3	31–40	7	32	2	29–36	6	34	3	31–39	3	33	2	31–35
Height mandibular symphysis	8	35	3	30–39	7	31	3	25–35	7	35	3	31–39	3	30	4	26–34
Facial height	6	121	6	113–128	6	107	9	95–117	3	116	7	110–123	–	–	–	–
Cranial index	6	86	5	81–94	9	87	5	76–93	3	87	5	81–90	5	85	2	83–88
Mean porion height index	8	74	4	66–79	14	74	3	69–78	3	75	2	72–76	3	75	3	72–78

Biological Inferences

Cranial Measurements

Selected cranial measurements defined by Bass (1971) were recorded for all undeformed adult crania that were sufficiently complete. The measurement list and summary statistics are provided in Table 51. Generally the data show little variability between the urn samples and the non-urn samples. Both groups show high and very broad (hyperbrachycranic) crania. The crania show a higher mean cranial index than found in the small samples of Valdivia and Machalilla crania reported by Munizaga (1965). More elaborate comparison with other coastal populations is not possible until additional samples become available.

Non-Metric Observations

Twenty-seven observations were recorded for all undeformed adult crania and all adult mandibles. These traits were selected because of their usefulness in discriminating populations in other studies. All were recorded as either present or absent. Bilateral traits were recorded for each side, while traits on the midline were recorded only once. These traits are listed in Table 52. The first 26 traits in the table are defined by Ossenberg (1974, 1976). The last trait, three-rooted mandibular first molars is defined by Turner (1971). Frequencies of these traits in the urn and non-urn samples are also presented in Table 52. The frequency of three-rooted mandibular first molars represents the number of persons showing

Table 52.—Frequency of non-metric cranial and mandibular observations (absence of maxillary third molar = congenital absence)

Observation	*Observations per skeleton*	*Urn*			*Non-urn*		
			Present			*Present*	
		Total	*No.*	*%*	*Total*	*No.*	*%*
Mylohyoid bridge	2	34	4	12	22	0	0
Accessory mental foramen	2	36	1	3	24	2	8
Frontal groove	2	56	13	23	24	3	8
Supraorbital foramen	2	59	17	29	23	8	35
Trochlear spur	2	44	2	5	6	0	0
Accessory optic canal	2	33	0	0	4	0	0
Infraorbital suture	2	45	21	47	8	1	13
Os Japonicum	2	21	0	0	3	0	0
Wormian bone	2	52	27	52	24	5	21
Parietal process of temporal squama	2	51	2	4	13	0	0
Squamoparietal synostosis	2	56	1	2	22	0	0
Auditory exostosis	2	176	4	2	30	2	7
Pharyngeal fossa	1	21	2	10	5	1	20
Paracondylar process	2	28	1	4	2	0	0
Intermediate condylar canal	2	28	4	14	5	1	20
Odonto-occipital articulation	1	15	0	0	1	0	0
Hypoglossal canal divided	2	28	2	7	6	0	0
Post condylar canal absent	2	27	19	70	2	2	100
Marginal foramen of tympanic plate	2	128	24	19	28	8	29
Tympanic plate dehiscence	2	170	26	15	30	8	27
Foramen in lateral pterygoid plate	2	23	0	0	2	0	0
Pterygobasal bridge	2	35	0	0	2	0	0
Foramen spinosum incomplete	2	36	7	19	2	0	0
Pterygospinous bridge	2	37	0	0	2	0	0
Maxillary third molar	2	29	24	83	12	11	92
Clinoid bridge	2	34	0	0	2	0	0
Three roots on mandibular first molar	2	82	2	2	18	1	6

TABLE 53.—Statures (cm) calculated from lengths (cm) of long bones from urns

Feature	*Bone*	*Sex*	*Length*	*Stature*
2	femur	M	44.9	165.5
2	femur	F	42.2	156.5
4	femur	M	38.5	151.0
6	femur	M	43.5	162.5
7	femur	F	39.5	149.5
8	femur	M	43.8	163.0
9	femur	M	43.1	161.5
10	femur	F	39.4	149.3
10	femur	F	41.0	153.5
10	femur	F	34.8	137.5
10	femur	F	40.0	151.0
10	femur	M	40.5	155.5
15	femur	F	40.9	153.0
16	femur	F	38.5	147.0
17	femur	M	43.8	163.0
17	femur	M	39.6	153.5
17	femur	F	41.0	153.5
17	femur	F	42.5	157.3
17	femur	M	44.0	163.5
21	femur	F	39.7	150.0
21	femur	F	36.1	140.7
21	femur	M	39.5	153.3
21	femur	M	42.4	160.0
21	femur	M	40.2	155.0
21	femur	F	41.3	154.3
23	femur	M	40.1	154.5
23	femur	F	40.1	151.0
23	femur	F	40.8	153.0
24	femur	M	39.7	153.7
24	femur	F	37.8	145.0
24	femur	M	41.7	158.3
26	femur	F	42.0	156.0
26	fibula	M	33.7	158.7
27	femur	F	38.0	146.0
30	femur	F	39.1	148.5
30	femur	M	40.5	155.5
30	femur	M	44.3	164.0
30	femur	F	39.2	148.7
30	femur	F	36.5	141.7
34	humerus	F	28.6	151.5
50	femur	F	35.5	143.0
50	humerus	F	24.8	135.5
58	femur	F	36.5	141.7
59	femur	M	44.3	164.0
60	femur	M	44.2	164.0
60	femur	M	42.3	159.5
61	femur	M	44.4	164.5
61	femur	F	39.0	148.5
61	femur	F	36.0	140.5
61	femur	F	40.0	151.0
61	femur	F	39.0	148.5
61	femur	M	40.5	155.5
62	femur	M	40.0	154.5
62	femur	F	38.8	147.7
69	tibia	F	33.2	151.7
69	tibia	M	34.8	159.8

TABLE 54.—Statures (cm) calculated from lengths (cm) of long bones from primary and secondary deposits

Feature	*Bone*	*Sex*	*Length*	*Stature*
9	femur	M	44.5	164.5
19	femur	M	41.0	157.0
28	femur	F	39.5	149.5
33C	femur	M	44.2	164.0
35	femur	F	41.0	153.5
37A	femur	F	32.5	131.5
37C	humerus	M	27.8	159.0
39	humerus	F	28.9	155.5
40	femur	M	38.5	151.0
42	femur	F	42.2	156.5
43	femur	M	43.3	162.0
44	femur	F	39.5	149.5
48	femur	F	38.2	146.0
49	humerus	M	29.1	156.5
55	femur	M	42.0	159.0
64	femur	M	40.9	156.5

the trait on at least one side. All other traits are expressed as the percentage of the total number of observations taken. Differences in the urn and non-urn frequencies should be viewed with caution since the non-urn sample sizes are very small.

ESTIMATES OF LIVING STATURE

Living stature was estimated from long bone lengths using the methodology and regression equations of Genovés (1967). Most estimates were made from femoral lengths although other bones were employed when the femur was not available. Table 53 presents estimates for individuals found within urns. Table 54 presents the same data for the non-urn features. Stature for all features averaged 148.6 cm (4 ft, 8¼ in) for females (n = 38) with a range between 131.5 cm (4 ft, 3¾ in) and 157.3 cm (5 ft, 1¾ in). Male stature for all features

(n = 34) averaged 158.9 cm (5 ft, 2⅝ in) with a range from 151.0 cm (4 ft, 11½ in) to 165.5 cm (5 ft, 5¼ in). Little differences occur between statures of individuals from urns and those from other features. For males, average stature of individuals from urns (n = 25) is 158.9 cm while stature of individuals from other features (n = 9) is 159.2 cm. For females, urn statures (n = 31) average 148.9 cm while non-urn statures (n = 7) are also 148.9 cm.

Although these estimated living statures are small, they are within the normal range for recent Indian groups in northwestern South America, summarized by Steggerda (1950). Gillin (1941) presents a male mean stature of 156 cm for recent populations in Imbabura Province, Ecuador. His measured statures ranged from 140 to 172 cm. Similar short statures are reported by Rouma (1933) and Chervin (1907–1908) for Bolivian populations. Rouma (1932:191) presents a female average stature of below 150 cm for 112 Quitchouas and 21 Cañaviri.

Trauma

Skeletal evidence of trauma in this material consists of healed fractures of long bones, traumatic dislocation of a right humerus, compression fractures of foot bones, and union of several vertebrae. The 30 fractures found in these samples involve 12 radii, four ulnae, three fibulae, three ribs, one clavicle, one metatarsal, one foot phalanx, one hand phalanx, one talus, one navicular, one scapula, and one humerus. The most common type of fracture is Colles' fracture of the distal radius or ulna (Figure 111). Ten (33 percent) of the 30 fractures are of this type. These include four left and five right radii and one right ulna. All of these are well healed, with radiographs revealing little structural evidence of the fracture site.

Additional fractures of lone bone shafts include the following: feature 2, proximal shaft of left ulna; feature 6, two rib fragments; feature 8, midshaft radius with poor alignment of the fractured segments; feature 8, distal right fibula, fracture just above articular surface; feature 9, left ulna, fracture and non-union of olecranon process; feature 11, rib midshaft; feature 11, fracture at joint of proximal and middle hand phalanges with subsequent union and poor alignment of segments; feature 15, fibula midshaft; feature 16, right clavicle midshaft; feature 16, left radius midshaft (bone also shows Colles' fracture); feature 18, right second metatarsal, proximal shaft with slight misalignment of segments; feature 21, proximal foot phalanx midshaft; feature 22, distal right fibula, just above articular surface; feature 60, left radius and left ulna, each fractured at midshaft area with poor alignment of segments. All of the above are well remodeled except for the radius and ulna from feature 60 where the prefracture cortex is plainly visible with radiographs.

The fractured left ulna from feature 9 is especially interesting since the fracture occurs through the proximal articular surface and represents nonunion (pseudoarthrosis). This specimen has been described separately by Stewart (1974) who points out how rarely this type of fracture has been found in prehistoric samples. As Figures 112 and 113 illustrate, the fracture extends dorsally and distally from the middle of the joint surface. The two segments articulate closely, suggesting a close fibrous union. The margins of the normal articular surface show extensive arthritic lipping; however, the general normal appearance of the rest of the joint surface suggests the joint continued to function after the fracture occurred.

Compression-crushing type fractures occur on one right navicular from feature 2 and one right talus from feature 8. The navicular shows considerable destruction and eburnation of the talar surface (Figure 114). The talus (feature 8) shows destruction and remodeling of the calcaneal articular surface with considerable shortening of the superior-lateral dimension. Both fractured bones probably resulted from falls.

Figure 115 illustrates a right scapula from feature 9 where a new articulation for the head of the right humerus has formed on the anterior surface of the scapula. The normal glenoid cavity shows bony changes indicative of prolonged use,

FIGURE 111.—Colles' fractures of distal radii.

FIGURE 112.—Nonunion of fracture through the semi-lunar notch of ulna from feature 9.

FIGURE 113.—Pseudoarthrosis articular surfaces of ulna illustrated in figure 112 with segments separated.

FIGURE 114.—Fracture of talar surface of a right navicular from feature 8.

FIGURE 115.—New articulation for head of humerus after traumatic dislocation on anterior surface of a right scapula from feature 9.

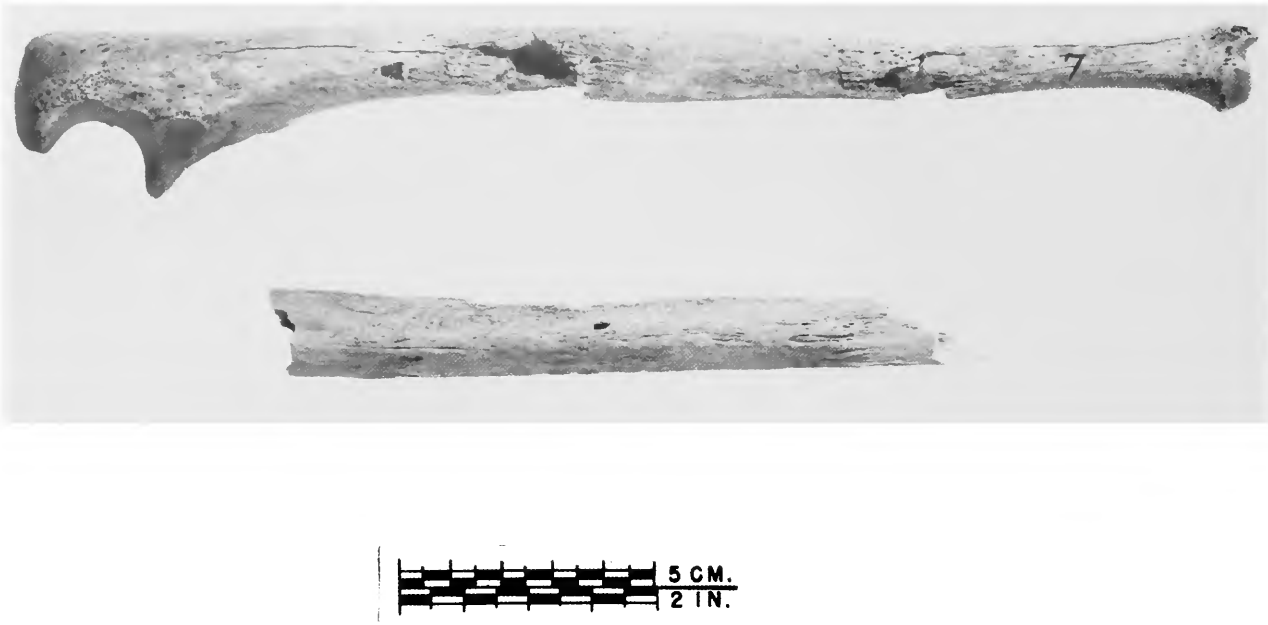

FIGURE 116.—Active periosteal lesions on left ulna and inactive lesions of fibula fragment, both from feature 7.

thus the traumatic dislocation of the humerus must have occurred late in the life of the individual, but was obviously not an immediate cause of death. The non-union fracture of the left ulna (Figures 112 and 113) also came from this male primary skeleton.

Of the 30 fractures, 25 are from urn features and five are from non-urn features. All fractures occur on adult bones. The number of fractures per individual age 15 years or greater is 0.13 in the urn sample and 0.18 in the non-urn sample. Sex of the individuals with fractures in the urn sample cannot be determined due to the secondary nature of the urn samples. All five of the fractures in the non-urn sample are from males (three individuals).

Seven examples of noncongenital fusion of two adjacent vertebrae were found. The features and vertebrae involved are as follows: feature 8, two thoracic vertebrae, probably between 3 and 9; feature 16, 10–11 thoracics; feature 19, two 3–7 cervicals; feature 52, 10–11 thoracics; feature 53, two 2–7 thoracics; feature 56, two thoracics; feature 64, two lumbars totally fused with the collapse of one lumbar centrum. Five of these are from urns and two are from male primary skeletons. Radiographs of these specimens reveal intervertebral spaces or other indications of a noncongenital origin. Some could represent fusion due to extreme osteophytosis of very old age; however, it is very likely that in all cases, fusion was precipitated by trauma.

Infectious Disease

Thirty of the bones examined from ten features show abnormal periosteal bone apposition, remodeling, thickening of the cortex, or other evidence of infectious disease.

Many of these lesions were not active at the time of death. Their periosteal surfaces are well remodeled and they certainly were not causal factors of death. Others show lytic lesions or reactive bone indicating the lesions were active at time of death. Some of these may have contributed to the death of the individual.

Feature numbers, conditions and locations of the lesions are as follows: feature 2, long bone diaphysis fragment (active); feature 7, left fifth metatarsal (entire bone, inactive), right second metatarsal (entire bone, inactive), three fibula diaphysis fragments (2 inactive, 1 active), left ulna (two sites on diaphysis, active), right fibula (distal metaphyseal area, active), two right tibiae (most of diaphysis, active); feature 11, proximal half of right femur (active); feature 12, fibula diaphysis fragment (inactive); feature 17, femur and fibula diaphysis fragments (inactive); feature 22, distal metaphyseal area of right fibula (inactive); feature 50, twelfth thoracic vertebra centrum (active); feature 58, right radius diaphysis (inactive), metaphyseal areas of two distal right fibulae (inactive), fibula diaphysis (inactive), left and right tibiae (entire bones active), distal diaphysis of right ulna (active); feature 60, four lumbar vertebrae and at least two other vertebrae (active); feature 61, lateral diaphysis of right ulna (inactive). The long bone fragment from feature 2 is subadult; all others are adult.

The contrast between active and inactive lesions is shown in Figure 116. The fibula fragment shows periosteal bone deposited over the pre-existing normal cortex but the bone surface is well remodeled with no evidence of activity at the time of death. In contrast, the left ulna shows active lesions at two sites on the lateral diaphysis. New periosteal bone is finely striated with numerous pinpoint lacunae. Much of the missing bone was lost post-mortem; however, cloaca penetrate the cortex to the medullary cavity with obvious necrosis of the immediately surrounding bone tissue.

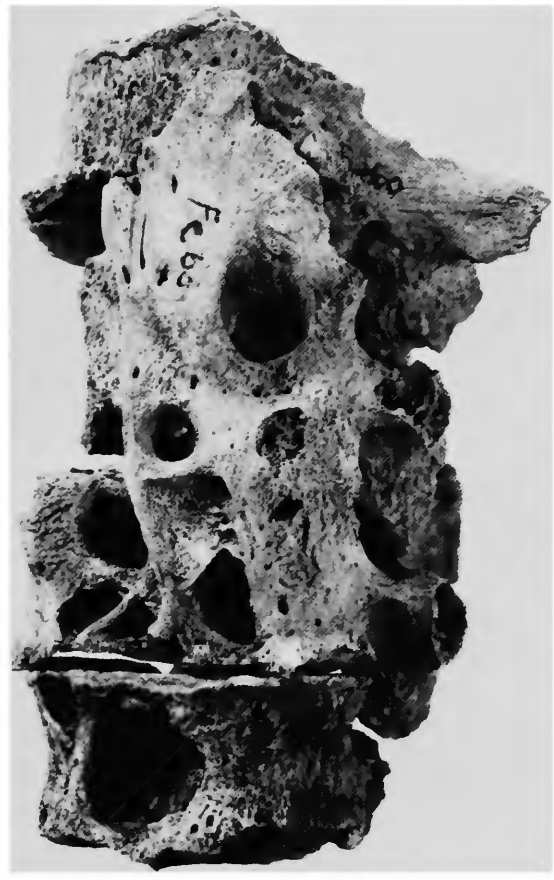

FIGURE 117.—Ventral view of four lumbar vertebrae from feature 60 showing extensive destruction and remodelling of the centra.

Of the lesions mentioned above, those in the lumbar vertebrae of feature 60 are especially interesting. A ventral view of the centra of these four vertebrae is shown in Figure 117. The insides of the centra of the two central vertebrae have been completely destroyed. Large sinuses permeate the remaining shells of the centra. Although the destruction is massive, the extent of remodeling suggests the individual lived, perhaps several years with these lesions. The lesions are characteristic of a non-suppurative osteomylitis, such as that due to Brucella infection. Of course, an exact diagnosis cannot be made due to the fragmentary and incomplete nature of the material.

The number of bones showing infectious lesions per individual in the urn sample is 0.08. In the non-urn sample the figure is 0.02.

FIGURE 118.—Porotic hyperostosis of adult cranial fragments from feature 2.

POROTIC HYPEROSTOSIS

Cranial lesions representing at least 12 individuals from nine features consist of what has been termed porotic hyperostosis. These lesions consist of concentrations of perforations or irregular bone formations on the external surface of the cranial vault and/or orbits, usually accompanied by expansion of the diploë. Lesions on the orbits are usually termed "cribra orbitale." The lesions vary from small concentrations of pin-point perforations to large irregular deposits resulting in thickening of the cranial vault. The following is a detailed description of the individual specimens.

Feature 2. Seven adult cranial vault fragments show extensive porosity and new bone formation on the outer surfaces (Figure 118). The outer surface has a "honey-comb" appearance with a cross-section revealing a "hair-on-end" structure. Margins of the structures are rounded, suggesting the condition had been present for some time before death. One fragment shows a sagittal suture fused endocranially and ectocranially, thus suggesting the individual was a mature adult. The thickest fragment measures 17 mm.

FIGURE 119.—Porotic hyperostosis of skull of child from feature 5.

Feature 5. Porotic hyperostosis is present on two individuals from this urn, an infant, age 1 year, and a child, age 10.5 years. The infant skull shows slight cribra orbitale in both orbits and perforation concentrations on the occipital and parietals near the lambdoidal suture. The 10.5-year-old lacks cribra orbitale, but shows extensive new bone formation and thickening on both parietals (Figure 119). Some porosity occurs on the occipital near the lambdoidal suture.

Feature 8. Three adult parietal fragments show well remodeled lesions with fine perforations

remaining. Maximum thickness is 14 mm.

Feature 10. One subadult frontal shows considerable cribra orbitale in both orbits.

Feature 21. One subadult cranium shows slight cribra orbitale in the right orbit (left orbit not present) with fine perforations on the occipital and parietals.

Feature 25. One subadult cranium shows fine perforations on the parietals.

Feature 37A. Young adult cranium shows well-remodeled thickening of both parietals. The outer surface displays remnants of the "honeycomb" pattern shown more clearly in Figure 118 from feature 2.

Feature 37D–E. Two subadult parietal fragments show the thickening and "honey-comb" pattern.

Feature 50. This infant cranium shows cribra orbitale in both orbits with pinpoint perforations along the superior margin of the occipital and on the parietals along the lambdoidal suture and near bregma.

Feature 56. An adult cranium shows perforations and thickening on the occipital above the nuccal lines and on most of the posterior third of the parietals. An infant occipital displays pinpoint perforations near the lambdoidal suture.

Of the 12 individuals displaying these lesions, 10 are from urn features and two are from non-urn features. The number of bones showing lesions per individual in the urn sample is 0.07. For the non-urn sample, the figure is 0.08.

In this sample, the condition appears in infancy and early childhood as pinpoint perforations along the lambdoidal sutures on the occipital and parietals. The area of perforations then expands to cover most of the parietals and the occipital above the nuccal lines with cribra orbitale appearing in the orbits. In adults the parietals are greatly increased in thickness with "honey-comb" bone formation which in cross-section presents a "hair-on-end" appearance. Other investigators have generally attributed these lesions to a bony response to anemia, with vitamin deficiency and such diseases as malaria, thalassemia, and sicklemia as possible causative factors (El-Najjar et al, 1976).

Degenerative Changes

Degenerative changes in the human skeleton are a normal product of the aging process; however, the rate of change can be influenced by activity, disease, nutrition, and other factors. Since most degenerative change is produced by a variety of factors, interrelated in a complex manner, we can seldom determine the specific cause of a particular bone formation. At the population level, it may be possible to detect differences in the rate of change and the distribution of that change in various parts of the skeleton.

Osteophytosis

Stewart (1958) classified osteophytes into five categories, the first of which is complete absence, with the other four being present with increasing size. These five stages of development are visually presented by Ubelaker (1978:60). In this study, absence is represented by category 0. Category 1 represents a combination of Stewart's stages 1 and 2. Category 2 represents a combination of Stewart's stages 3 and 4. Table 55 presents frequency data for these categories in the urn and non-urn samples. Data were collected for 1825 vertebrae: 576 cervicals, 827 thoracics, and 422

Table 55.—Frequency of vertebral osteophytosis in urn and non-urn samples (for definition of categories of osteophytosis, see text)

Sample	*0*		*1*		*2*		
	No.	*%*	*No.*	*%*	*No.*	*%*	*Total*
Cervical							
Urn	247	51	184	38	55	11	486
Non-urn	58	64	24	27	8	9	90
Total	305	53	208	36	63	11	576
Thoracic							
Urn	265	39	371	55	42	6	678
Non-urn	67	45	73	49	9	6	149
Total	332	40	444	54	51	6	827
Lumbar							
Urn	90	26	174	50	83	24	347
Non-urn	31	41	28	37	16	21	75
Total	121	29	202	48	99	23	422

lumbars. In both the urn and non-urn samples the cervical vertebrae show the highest frequency of stage 0 osteophytosis, followed by the thoracics and then the lumbars. This contrasts somewhat with Stewart's (1958) modern data, where lumbar vertebrae show the highest frequency of stage 0. The data may suggest that the Ayalan populations had activity that put exceptional stress on the lower back.

The data also show that the non-urn sample has less osteophytic development than the urn sample. In the urn sample 909 (60 percent) of 1511 vertebrae examined show some osteophytic development. In the non-urn sample only 158 (50 percent) of 314 vertebrae examined show osteophytes.

Frequencies of lipping on the margins of long bone joint surfaces are similar for urn and non-urn samples (Table 56) with about 20 percent of all joint surfaces examined displaying some lipping. The urn sample shows more lipping than the non-urn sample on the proximal tibia and patella, but less on the proximal humerus, calcaneus, and distal tibia. Stage 1 lipping represents a minimal expression. Stage 2 refers to bony extensions greater than 2 mm.

Spicule formation was recorded for the anterior proximal tibia, the inferior surface of the calcaneus, and the non-articular surface of the patella (Table 57). Spicules occur on the tibia and patella with a frequency of 10 percent or less in both urn and non-urn samples. Spicule formation is much more common on the calcaneus.

TABLE 56.—Arthritic lipping around joint surfaces in urn and non-urn samples (for definition of stages of lipping see text)

Sample	*0*		*1*		*2*		
	No.	*%*	*No.*	*%*	*No.*	*%*	*Total*
Humerus, head							
Urn	47	68	20	29	2	3	69
Non-urn	12	52	9	39	2	9	23
Tibia, proximal							
Urn	66	82	14	18	0	0	80
Non-urn	15	88	2	12	0	0	17
Tibia, distal							
Urn	92	98	2	2	0	0	94
Non-urn	14	78	4	22	0	0	18
Patella							
Urn	108	71	37	24	8	5	153
Non-urn	15	75	5	25	0	0	20
Calcaneus, cuboid facet							
Urn	158	88	20	11	2	1	180
Non-urn	14	67	7	33	0	0	21
Total							
Urn	471	82	93	16	12	2	576
Non-urn	70	71	27	27	2	2	99

Joint Surface Degeneration

Degeneration of joint surfaces was recorded for 12 surfaces (Table 58). Eighty percent of the 1549 joint surfaces examined showed no evidence of cartilage destruction or bone degeneration. Fifteen percent of the surfaces displayed perforations, small bony deposits, or other evidence of initial joint degeneration (stage 1). Two percent displayed stage 2 degeneration, e.g., perforations or bony deposits on over 25 percent but less than 75 percent of the joint surface. Two percent displayed stage 3 degeneration consisting of bony change on at least 75 percent of the joint surface, usually accompanied by eburnation.

In both urn and non-urn samples, degeneration was most frequent at the elbow joint, particularly

TABLE 57.—Frequency of spicule formation on the patella, calcaneus, and anterior proximal tibia in urn and non-urn samples

Sample	*Present*		*Absent*		
	No.	*%*	*No.*	*%*	*Total*
Tibia					
Urn	4	5	84	95	88
Non-urn	1	6	17	94	18
Patella					
Urn	14	10	133	90	147
Non-urn	1	5	19	95	20
Calcaneus					
Urn	77	54	66	46	144
Non-urn	8	50	8	50	16

TABLE 58.—Degeneration of joint surfaces in urn and non-urn samples (for definition of stages of degeneration, see text)

Sample	*0*		*1*		*2*		*3*		
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*Total*
Humerus, distal									
Urn	80	58	46	34	7	5	4	3	137
Non-urn	14	50	10	36	4	14	0	0	28
Radius, proximal									
Urn	94	77	20	17	4	3	4	3	122
Non-urn	15	83	2	11	1	6	0	0	18
Radius, distal									
Urn	81	79	16	16	4	4	1	1	102
Non-urn	16	73	6	27	0	0	0	0	22
Ulna, proximal									
Urn	71	51	59	43	6	4	3	2	139
Non-urn	10	37	13	48	4	15	0	0	27
Ulna, distal									
Urn	44	83	7	13	0	0	2	4	53
Non-urn	6	60	4	40	0	0	0	0	10
Femur, distal									
Urn	75	69	21	20	3	3	9	8	108
Non-urn	15	79	3	16	1	5	0	0	19
Tibia, proximal									
Urn	77	88	6	7	0	0	5	5	88
Non-urn	18	100	0	0	0	0	0	0	18
Tibia, distal									
Urn	104	97	1	1	0	0	2	2	107
Non-urn	18	100	0	0	0	0	0	0	18
Fibula, proximal									
Urn	28	90	3	10	0	0	0	0	31
Non-urn	6	100	0	0	0	0	0	0	6
Fibula, distal									
Urn	89	95	5	5	0	0	0	0	94
Non-urn	13	81	3	19	0	0	0	0	16
Calcaneus, cuboid art.									
Urn	163	98	4	2	0	0	0	0	167
Non-urn	18	100	0	0	0	0	0	0	18
Calcaneus, superior									
Urn	175	96	4	2	1	1	2	1	182
Non-urn	16	84	3	16	0	0	0	0	19
Total									
Urn	1081	81	192	14	25	2	32	2	1330
Non-urn	165	75	44	20	10	5	0	0	219

on the distal humerus and proximal ulna. In the urn sample, degeneration was more common at the knee (21 percent) than at the wrist (19 percent), with only 4 percent of ankle joint surfaces showing degeneration. In the non-urn sample, degeneration was most common at the elbow (47 percent), followed by the wrist (31 percent), ankle (11 percent), and knee (9 percent). The most severe degeneration occurred on the distal femora and proximal tibiae of the urn sample where 8

and 5 percent respectively of the articular surfaces examined show stage 3 degeneration. None of the articular surfaces in the non-urn sample were in the stage 3 degree of severity. Although the urn sample shows a lower over-all frequency of articular surface degeneration, those examples present are more severe than in the non-urn sample.

Congenital Disorders

Disorders of congenital origin were found only in the vertebrae. Examples of congenital fusion of two adjacent cervical vertebrae were found in five features. Feature numbers and vertebrae involved are as follows: feature 11, C2 and C3; feature 23, between C3 and C7; feature 50, C2 and C3; feature 56, C2 and C3; feature 64, between C3 and C7. Radiographs reveal complete fusion of each pair with little osteophytic involvement. Four of the five features are urns; one example was found with an adult male primary skeleton.

One adult lumbar vertebra from feature 16 (urn) displays a separate neural arch. No other examples were found.

Lines of Increased Density

Additional data on morbidity in a skeletal population are provided by lines or bands of increased density, which appear in radiographs of long bones. Usually termed "Harris lines," the bands are produced by renewed long bone longitudinal growth following a period of growth arrest. These bands of increased density usually indicate periods of retarded growth, but only if renewed growth later occurred. As Garn et al. (1968) have summarized, these bands are not an exact indication of morbidity since lines sometimes appear in the absence of disease and may be produced by a wide range of phenomena. In adults, band frequency is minimal since some bands are lost through time due to remodeling. The problem is accentuated with fragmentary, incomplete, and secondary skeletons. Nevertheless, they provide at least a general indication of morbidity. When possible, radiographs were prepared for at least one long bone from each individual in a feature, usually a femur or tibia. Most complete long bones from primary skeletons were radiographed. Radiographs were prepared for 246 bones, 158 mature and 88 immature, representing 133 adults and 50 subadults. The adult bones are primarily femora (109) and tibiae (35), although humeri (6), clavicles (3), radii (2), fibulae (2), and one ulna were also examined radiographically. Subadult bones examined consist of 54 femora, 11 tibiae, 4 fibulae, 9 humeri, 5 radii, and 5 ulnae. Of the 133 adults, 15 (11 percent) show lines of increased density ranging from one to 10 per bone. Four (8 percent) of the 50 subadult individuals show lines, ranging in number from one to three. Lines in adult bones averaged 3.73 per individual, while subadults averaged 1.75 per individual. The greater frequency in adults obviously reflects the fact that an adult bone can display lines that may have occurred throughout the longitudinal growth period. Subadult bones show only a portion of that growth period, i.e., growth that occurred prior to the death of the individual.

Lines of increased density occurred with greater frequency among non-urn adults than those within urn features. Of 119 adults found within urns, 12 (10 percent) displayed 39 lines for an average of 3.25 per individual. Of 14 adults from non-urn features, three (21 percent) displayed 17 lines for an average of 5.67 lines per person. Note that all counts of lines are the maximum number revealed in any one bone of that individual.

The age of the individual at the time of line formation can be established by first estimating the length of the diaphysis at the time of line formation. Diaphysis length was estimated either by measuring the distance between corresponding proximal and distal lines on the same bone or by measuring the distance between a line and either the present end of the diaphysis in subadult bones or in adult bones where the epiphyseal line occurred before union. Once diaphyseal length was established, chronological age was estimated through comparison with data provided by Mer-

TABLE 59.—Estimated individual ages at time of formation of lines of arrested growth

Age interval	*No.*	*%*
0.0–0.9	7	11
1.0–1.9	3	5
2.0–2.9	5	8
3.0–3.9	5	8
4.0–4.9	6	9
5.0–5.9	6	9
6.0–6.9	4	6
7.0–7.9	12	19
8.0–8.9	4	6
9.0–9.9	3	5
10.0–10.9	3	5
11.0–11.9	1	2
12.0–12.9	3	5
13.0–13.9	0	0
14.0–14.9	1	2
Total	63	100

chant and Ubelaker (1977). The resulting age distribution is shown in Table 59. The table shows that lines formed in nearly every yearly interval from birth to 15 years with the greatest number of lines formed between 7 and 7.9 years. These data represent one indicator of morbidity in the population, although not an exact one since some lines may not have been detected in the fragmentary remains, some diseases may not have produced lines, some lines may have been produced independently of disease, and some lines may have been lost due to remodeling.

DENTAL DISEASE

Data were recorded for teeth present, teeth missing antemortem, carious lesions, alveolar abscesses, calculus and hypoplasia.

Deciduous Teeth

Data for deciduous teeth are presented in Table 60. No deciduous teeth were prematurely lost antemortem. Of 286 teeth examined, only eight (3 percent) display carious lesions. One shows calculus deposits on both the buccal and lingual surfaces and two display hypoplasia. Of the three tooth groups, the molars display nearly all caries, calculus, and hypoplasia. The positions of the two examples of hypoplasia on the molars suggest they were produced at about the time of birth. Of the 286 deciduous teeth examined, only 26 are from non-urn features. None of these display pathology.

Permanent Teeth

Table 61 summarizes observations of pathology on all permanent teeth recovered from all features. The number of teeth examined varies considerably since most of the features are secondary and the anterior teeth were frequently lost during the transfer. Frequencies of teeth missing antemortem represent only examples in which the alveolus was available for examination and displayed remodeling that clearly suggested the

TABLE 60.—Observations on deciduous teeth from all features

Teeth	*Present*	*Absent antemortem*	*Carious*	*Alveolar abscess*	*Calculus buccal*	*Calculus lingual*	*Hypoplasia*
Maxillary							
Incisors	45	0	0	0	0	0	0
Canines	22	0	1	0	0	0	0
Molars	102	0	4	0	0	0	2
Mandibular							
Incisors	10	0	0	0	0	0	0
Canines	10	0	0	0	0	0	0
Molars	97	0	3	0	1	1	0
Total	286	0	8	0	1	1	2

tooth had been lost before death. Percentages were calculated from the total number of observations made on that particular tooth group; e.g., the number of teeth present plus the number determined to be absent antemortem. In both the maxilla and mandible, the molars show the highest frequency of antemortem loss, followed by the incisors, premolars, and canines.

Data on caries presented in the table represent the frequency of teeth that display at least one carious lesion. Overall, maxillary teeth show about the same caries frequency as mandibular teeth (10 percent). In both maxillary and mandibular teeth, molars show the highest caries frequency, followed by the premolars.

Alveolar abscesses are more common in the maxilla (5 percent) than in the mandible (2 percent) and the distribution is different as well. Maxillary abscesses occur primarily in the incisors, followed by the canines and molars. Mandibular abscesses occur with greatest frequency in the molars followed by the premolars and then the canines. When present, calculus deposits were classified as slight, medium, or large. Absent indicates no trace of calculus occurs on any aspect of the tooth surface. Slight represents a minimal accumulation not exceeding 1 mm in thickness. Medium is scored when the calculus deposit measures between 1 and 2 mm in thickness. Large represents a deposit in excess of 2 mm, in thickness. Frequency calculations for calculus are based upon the number of observations for calculus made and not the number of teeth present. Some teeth were present but were damaged in a manner that observations of calculus could not be made.

The data show that calculus occurs with variable frequencies on both the buccal and lingual surfaces of all teeth groups. In the maxillary teeth, it is more common on the buccal surfaces than the lingual. In mandibular teeth, it occurs with greater frequency on the buccal sides of the incisors and canines, but on the lingual surfaces of the premolars and molars. In both the maxilla and mandible, calculus is more common in the anterior teeth than the posterior. The calculus probably represents normal salivary deposits, although lime used in coca chewing may also be a contributing factor. Chemical attempts to distinguish lime deposits from salivary calculus have not been successful (Klepinger et al., 1977).

For this study, hypoplasia is defined as enamel defects such as spotting or horizontal bands that may reflect disturbances in the tooth formation process. Like lines of increased density in long bones, hypoplasia is difficult to interpret since a wide variety of factors may contribute to its formation. They provide another inexact indica-

TABLE 61.—Frequency of dental disease in permanent teeth from all features (% refers to percentage of observations, A = absent, S= slight, M = medium, L = large).

Teeth	*Number present*	*Absent antemortem*		*Carious*		*Alveolar abscess*		*Calculus buccal (%)*				*Calculus lingual (%)*				*Hypoplasia*	
		No.	*%*	*No.*	*%*	*No.*	*%*	*A*	*S*	*M*	*L*	*A*	*S*	*M*	*L*	*No.*	*%*
Maxillary																	
Incisors	259	30	10	13	5	18	7	47	40	9	4	78	19	2	1	12	5
Canines	172	11	6	7	4	10	6	59	31	7	3	75	21	3	1	35	20
Premolars	310	32	9	33	11	10	3	75	21	3	1	90	10	0	0	12	4
Molars	442	87	16	68	15	19	4	72	22	3	2	90	10	0	0	9	2
Mandibular																	
Incisors	207	20	9	4	2	1	0	39	35	22	4	45	33	17	5	3	1
Canines	149	4	3	5	3	2	1	51	38	10	1	55	35	8	2	24	16
Premolars	373	33	8	25	7	8	2	76	21	2	1	55	38	7	0	14	4
Molars	483	181	27	88	18	19	4	85	12	1	2	81	16	2	1	12	2

tion of morbidity in the population. As Table 61 shows, hypoplasia was found in all tooth groups but most frequently in the canines where 20 percent of maxillary and 16 percent of mandibular canines showed hypoplastic defects. The position of the defect on the crown surface indicates the size of the developing tooth when the defect occurred. Comparison of defect position with data on the chronology of tooth formation (Ubelaker, 1978:112–113) allows an estimation of the age at which the defect developed. Of the 121 hypoplastic defects observed, four were formed at age one, six at age two, 31 at age three, 11 at age four, 66 at age five, one at age six, one at seven, and one at 11. Eighty percent of the defects are estimated to have formed at either age three or five.

Tables 62, 63, and 64 compare the frequency of dental disease in the urn sample with that found within the non-urn sample. The tables show that the urn sample has a higher frequency of antemortem loss of permanent teeth and of carious teeth, alveolar abscesses, and hypoplasia; the non-urn sample has a higher frequency of calculus deposits.

TABLE 62.—Frequency of antemortem loss of permanent teeth in urn and non-urn samples

Sample		*Teeth present*		*Teeth absent antemortem*	
	No. observations	*No.*	*%*	*No.*	*%*
Urn	2302	1966	85	336	15
Non-urn	491	429	87	62	13

TABLE 63.—Frequency of caries and alveolar abscesses in permanent teeth from urn and non-urn samples

Sample	*No. teeth*	*Carious*		*Alveolar abscess*		*Hypoplasia*	
		No.	*%*	*No.*	*%*	*No.*	*%*
Urn	1966	208	11	74	4	115	6
Non-urn	429	35	8	13	3	6	1

TABLE 64.—Frequency and severity of calculus deposits on permanent teeth from urn and non-urn samples

Sample	*No. observ.*	*Absent*		*Slight*		*Medium*		*Large*	
		No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Buccal surface									
Urn	1944	1374	71	437	22	92	5	41	2
Non-urn	423	232	55	142	34	43	10	6	1
Lingual surface									
Urn	1939	1486	77	368	19	67	3	18	1
Non-urn	423	271	64	125	30	25	6	2	<1

DEMOGRAPHY

Accurate demographic reconstruction requires samples that reflect the actual distribution of deaths in the population. As with most samples taken from large cemeteries, there is no positive assurance that these are not biased, at least to some extent by such factors as preservation, burial practices or inadequate sampling of a spatially variable cemetery. As the bone inventories for individual urns reveal, there was considerable loss of some skeletal parts, especially small bones, due to preservation or selection when the bones were transferred from the primary repository to the urns. The inventory of all bones recovered in the urns (Tables A50 and A102) reveals 147 adult individuals represented by right humeri, while only 19 are represented by the right lesser multangular. For subadults, 140 individuals are represented by right femora, while only seven are represented by the right talus. This variability is expected, since small bones would have been easily overlooked or not judged to be important when the transfer to the urns was made.

The approach to demographic reconstruction used here is to assume that each feature represents a distinct demographic unit; e.g., that bones of each individual are confined to one feature. The number of individuals and the age and sex data were calculated using the information provided in the individual feature analyses (pages 14–90). It is reassuring that both sexes, all age intervals, and the expected large percentage of deaths between ages birth and five years are

TABLE 65.—Life table for the urn sample

Age interval (x)	*No. of deaths* (Dx)	*% of deaths* (dx)	*Survivors* (lx)	*Probability of death* (qx)	*Total no. yrs. lived during x* (Lx)	*Total no. yrs. lived after lifetime* (Tx)	*Life expectancy* ($e^{o}x$)
0–0.9	96	25	100	.25	88	2257	23
1.0–4.9	51	13	75	.18	274	2170	29
5.0–9.9	18	5	62	.08	297	1896	31
10.0–14.9	20	5	57	.09	272	1600	28
15.0–19.9	5	1	52	.03	256	1327	26
20.0–24.9	15	4	51	.08	243	1072	21
25.0–29.9	21	6	47	.12	219	829	18
30.0–34.9	19	5	41	.12	193	609	15
35.0–39.9	45	12	36	.32	152	416	11
40.0–44.9	32	8	24	.34	102	264	11
45.0–49.9	23	6	16	.37	66	163	10
50.0–54.9	12	3	10	.31	43	97	10
55.0–59.9	9	2	7	.33	30	54	8
60.0–64.9	12	3	5	.67	16	25	5
65.0–69.9	2	1	2	.33	7	9	6
70.0–74.9	4	1	1	1.00	3	3	3
75.0–79.9	0	0	0	0	0	0	0

TABLE 66.—Life table for the non-urn sample

Age interval (x)	*No. of deaths* (Dx)	*% of deaths* (dx)	*Survivors* (lx)	*Probability of death* (qx)	*Total no. yrs. lived during x* (Lx)	*Total no. yrs. lived after lifetime* (Tx)	*Life expectancy* ($e^{o}x$)
0–0.9	15	29	100	.29	85	1942	19
1.0–4.9	6	12	71	.17	259	1857	26
5.0–9.9	2	4	59	.07	284	1598	27
10.0–14.9	0	0	55	.00	275	1314	24
15.0–19.9	1	2	55	.04	270	1039	19
20.0–24.9	3	6	53	.11	250	770	15
25.0–29.9	7	14	47	.29	201	520	11
30.0–34.9	7	14	33	.41	132	319	10
35.0–39.9	2	4	20	.20	88	186	10
40.0–44.9	3	6	16	.38	64	98	6
45.0–49.9	4	8	10	.80	29	34	4
50.0–54.9	1	2	2	1.00	5	5	3
55.0–59.9	0	0	0	0	0	0	0

present, indicating that the sample has not been grossly effected by the sampling problems discussed above.

The data indicate that at least 435 individuals are represented in the skeletal remains removed for analysis. For subadults, ages at death were estimated for each individual and these data were directly available for demographic reconstruction. For many of the adults, however, exact age at death could not be determined. For example,

inventories of urn features revealed that at least 194 adults are present, but exact ages were estimated for only 133. The remaining 61 are classified as adult, age unknown. To include the entire adult sample in the analysis, the distribution of adults with estimated ages was first determined, by calculating the percentage of that sample that occurred in each five-year interval. The number of adults of unknown age (61) was then multiplied by the percentage figure for each interval and the product was added to each respective interval. This procedure assumes that adults of unknown age have the same age distribution as adults with estimated ages.

Life tables calculated from the age at death data are presented in Table 65 for urn features and Table 66 for non-urn features. Data presented in the tables are rounded to whole numbers for clarity of presentation and do not imply unreasonable accuracy. In the actual calculation of the tables, however, figures to the eighth decimal were used to avoid accumulative rounding error. Tables were calculated following procedures outlined by Acsádi and Nemeskéri (1970) and Ubelaker (1978). The tables show greater life expectancy for the urn sample than the non-urn sample. In the urn sample, life expectancies at birth and at age 15 are 23 and 26 years respectively; in the urn sample, the values are both 19 years. The urn sample shows lesser infant mortality and greater adult longevity than the non-urn sample. Crude mortality rates are 44 for the urn sample and 52 for the non-urn sample. Maximum age in the urn sample was estimated at 71 years while it was 53 in the non-urn sample. For the urn sample, the average age of all individuals age 15 years or more is 40; for the non-urn sample, the figure is 34 years.

In the urn sample, sex was estimated for 88 adults: 43 males and 45 females. Male ages at death ranged from 17 to 71 years with a mean age at death of 36 years. Female ages at death ranged from 15 to 61 years with a mean age at death of 40 years. In the non-urn sample, sex was estimated for 24 adults. Of these 12 are male and 12 are female. Male ages at death ranged from 18 to 53 with a mean age of 36 years. Female ages at death ranged from 22 to 49 with a mean age at death of 31 years. Comparative mortality data for males and females are presented in Table 67. Male longevity differs little, if any, between urn and non-urn samples. Female longevity however is much greater in the urn sample.

TABLE 67.—Percentage of adult deaths in five-year age intervals of males and females from urn and non-urn samples

Age interval	*Urn*		*Non-urn*	
	Male	*Female*	*Male*	*Female*
15–19	7	2	8	0
20–24	7	7	0	27
25–29	12	11	17	37
30–34	12	4	25	0
35–39	28	25	0	18
40–44	21	18	17	9
45–49	2	18	25	9
50–54	7	4	8	0
55–59	2	4	0	0
60–64	0	7	0	0
65–69	0	0	0	0
70–74	2	0	0	0

Urn/Non-Urn Feature Comparison

ARTIFACTS

Although the urn and non-urn features may be chronologically distinct and represent very different methods of burial, they share considerable cultural and biological data. With regard to ceramics, both samples have jars, compoteras, spindle whorls, and small discs. Only the urns themselves are distinct ceramic artifacts unique to the urn features. Similarly, most metal artifacts were found in both urn and non-urn features, with just four elaborate ring types occurring only in urns. The most distinctive feature differences occur with bead types where types K and P are unique to non-urns; types A, D, F, G, and I are shared by urn and non-urn features; and the remaining nine types are unique to the urns.

Faunal Remains

Most associated faunal groups are shared by both urn and non-urn features. Remains of a marsupial (one specimen), all reptiles, and the bird taxa *Cairina*, *Numenius*, *Dendrocygna*, *Columba*, *Netta*, and Anatidae were recovered only in urns, while isolated deer heads and the bird taxa *Rallus* and Charadriidae are unique to non-urn features. The percentage of features with cavy rodent remains shifted from 40 percent in urn features to 15 percent in non-urn features. The frequency of features with Muscovy duck remains also decreased from 24 percent of urn features to 4 percent of non-urn features.

Biological Information

Biological data shared equally by urn and non-urn features consist of cranial deformation, measurements of undeformed crania, living stature, and frequency of porotic hyperostosis. Urn features show higher frequencies of metatarsophalangeal alterations, vertebral osteophytosis, arthritic lipping at the knee, dental caries, alveolar abscesses, hypoplasia, and skeletal evidence of infectious disease. The urn features also uniquely contained rodent tooth marks and the one example of dental mutilation. The urn samples suggest greater life expectancy at birth, lower infant mortality, and greater adult life expectancy, especially in females.

Non-urn samples show a higher frequency of joint degeneration (although less severe examples), dental calculus, lines of increased density in long bones and healed fractures.

Sex Associations

Data on male-female artifact associations are confined largely to non-urn features since artifacts could not be associated with specific individuals within the secondary urn burials. Within the non-urn features all artifact classes were found with both sexes. This is somewhat surprising since most other prehistoric American cemetery analyses have found at least some sexual differences in artifact mortuary inclusions. Even rings worn on the nose and/or ears occurred with both sexes.

Some sexual differences were found in associated faunal remains. Single specimens of the cotton rat and three bird genera (*Cairina*, *Dendrocygnus*, *Rallus*) were found with one 25 to 30 year old female. The deer skull occurred with a young adult male. One humerus of the bird genus *Geotrygon* was found with an old adult male. Of course it is not possible to suggest any sexually discriminating mortuary ritual from the single examples cited here. The only faunal remains clearly associated with subadult skeletons were the fish fragments, cotton rat bones, and the *Lama astragalus* associated with the infant in feature 41.

Sex differences do occur in the biological data. Male living stature (159 cm) was greater than that of the females (149 cm). The only example of dental mutilation occurred on a male skull. Metatarsophalangeal alterations occurred more commonly if not exclusively on females. Adult life expectancy was greater for males in the non-urn sample, but greater for females in the urn sample.

Spatial Analysis

The spatial distribution of artifacts and biological data was examined by plotting the location of each variable within the excavation. The results were entirely negative; i.e., non-random patterns did not emerge, outside of the clustering of urn and non-urn features shown in Figure 5. Since no patterns emerge, the locational plots are not reproduced here. The randomness of these data adds further evidence that the material excavated is representative of the entire cemetery site.

Summary

Archeological features of the Ayalán cemetery, particularly the urn burials with inverted urn coverings, and the associated metal artifacts appear very similar to those reported from other cemetery sites in Ecuador from the Milagro Phase of the Integration Period. Most of these cemetery

sites (summarized on pages 3–9) display a pattern of multiple urn burials clustered on natural hilltops or in artificially constructed mounds. The arrangements of the urns vary considerably from seemingly random clusters of urns, such as those at Ayalán and Mound "B" of La Compañía to the symmetrical pattern at Gante. Individual urn features vary from single urns, sometimes with single inverted urn coverings (Ayalán, Cerro de Chaco, Loma de los Navanjos), to the elaborate multiple "chimney-type" arrangement described at Quevedo I, Quevedo II, Gante, Tierra Santa, and La Compañía.

At Quevedo I, Tola de Piñuelal (La Loma de Oro), and Ayalán, primary skeletons were found buried outside of the urns. It is not clear if this represents variability in mortuary procedures at a particular time, or if the urns and primary burials represent chronologically distinct mortuary procedures. Radiocarbon dates at Ayalán suggest the latter, although even these data may be questionable considering the possibility of organic contamination of charcoal and collagen samples used in dating, and the impressive similarity in cultural and biological data between the urn and primary skeleton samples. Much more information is needed from other Milagro cemetery sites before these problems can be resolved.

Information about the skeletal content of urns from these sites is limited to two sites, La Compañiá and Ayalán. The eroded fragmented skeletons salvaged from La Compañía offer few measurements and biological observations but show that both sexes and all ages are present in the urns. A minimum estimate of 33 individuals from 24 features suggests that most urns contained more than one individual. Since bone decomposition was excessive at this site, the number of skeletons originally present was certainly much greater.

At Ayalán, improved bone preservation and careful excavation provides considerably more information on archeological details of urn burial and on the biology of the skeletal samples. Improved bone preservation allowed the determination that each urn contained an average of over nine persons. Most of the bones were secondary, although a few articulated skeletal parts were found. The articulated bones represent all parts of male and female skeletons of all ages, but especially bones of the vertebral column, legs, and feet. The amount of bone in the urns correlates significantly with the size (especially height and volume) of the urns, suggesting that either the urns were made or selected to accomodate the quantity of dead to be buried or that deceased individuals or bones were accumulated to the needed quantity for the size of the urn available for use.

The secondary nature of most of the skeletal remains indicates that the mortuary procedure included a primary repository, although it can not be determined if it was above or below ground. In some cases, the mortuary procedure prior to urn burial varied to include cremation of both whole bodies and dry bones. The pattern of firing on some of the bones indicates that the bodies were cremated with the dorsal body surface exposed to the crematory fire. The presence of human bone trapped between the inverted urn covering and lower upright urn in two features indicates that the urn coverings may have been used to transport the skeletal remains from the primary repository for placement within the upright urn. The distribution of ages and sexes of the skeletal samples within each of the urns may indicate that extended families are represented.

Artifact comparisons between the urn and non-urn samples show few differences. Only the urns themselves, elaborate rings, eleven bead types, and several types of faunal remains separate the two samples. The over-all cultural comparison suggests relatively little change within the time period represented.

Biological analysis of the Ayalán remains reveals populations with high and very broad crania and short stature. Comparison of urn samples and the possibly earlier non-urn samples shows an increase through time in cranial deformation, metatarsophalangeal alterations, vertebral osteophytosis, arthritic lipping at the knee, dental caries, alveolar abscesses, hypoplasia, evi-

dence of infectious disease, and life expectancy. Many of these changes (especially dental pathology and arthritic problems) may be brought about by an increased dependency upon intensive agriculture. Unfortunately we lack sufficient data regarding subsistence and bone pathology at other Milagro Phase and earlier sites to allow comparison.

Population estimates can not be made with any reliability from the skeletal remains due to the variables involved. For the urn sample, the crude mortality rate (44) and number of individuals recovered from the excavated urns (287) are known. Unknown variables such as the size of the unexcavated area of the cemetery, exact number of years represented by the cemetery's use, and the geographical range of the population that contributed to the cemetery need to be resolved before population size estimates can be made. A substantial population must have existed in Guayas and Los Ríos provinces during the Late Integration Period; however, a more exact determination of population size must await additional archeological survey and excavation.

The data presented here provide only an initial glimpse at the biological and cultural variability present in the Milagro Phase of the Integration Period. Comparative data are urgently needed from other cemetery sites in Ecuador and throughout South America. At this time, comparative data are simply not available in the published record, due to the lack of controlled cemetery excavation, the lack of field observations by physical anthropologists trained in skeletal biology, the lack of publication of field work and research already completed, and the lack of detail in published reports. Such additional data would document the temporal and spatial variability of aboriginal funerary behavior and human biology and would provide the foundation to address even larger questions involving biocultural adaptation and evolution.

Appendix I

The Association of Animal Bones with Burial Features

Brian Hesse

Excavation in the cemetery at Ayalán recovered small quantities of animal bone in association with the human skeletal material. This report describes the identification and distribution of that meterial.

Taxa Represented in the Sample

Many of the burials included fragments of fish bone, marine shells, and crab claws. Small quantities of amphibians and reptiles were also present.

By far the most common of the birds is the Muscovy Duck, *Cairina moschata*, a large forest duck, which was most likely a domesticated species at Ayalán. Two other forms of Anatidae have been identified. Several bones appear to be *Dendrocygna* sp., a tree- or whistling-duck. The more complete bone fragments compare best with *D. autumnalis discolor*, the Black-bellied Whistling-Duck, a species recorded for the Ecuadorian coastal area (Blake, 1977:216–218). One tarsometatarsus conforms to *Netta* sp., a pochard that prefers lagoons and marshes with dense vegetation, a habitat preference shared with the whistling-ducks. One species of Scolopacidae, the Whimbrel or Hudsonian Curlew (*Numenius phaeopus*), is present. This crow-sized coastal marsh bird would have been an occasional winter visitor to the Ecuadorian coast. Several bones of *Rallus longirostris*, the Clapper Rail, are found in the collection. This bird prefers mangrove swamps or marshes. One femur of some form of small plover (Charadriidae) is present. Two forms of the Columbidae (pigeons and doves) have been noted. One seems to be *Columba plumbea*, the Plumbeous Pigeon, while the other is apparently *Geotrygon* sp., a quail-dove.

Two species of rodent are present. The existence of several partial skeletons in the collection permit the identification of much of the postcranial material. The more common of the two is the cavy, *Cavia* sp. Most probably this material can be referred to the domestic guinea pig, *Cavia porcellus*, an animal with a long history of use on the western coast of South America (Wing, 1977). The other rodent in the collection is the cotton rat, *Sigmodon* sp. Of the two groups of these rodents, the most likely species is *S. hispidus*, a common resident of grassy areas, which, if established, frequently becomes the dominant rodent species (Hall and Kelson, 1959:671).

Two specimens from a marsupial, probably *Marmosa* sp., are present.

Three large herbivores were identified in the animal bone collection. The most common is some form (or forms) of camelid, *Lama* sp. Due to the difficulty of separating guanaco, llama, alpaca, and vicuña osteologically, more specific identification was not possible (Wing, 1972). Less common was the white-tail deer, *Odocoileus virginianus*. A lower third molar of *Equus* sp. (horse, donkey, or mule) was recovered but is probably intrusive. In addition to these three, a fourth category, *Lama/Odocoileus*, was created to record those large mammal specimens that can not be further identified.

Most of the carnivore specimens can be identified as *Canis familiaris*, and probably came from small individuals. A few other carnivore specimens belong to animals of weasel size.

The following listing describes the faunal remains associated with each of the cemetery features.

Feature 1 (urn)
- Fish: 48 fragments
- Marine shells: 1
- Rodents
  - *Sigmodon hispidus*: 1 femur, 1 tibia
  - Unidentified: 1 humerus
- Small mammal (carnivore?) 1 distal metapodial

Feature 5 (urn)
- Fish: 3 fragments
- Rodents
  - *Cavia porcellus*: 2 mandibles, 2 maxillae, 2 cranial fragments, 1 humerus

Feature 6 (urn)
- Birds
  - *Cairina moschata*: 1 coracoid, 1 femur, 1 radius, 1 tibiotarsus
  - Unidentified family: 1 phalanx
- Rodents
  - *Cavia porcellus*: 2 mandibles, 2 maxillae, 4 cranial fragments, 1 humerus, 2 femora, 1 tibia
- Small mammal (carnivore?) 1 astragalus
- Mammal bone fragments (*Lama* sp.?): 6

Feature 7 (urn)
- Carnivores
  - *Canis familiaris*: 1 immature left ulna, 1 fragment of occipital, 2 cranial fragments

Feature 8 (urn)
- Fish: 3 fragments
- Birds
  - *Cairina moschata*: 1 humerus, 1 femur, 1 tarsometatarsus
- Rodents
  - *Cavia porcellus*: 1 mandible, 2 femora

Feature 9 (non-urn)
- Fish: 6 fragments
- Marine shells: 1
- Crab: 1 claw
- Birds
  - ?*Geotrygon* sp.: 1 humerus
- Rodents
  - Unidentified: 1 scapula, 1 rib

Feature 10 (urn)
- Rodents
  - *Cavia porcellus*: 1 femur
- Herbivores
  - *Odocoileus virginianus*: 1 immature right ulna

Feature 12 (non-urn)
- Fish: 4 fragments
- Rodents
  - *Cavia porcellus*: 1 femur
- Herbivores
  - *Lama* sp.: 1 second phalanx (whole immature diaphysis), 1 vertebra fragment

Feature 13 (urn)
- Birds
  - *Cairina moschata*: 1 ulna, 1 tarsometatarsus
  - Unidentified family: 1 phalanx

Feature 14 (urn)
- Fish: 16 fragments
- Birds
  - *Cairina moschata*: 1 coracoid
- Herbivores
  - *Lama/Odocoileus*: 1 rib, 1 lumbar vertebra fragment
- Mammal bone fragments: 1

Feature 16 (urn)
- Small mammal (carnivore?) 1 mature proximal left tibia

Feature 21 (urn)
- Fish: 5 fragments
- Marine shell: 2
- Lizard: 1 partial skeleton including 1 mandible, 2 cranial fragments, 5 vertebrae, 1 innominate, 2 femora, and 1 humerus; also 2 femora, 2 tibiofibulae
- Birds
  - *Cairina moschata*: 3 humeri, 3 ulnae, 1 radius, 2 femora, 2 coracoids, 2 tibiotarsals, 2 carpometacarpals, 1 tarsometatarsus
  - ?*Cairina moschata*: 6 vertebrae, 2 phalanges, 2 clavicles
- Rodents
  - *Cavia porcellus*: 2 maxillae, 1 mandible, 1 femur, 1 humerus
  - *Sigmodon hispidus*: 1 mandible, 1 humerus, 6 femora, 2 tibiae
- Herbivores
  - *Lama* sp.: 1 lower left mandible, mandibular m3, 4 unerupted molars, 3 maxillary deciduous molars, 1 incisor, 1 tooth fragment, 1 mandibular symphysis
- Mammal bone fragments: 13

Feature 22 (urn)
- Birds
  - *Cairina moschata*: 1 carpometacarpus, 2 femora, 1 tarsometatarsus, 1 tibiotarsus
  - *Numenius phaeopus*: 1 femur, 2 humeri
- Herbivores
  - *Lama/Odocoileus*: 3 fragments of one metatarsal
- Mammal bone fragments: 3

Feature 23 (urn)
- Marine shells: 2
- Lizard: 1 vertebra, 2 femora, 3 tibiofibulae
- Rodents
  - *Cavia porcellus*: 1 humerus, 1 tibia

Feature 24 (urn)
- Birds
  - *Cairina moschata*: 1 ulna, 2 femora, 1 tarsometatarsus, 1 tibiotarsus
  - ?*Dendrocygnus* sp.: 1 tarsometatarsus
  - *Columba plumbea*: 1 femur, 1 humerus
  - Unidentified family: 3 shaft fragments
- Rodents
  - *Cavia porcellus*: 1 femur, 2 humeri
- Mammal bone fragments: 4

Feature 25 (urn)
- Snake: 1 vertebra

- Birds
  - *Cairina moschata*: 3 humeri, 2 carpometacarpi, 2 femora, 2 tarsometarsi, 3 tibiotarsi
  - *Dendrocygnus* sp.: 1 coracoid
  - ?*Dendrocygnus* sp.: 2 femora, 1 humerus
  - ?*Netta* sp.: 1 tarsometatarsus
  - Small Anatidae: 2 tibiotarsi
  - *Columba plumbea*: 1 humerus
  - Unidentified family: 3 vertebrae fragments, 1 shaft fragment
- Rodents
  - *Cavia porcellus*: 2 mandibles, 1 maxilla, 1 tibia, 1 innominate
  - *Sigmodon hispidus*: 1 femur
- Small mammal: 1 humerus
- Herbivores
  - *Lama* sp.: 1 partial skull and jaws including: 9 mandible fragments, 1 right mandible with third molar, 1 mandibular symphysis, 1 mandibular premolar fragment, 2 maxillae with second and third deciduous molars, 2 maxillary first molars with irregular wear (only on anterior portion of occlusal surface), 1 unerupted maxillary right second molar, 1 incisor, 5 tooth fragments, 2 occipital fragments, 1 rib fragment

Feature 26 (urn)
- Fish: 8 fragments
- Marine shells: 3
- Crab: 5 claws
- Rodents
  - *Cavia porcellus*: 1 mandible, 1 cranial fragment, 2 femora, 1 tibia
- Small mammal: 1 cranial fragment
- Herbivores
  - *Lama* sp.: 1 atlas, 1 left calcaneus, 1 left astragalus (burned), 1 right mandible (M1 in wear), 1 mandibular left M1/2 in wear, 1 incisor, 1 ascending ramus
- Mammal bone fragments (*Lama* sp.?): 50
- Bone tool: 1 bone shaft fragment with two drilled holes

Feature 27 (urn)
- Fish: 3 fragments
- Crab: 1 claw
- Birds
  - *Cairina moschata*: 1 humerus, 3 carpometacarpi, 2 ulnae, 1 femur, 4 radii, 1 tarsometatarsus
  - Unidentified family: 3 vertebrae fragments, 2 clavicles
- Rodents
  - *Cavia porcellus*: 3 mandibles, 2 femora, 1 tibia
  - *Sigmodon hispidus*: 1 mandible
- Small mammal: 1 fragment
- Mammal bone fragments: 9

Feature 28 (non-urn)
- Fish: 3 fragments
- Mammal bone fragments: 2

Feature 30 (urn)
- Fish: 23 fragments
- Marine shells: 1
- Crab: 2 claws
- Birds
  - Unidentified family: 1 phalanx
- Rodents
  - *Cavia porcellus*: 5 mandibles, 1 molar, 2 cranial fragments, 7 femora, 6 tibiae, 5 innominates, 5 humeri
  - *Sigmodon hispidus*: 1 maxilla, 1 innominate, 1 tibia, 2 femora
- Small mammal: 1 first phalanx
- Herbivores
  - *Lama* sp.: 1 hyoid, 4 incisors
- Mammal bone fragments: 4

Feature 31 (urn)
- Fish: 1 fragment
- Rodents
  - *Cavia porcellus*: 1 femur
  - *Sigmodon hispidus*: 2 femora

Feature 32 (non-urn)
- Fish: 15 fragments
- Crab: 3 claws
- Rodents
  - *Cavia porcellus*: 1 innominate
- Small mammal: 1 first phalanx, 1 shaft fragment

Feature 33A (non-urn)
- Fish: 25 fragments
- Crab: 3 claws
- Carnivores
  - *Canis familiaris*: 1 right femur (complete, mature, cut marks below rim of caput femoris on shaft)
- Herbivores
  - *Lama* sp.: 1 distal immature complete right femur, 2 vertebrae fragments, 1 immature first phalanx diaphysis
- Mammal bone fragments: 4

Feature 33B (non-urn)
- Fish: 47 fragments
- Crab: 1 claw
- Birds
  - Charadriidae: 1 femur
- Rodents
  - *Sigmodon hispidus*: 4 femora, 1 tibia
- Herbivores
  - *Lama/Odocoileus*: 3 rib fragments
- Small mammal (carnivore?): 1 metatarsal

Feature 33C (non-urn)
- Fish: 6 fragments
- Crab: 1 claw
- Herbivores
  - *Lama* sp.: 1 partial skull and jaws including: 2 mandibles, each with m2 m3 M1 M2(erupting), 5 incisors; 2 maxillae, each with m2 m3 M1; 1 unerupted maxillary M2; 2 occipital condyles; 2 petrous portions; 1 fragment of basal part of skull; 1 hyoid; 67 cranial fragments

Feature 35 (non-urn)
Fish: 2 fragments
Herbivores
Lama sp.: 2 incisors
Small mammal: 2 distal metapodials
Feature 37D–E (non-urn)
Small mammal (carnivore?): 1 ulna, fetal or neonatal
Mammal bone fragments: 2
Feature 41 (non-urn)
Fish: 17 fragments
Marine shells: 3
Rodents
Sigmodon hispidus: 1 femur, 1 tibia, 1 innominate
Herbivores
Lama sp.: 1 astragalus
Feature 42 (non-urn)
Marine shells: 3
Carnivores
Canis familiaris: 1 partial skeleton including: 1 left mandible, 1 petrous, 1 occipital condyle, 5 cranial fragments, 6 proximal ribs, 12 rib fragments, 1 axis, 1 atlas, 5 cervical vertebrae, 5 thoracic vertebrae, 1 lumbar vertebra, 1 right ilium, 1 right scapula, 1 left scapula, 1 right humerus, 1 left humerus, 1 right radius, 1 left radius, 1 left ulna, 2 metacarpal II, 2 metacarpal III, 1 metacarpal IV, 1 metacarpal V, 2 metapodial shaft fragments
Herbivores
Lama sp.: 1 partial skull and jaws including: 1 left mandible, 1 right mandible, (both have m2 m3 M1, left has M2 in the crypt), 2 ascending rami, 2 mandibular condyles, 1 right maxilla, 1 left maxilla (m2 m3 M1), 6 incisors, 2 occipital condyles, 2 petrous portions, 10 cranial fragments, most of the basal portion of the skull, 4 hyoid fragments
Mammal bone fragments: 27 (mostly *Lama* sp.)
Feature 48 (non-urn)
Fish: 1
Marine shells: 6
Birds
Cairina moschata: 1 radius
?*Dendrocygnus* sp.: 1 femur
Rallus longirostris: 2 tibiotarsals, 1 carpometacarpus
Unidentified family: 1 phalanx, 1 shaft fragment
Rodents
Cavia porcellus: 1 humerus, 1 ulna
Sigmodon hispidus: 1 femur
Herbivores
Lama sp.: 1 partial skull and jaws including: 2 mandibles (left P4 M1 M2 M3, right M1 M2 M3, all in wear), 36 cranial fragments, 2 petrous portions, 2 temporal fragments, 3 fragments of the basal portion of the skull, 2 occipital condyles (the right mandible shows a diseased portion on its lingual surface adjacent to M3)
Mammal bone fragments: 1
Feature 49 (non-urn)
Marine shells: 2
Rodents
Cavia porcellus: 1 mandible, 1 vertebra, 2 femora, 2 tibiae, 4 humeri, 1 radius, 1 scapula
Herbivores
Odocoileus virginianus: 1 partial cranium and jaws, cranium fragmented but mostly restorable, mandibles (P2 P3 P4 M1 M2 M3 all in wear), 2 hyoids (the animal had shed its antlers)
Feature 51 (urn)
Herbivores
Lama sp.: 1 partial skull and jaws including: 40 cranial fragments, 2 maxillae, 2 hyoids, 1 left temporal and petrous portion, most of the basal portion of the skull, 2 occipital condyles, 4 fragments of frontal, 2 mandibles (both are portions of tooth row without the mandibular symphysis), 1 incisor, 1 fragment of unerupted molar; also 5 rib fragments
Feature 52 (urn)
Fish: 1 fragment
Amphibian: 1 tibiafibula
Rodents
Cavia porcellus: 1 mandible, 1 cranial fragment, 1 vertebra, 3 femora, 1 humerus
Feature 56 (urn)
Rodents
Cavia porcellus: 1 femur
Herbivores
Lama sp.: 1 partial skull including: 2 maxillae (P2 P3 M1 M2), 2 cranial fragments, 1 mandibular M1/2, 1 vertebra fragment
Feature 58 (upper urn)
Lizard: 1 femur
Birds
Unidentified family: 1 synsacra, 1 shaft fragment
Rodents
Cavia porcellus: 3 mandibles, 1 maxilla, 2 femora, 1 innominate
Unidentified: 1 humerus
Feature 58 (lower urn)
Herbivores
Lama sp.: 1 maxillary M1/2 in wear, 1 mandible fragment
Feature 60 (urn)
Fish: 2 fragments
Birds
Cairina moschata: 1 tibiotarsus, 1 coracoid
Feature 61 (urn)
Fish: 2 fragments
Lizard: 1 sacra
Snake: 24 vertebrae
Birds
Dendrocygnus sp.: 1 tarsometarsus, 1 ulna, 3 humeri

Unidentified family: 1 clavicle, 1 shaft fragment
Rodents
Cavia porcellus: 5 mandibles, 3 maxillae, 1 molar, 6 femora, 2 tibiae, 4 innominates, 3 humeri, 1 ulna
Sigmodon hispidus: 4 mandibles, 2 maxillae, 2 innominates, 2 femora, 1 tibia
Marsupials
Marmosa sp.: 1 mandible, 1 humerus
Herbivores
Lama sp.: 1 complete mature left humerus
Feature 69 (urn)
Fish: 3 fragments
Rodents
Cavia porcellus: 1 mandible
Herbivores
Odocoileus virginianus: 1 upper molar (very worn)

Discussion

Several observations can be made about this animal bone collection.

1. Several of the bird species (the Black-bellied Whistling-Duck, the Whimbrel, the Clapper Rail, and the pochard) together with the fish and molluscs, point to the exploitation of a marshy seacoast environment. The cotton rat suggests nearby grassland.

2. The camelid(s) along with the Muscovy Duck were outside their wild range; the guinea pig also was probably domestic. The record of the Muscovy Duck is particulary significant, for while it is known from historic records as a New World domesticate (Gilmore 1950:460–462), I have found only one other report of the species in an archeological context (Wetmore 1935:329). Reed (1977:939–940) also notes this lack.

3. The bulk of these animal bone associations with human burials do not seem to represent the deposit of food refuse. (They are comparable to those reported by Reiss and Stübel, 1880–1887, plates 117–119.) The camelids and deer are represented by skull and mandible fragments in most cases. The birds were represented by wing and leg bones rather than the fragments of axial parts often found in food debris.

4. The birds represented in the deposit do not have particulary colorful plumage though they still may have served as decorative devices.

Table 68.—Frequency of animal bone categories among all burial features (number of urn features displaying specific faunal associations as a percentage of all fully excavated features)

Animal bone	*Urn features*		*Non-urn features*	
	No.	*%*	*No.*	*%*
Fish				
>10 fragments	3	7	3	12
<10 fragments	11	26	5	19
Crab	3	7	3	12
Reptile/amphibian	6	14	0	0
Bird				
Muscovy Duck	10	24	1	4
Other	9	21	3	12
Rodent				
Guinea pig	17	40	4	15
Other	7	17	4	15
Marsupial	1	2	0	0
Camelid				
(head)	7	17	4	15
(post-cranial)	5	12	3	12
Deer				
(head)	1	2	1	4
(post-cranial)	1	2	0	0
Dog	1	2	2	8

5. Of the 68 burial features that were fully excavated, 37 (54 percent) contained faunal associations. The frequency of faunal association in the 42 urn burials is 60 percent while the frequency in the 26 non-urn burials is 42 percent. Table 68 indicates the distribution of several types of faunal association. The fish remains are arbitrarily divided into greater than and less than 10-fragment categories. Marine shells are not considered. In the cases of the camelids and deer, those associations that included the cranial parts are kept separate from those with only post-cranial fragments. The *Lama/Odocoileus* bones are ignored as are those of indeterminate mammals.

The most important variations between urn and non-urn associations occur with regard to the guinea pig and the Muscovy Duck. Both are considerably more common in the urn burials.

Appendix II

Frequency of Each Type of Human Bone by Features

Tables A1–A51 show number of individuals represented by each type of adult bone within stated feature (actual number of bones in parentheses). Tables A52–A102 show number of individuals represented by each type of subadult bone within stated feature (actual number of bones in parentheses).

TABLE A1.—Feature 2

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	–
Humerus	7	7	Hamate	–	2
Radius	5	6	Metacarpals		
Ulna	6	6	1	3	8
Femur	5	8	2	2	2
Tibia	6	6	3	6	4
Fibula	4	2	4	3	1
Irregular Bones			5	–	–
Clavicle	5	3	Phalanges		
Scapula	5	5	Proximal 1-5	2(19)	
Temporal	3	3	Middle	1(5)	
Maxilla	2	2	Distal 1-5	1	
Mandible	7	7	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	2		Calcaneus	5	4
Innominate	2	4	Talus	5	7
Patella	2	7	Cuboid	1	2
Rib	2(35)		Navicular	6	5
Vertebrae			Cuneiforms:		
Cervical			1	2	4
1	4		2	1	1
2	3		3	1	–
3–7	5(23)		Metatarsals		
Thoracic	5(55)		1	6	5
Lumbar	5(21)		2	2	3
Sacrum	–		3	6	5
Hand Bones			4	5	5
Carpals			5	1	5
Navicular	1	–	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	4(8)	
Pisiform	–		2-5	1(3)	
Greater Multangular	–	1	Middle	–	
Lesser Multangular	–	–	Distal	(1)	

TABLE A2.—Feature 4

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	1
Humerus	4	3	Hamate	–	1
Radius	2	2	Metacarpals		
Ulna	2	1	1	–	2
Femur	5	4	2	1	4
Tibia	4	2	3	2	4
Fibula	– 2(3)	–	4	1	1
Irregular Bones			5	–	2
Clavicle	3	1	Phalanges		
Scapula	4	5	Proximal 1-5	2(17)	
Temporal	5	6	Middle	1(8)	
Maxilla	6	6	Distal 1-5	1(3)	
Mandible	6	6	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	1		Calcaneus	3	2
Innominate	3	3	Talus	3	3
Patella	4	1	Cuboid	2	1
Rib	1(16)		Navicular	3	2
Vertebrae			Cuneiforms:		
Cervical			1	1	3
1	1		2	3	–
2	2		3	3	1
3–7	2(9)		Metatarsals		
Thoracic	2(13)		1	3	2
Lumbar	1(3)		2	3	3
Sacrum	1		3	2	1
Hand Bones			4	1	3
Carpals			5	2	1
Navicular	–	1	Phalanges		
Lunate	1	–	Proximal		
Triquetral	–	1	1	2(3)	
Pisiform	1(2)		2-5	1(6)	
Greater Multangular	–	1	Middle	–	
Lesser Multangular	1	–	Distal	1(2)	

TABLE A3.—Lower concentration of Feature 6

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	1
Humerus	1	1	Hamate	1	–
Radius	1	1	Metacarpals		
Ulna	1	1	1	1	1
Femur	1	1	2	1	1
Tibia	1	1	3	1	1
Fibula	1	1	4	1	1
Irregular Bones			5	1	1
Clavicle	1	1	Phalanges		
Scapula	1	1	Proximal 1-5	1(9)	
Temporal	1	1	Middle	1(6)	
Maxilla	1	1	Distal 1-5	1(4)	
Mandible	1	1	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium			Calcaneus	1	1
Innominate	1	1	Talus	1	1
Patella	1	1	Cuboid	–	1
Rib	2(25)		Navicular	1	1
Vertebrae			Cuneiforms:		
Cervical			1	1	1
1	1		2	1	1
2	1		3	1	1
3–7	1(5)		Metatarsals		
Thoracic	1(12)		1	1	1
Lumbar	1(5)		2	1	1
Sacrum	1		3	1	1
Hand Bones			4	1	1
Carpals			5	1	1
Navicular	1	1	Phalanges		
Lunate	1	1	Proximal		
Triquetral	1	–	1	1(2)	
Pisiform	–		2-5	1(8)	
Greater Multangular	1	–	Middle	1(7)	
Lesser Multangular	1	1	Distal	1(1)	

TABLE A4.—Entire feature 6

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	1
Humerus	1 2(3)	2	Hamate	1	–
Radius	1	2	Metacarpals		
Ulna	2 1(2)	2	1	1	2
Femur	2 1(1)	2	2	1	1
Tibia	2 1(2)	2	3	1	1
Fibula	1 1(2)	1	4	1	1
Irregular Bones			5	1	1
Clavicle	1	2	Phalanges		
Scapula	1	2	Proximal 1-5	1(10)	
Temporal	4	4	Middle	1(7)	
Maxilla	1	1	Distal 1-5	1(4)	
Mandible	4	4	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	1		Calcaneus	2	1
Innominate	2	2	Talus	2	1
Patella	1	1	Cuboid	–	1
Rib	2(33)		Navicular	2	1
Vertebrae			Cuneiforms:		
Cervical			1	1	1
1	2		2	1	1
2	2		3	1	1
3–7	2(8)		Metatarsals		
Thoracic	2(15)		1	2	2
Lumbar	2(9)		2	1	1
Sacrum	1		3	1	1
Hand Bones			4	1	3
Carpals			5	1	1
Navicular	1	1	Phalanges		
Lunate	1	1	Proximal		
Triquetral	1	–	1	2(3)	
Pisiform	–		2-5	2(9)	
Greater Multangular	1	–	Middle	1(7)	
Lesser Multangular	1	1	Distal	1(1)	

TABLE A5.—Feature 7

Bone	*Left*		*Right*
Long Bones			
Humerus	6		11
Radius	4		7
Ulna	9		4
Femur	11		3
Tibia	3		5
Fibula	2	3(5)	4
Irregular Bones			
Clavicle	6		8
Scapula	6		5
Temporal	9		9
Maxilla	5	1(1)	6
Mandible	9	5	9
Gladiolus		3	
Manubrium		5	
Innominate	6		5
Patella	9		8
Rib		4(87)	
Vertebrae			
Cervical			
1		4	
2		7	
3–7		8(40)	
Thoracic		8(93)	
Lumbar		10(46)	
Sacrum		3	
Hand Bones			
Carpals			
Navicular	3		1
Lunate	–		–
Triquetral	1		1
Pisiform		–	
Greater Multangular	1		1
Lesser Multangular	–		–
Capitate	4		3
Hamate	3		3
Metacarpals			
1	6		6
2	8		6
3	7		6
4	4		5
5	3		3
Phalanges			
Proximal 1-5		5(46)	
Middle		2(10)	
Distal 1-5		1(1)	
Foot Bones			
Tarsals			
Calcaneus	8		8
Talus	9		9
Cuboid	8		7
Navicular	8		9
Cuneiforms:			
1	9		9
2	6		5
3	6		6
Metatarsals			
1	9		7
2	8		10
3	6		9
4	6		6
5	5		6
Phalanges			
Proximal			
1		6(12)	
2-5		4(27)	
Middle		1(4)	
Distal		1(6)	

TABLE A6.—Feature 8

Bone	*Left*		*Right*
Long Bones			
Humerus	4		5
Radius	8		8
Ulna	8		7
Femur	4	1(2)	4
Tibia	4		4
Fibula	5		4
Irregular Bones			
Clavicle	5		3
Scapula	4		4
Temporal	8		8
Maxilla	4		3
Mandible	1		3
Gladiolus		4	
Manubrium		3	
Innominate	5		5
Patella	6		4
Rib		3(58)	
Vertebrae			
Cervical			
1		8	
2		6	
3–7		6(26)	
Thoracic		5(55)	
Lumbar		7(31)	
Sacrum		3	
Hand Bones			
Carpals			
Navicular	2		1
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	1		1
Hamate	–		1
Metacarpals			
1	5		3
2	7		4
3	4		5
4	4		1
5	2		2
Phalanges			
Proximal 1-5		4(32)	
Middle		2(9)	
Distal 1-5		1(2)	
Foot Bones			
Tarsals			
Calcaneus	5		8
Talus	6		8
Cuboid	5		3
Navicular	4		3
Cuneiforms:			
1	5		4
2	–		1
3	3		2
Metatarsals			
1	6		6
2	5		3
3	5		3
4	4		5
5	4		2
Phalanges			
Proximal			
1		4(8)	
2-5		1(2)	
Middle		–	
Distal		1(2)	

TABLE A7.—Feature 11

Bone	*Left*		*Right*
Long Bones			
Humerus	6		8
Radius	3		3
Ulna	4		4
Femur	5		7
Tibia	4		4
Fibula	2	2(4)	3
Irregular Bones			
Clavicle	3		2
Scapula	3		4
Temporal	4		4
Maxilla	3		5
Mandible	5		5
Gladiolus		3	
Manubrium		2	
Innominate	4		4
Patella	1		1
Rib		2(48)	
Vertebrae			
Cervical			
1		2	
2		1	
3–7		1(5)	
Thoracic		2(20)	
Lumbar		4(16)	
Sacrum		4(4)	
Hand Bones			
Carpals			
Navicular	1		–
Lunate	–		1
Triquetral	–		1
Pisiform		–	
Greater Multangular	1		1
Lesser Multangular	–		–
Capitate	2		–
Hamate	1		2
Metacarpals			
1	1		1
2	1		–
3	1		–
4	1		1
5	1		–
Phalanges			
Proximal 1-5		1(9)	
Middle		2(9)	
Distal 1-5		1(3)	
Foot Bones			
Tarsals			
Calcaneus	3		1
Talus	1		2
Cuboid	1		3
Navicular	–		1
Cuneiforms:			
1	1		1
2	1		–
3	–		–
Metatarsals			
1	1		1
2	1		1
3	1		–
4	1		2
5	2		1
Phalanges			
Proximal			
1		2(3)	
2-5		2(14)	
Middle		1(1)	
Distal		1(1)	

TABLE A8.—Feature 13

Bone	*Left*		*Right*
Long Bones			
Humerus	–		–
Radius	–	1(2)	–
Ulna	1		–
Femur	–	1(2)	–
Tibia	–	1(2)	–
Fibula	–		–
Irregular Bones			
Clavicle	1		1
Scapula	1		1
Temporal	–		–
Maxilla	–		–
Mandible	–		–
Gladiolus		–	
Manubrium		–	
Innominate	–		–
Patella	–		–
Rib		1(1)	
Vertebrae			
Cervical			
1		–	
2		–	
3–7		–	
Thoracic		1(1)	
Lumbar		1(2)	
Sacrum		–	
Hand Bones			
Carpals			
Navicular	–		–
Lunate	–		–
Triquetral	–		–
Pisiform		1(1)	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	–		–
Hamate	–		–
Metacarpals			
1	–		–
2	–		1
3	–		–
4	–		–
5	–		–
Phalanges			
Proximal 1-5		1(3)	
Middle		1(1)	
Distal 1-5		–	
Foot Bones			
Tarsals			
Calcaneus	–		–
Talus	–		–
Cuboid	–		–
Navicular	1		–
Cuneiforms:			
1	–		–
2	–		–
3	–		–
Metatarsals			
1	–		–
2	–		–
3	–		–
4	–		–
5	1		1
Phalanges			
Proximal			
1		1(2)	
2-5		–	
Middle		1(1)	
Distal		1(2)	

TABLE A9.—Feature 14

Bone	*Left*		*Right*
Long Bones			
Humerus	1		2
Radius	1	1(1)	1
Ulna	1		2
Femur	3	1(1)	1
Tibia	–	1(1)	2
Fibula	1	1(1)	3
Irregular Bones			
Clavicle	1		3
Scapula	2		3
Temporal	2		2
Maxilla	1		–
Mandible	2	1(1)	3
Gladiolus		–	
Manubrium		–	
Innominate	1		1
Patella	–		–
Rib		1(22)	
Vertebrae			
Cervical			
1		1	
2		–	
3–7		1(4)	
Thoracic		1(10)	
Lumbar		1(2)	
Sacrum		–	
Hand Bones			
Carpals			
Navicular	–		–
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	–		–
Hamate	–		–
Metacarpals			
1	1		–
2	2		1
3	3		1
4	–		–
5	1		–
Phalanges			
Proximal 1-5		1(8)	
Middle		1(2)	
Distal 1-5		–	
Foot Bones			
Tarsals			
Calcaneus	–		–
Talus	–		–
Cuboid	–		–
Navicular	1		–
Cuneiforms:			
1	–		–
2	–		–
3	–		–
Metatarsals			
1	3		2
2	1		2
3	–		2
4	2		3
5	1		1
Phalanges			
Proximal			
1		1(1)	
2-5		–	
Middle		–	
Distal		–	

TABLE A10.—Feature 15

Bone	*Left*		*Right*
Long Bones			
Humerus	4		5
Radius	3		2
Ulna	4		4
Femur	4		4
Tibia	3		3
Fibula	1	2(4)	1
Irregular Bones			
Clavicle	2		3
Scapula	3		3
Temporal	2		4
Maxilla	1		1
Mandible	2		2
Gladiolus		–	
Manubrium		2	
Innominate	3		2
Patella	–		–
Rib		1(8)	
Vertebrae			
Cervical			
1		1	
2		3	
3–7		1(5)	
Thoracic		2(15)	
Lumbar		2(9)	
Sacrum		4	
Hand Bones			
Carpals			
Navicular	1		–
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	–		–
Hamate	–		–
Metacarpals			
1	1		–
2	1		2
3	–		1
4	–		–
5	–		–
Phalanges			
Proximal 1-5		1	
Middle		–	
Distal 1-5		–	
Foot Bones			
Tarsals			
Calcaneus	2		2
Talus	4		3
Cuboid	1		–
Navicular	–		1
Cuneiforms:			
1	1		–
2	–		–
3	–		–
Metatarsals			
1	2		1
2	1		1
3	1		–
4	1		1
5	2		–
Phalanges			
Proximal			
1		–	
2-5		–	
Middle		–	
Distal		–	

TABLE A11.—Feature 16

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	–
Humerus	1	2	Hamate	–	1
Radius	2	1	Metacarpals		
Ulna	1	1	1	1	–
Femur	1	1	2	1	1
Tibia	2	2	3	2	–
Fibula	2	2	4	–	–
Irregular Bones			5	1	–
Clavicle	1	2	Phalanges		
Scapula	1	2	Proximal 1-5	2(9)	
Temporal	3	–	Middle	1(1)	
Maxilla	2	1	Distal 1-5	–	
Mandible	2	2	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	1		Calcaneus	2	2
Innominate	1	1	Talus	2	2
Patella	1	1	Cuboid	1	1
Rib	1(7)		Navicular	1	1
Vertebrae			Cuneiforms:		
Cervical			1	1	1
1	1		2	–	1
2	2		3	–	–
3–7	2(9)		Metatarsals		
Thoracic	1(8)		1	1	2
Lumbar	1(5)		2	1	–
Sacrum	1		3	1	1
Hand Bones			4	1	2
Carpals			5	–	1
Navicular	–	1	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	1(2)	
Pisiform	–		2-5	1(2)	
Greater Multangular	–	–	Middle	–	
Lesser Multangular	–	–	Distal	–	

TABLE A12.—Feature 17

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	4	3
Humerus	3	3	Hamate	4	4
Radius	2	3	Metacarpals		
Ulna	2	4	1	4	4
Femur	6	6	2	4	4
Tibia	4	3	3	4	3
Fibula	2 1(2)	2	4	3	3
Irregular Bones			5	2	3
Clavicle	2	2	Phalanges		
Scapula	4	4	Proximal 1-5	4(31)	
Temporal	6	5	Middle	4(27)	
Maxilla	3	3	Distal 1-5	2(17)	
Mandible	6	6	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	1		Calcaneus	5	5
Innominate	1	3	Talus	7	6
Patella	4	5	Cuboid	3	2
Rib	1(18)		Navicular	3	3
Vertebrae			Cuneiforms:		
Cervical			1	4	5
1	4		2	4	2
2	2		3	4	4
3–7	4(17)		Metatarsals		
Thoracic	2(22)		1	3	4
Lumbar	4(16)		2	2	4
Sacrum	2		3	3	4
Hand Bones			4	5	6
Carpals			5	4	3
Navicular	5	3	Phalanges		
Lunate	4	3	Proximal		
Triquetral	2	3	1	3(5)	
Pisiform	1(2)		2-5	3(24)	
Greater Multangular	3	1	Middle	1(3)	
Lesser Multangular	4	3	Distal	1(7)	

TABLE A13.—Feature 18

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	–
Humerus	2	1	Hamate	1	–
Radius	1	2	Metacarpals		
Ulna	4	4	1	3	3
Femur	2	1	2	–	–
Tibia	2	2	3	–	1
Fibula	2	3	4	2	1
Irregular Bones			5	5	2
Clavicle	2	2	Phalanges		
Scapula	4	1	Proximal 1-5	3(22)	
Temporal	3	5	Middle	2(14)	
Maxilla	2	3	Distal 1-5	1(1)	
Mandible	3	3	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	2	4
Innominate	1	1	Talus	3	5
Patella	2	2	Cuboid	3	2
Rib	2(27)		Navicular	2	2
Vertebrae			Cuneiforms:		
Cervical			1	–	1
1	2		2	2	1
2	1		3	1	5
3–7	2(7)		Metatarsals		
Thoracic	2(13)		1	2	4
Lumbar	2(8)		2	1	3
Sacrum	1		3	2	2
Hand Bones			4	2	3
Carpals			5	2	3
Navicular	3	1	Phalanges		
Lunate	–	–	Proximal		
Triquetral	1	–	1	1(2)	
Pisiform	–		2-5	3(10)	
Greater Multangular	–	–	Middle	–	
Lesser Multangular	2	1	Distal	1(3)	

TABLE A14.—Feature 21

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	3	3
Humerus	8	10	Hamate	3	3
Radius	4	6	Metacarpals		
Ulna	5	6	1	2	3
Femur	8	6	2	4	4
Tibia	4	5	3	2	4
Fibula	4	4	4	2	3
Irregular Bones			5	2	1
Clavicle	5	6	Phalanges		
Scapula	4	7	Proximal 1-5	5(42)	
Temporal	6	8	Middle	3(21)	
Maxilla	7	5	Distal 1-5	1(6)	
Mandible	8	6	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	6	5
Innominate	5	6	Talus	7	7
Patella	5	6	Cuboid	4	3
Rib	2(27)		Navicular	5	7
Vertebrae			Cuneiforms:		
Cervical			1	4	4
1	2		2	3	3
2	5		3	3	3
3–7	6(27)		Metatarsals		
Thoracic	3(27)		1	5	3
Lumbar	5(24)		2	6	4
Sacrum	3		3	3	3
Hand Bones			4	5	5
Carpals			5	5	4
Navicular	4	3	Phalanges		
Lunate	3	2	Proximal		
Triquetral	1	–	1	3(6)	
Pisiform	–		2-5	3(22)	
Greater Multangular	1	1	Middle	1	
Lesser Multangular	2	–	Distal	1(2)	

TABLE A15.—Feature 22

Bone	*Left*		*Right*
Long Bones			
Humerus	8		8
Radius	5		8
Ulna	6		7
Femur	8		8
Tibia	8		8
Fibula	2	4(7)	4
Irregular Bones			
Clavicle	6		5
Scapula	4		4
Temporal	8		8
Maxilla	7		6
Mandible	7		7
Gladiolus		1	
Manubrium		2	
Innominate	3		3
Patella	4		5
Rib		2(37)	
Vertebrae			
Cervical			
1		2	
2		5	
3–7		3(11)	
Thoracic		2(19)	
Lumbar		4(16)	
Sacrum		1	
Hand Bones			
Carpals			
Navicular	3		4
Lunate	3		4
Triquetral	2		1
Pisiform		1(1)	
Greater Multangular	2		4
Lesser Multangular	2		–
Capitate	2		3
Hamate	2		2
Metacarpals			
1	1		2
2	3		5
3	4		3
4	4		2
5	3		1
Phalanges			
Proximal 1-5		3(29)	
Middle		4(25)	
Distal 1-5		2(13)	
Foot Bones			
Tarsals			
Calcaneus	6		4
Talus	6		5
Cuboid	4		3
Navicular	6		6
Cuneiforms:			
1	3		4
2	2		2
3	2		3
Metatarsals			
1	4		5
2	4		3
3	4		1
4	6		7
5	6		3
Phalanges			
Proximal			
1		4(8)	
2-5		3(21)	
Middle		1	
Distal		–	

TABLE A16.—Feature 23

Bone	*Left*		*Right*
Long Bones			
Humerus	3		3
Radius	3		3
Ulna	3		3
Femur	3		3
Tibia	3		3
Fibula	3		3
Irregular Bones			
Clavicle	3		3
Scapula	3		3
Temporal	3		3
Maxilla	3		3
Mandible	3		3
Gladiolus		1	
Manubrium		1	
Innominate	3		3
Patella	3		3
Rib		3(71)	
Vertebrae			
Cervical			
1		3	
2		4	
3–7		4(17)	
Thoracic		2(22)	
Lumbar		2(7)	
Sacrum		2	
Hand Bones			
Carpals			
Navicular	3		2
Lunate	1		–
Triquetral	2		3
Pisiform		1(2)	
Greater Multangular	1		2
Lesser Multangular	–		2
Capitate	3		3
Hamate	2		3
Metacarpals			
1	3		3
2	3		3
3	3		3
4	3		3
5	3		3
Phalanges			
Proximal 1-5		3(29)	
Middle		3(17)	
Distal 1-5		2(13)	
Foot Bones			
Tarsals			
Calcaneus	3		2
Talus	3		3
Cuboid	3		3
Navicular	3		3
Cuneiforms:			
1	3		3
2	3		2
3	3		3
Metatarsals			
1	3		3
2	2		3
3	3		2
4	3		3
5	3		3
Phalanges			
Proximal			
1		3(5)	
2-5		3(17)	
Middle		1(4)	
Distal		1(3)	

TABLE A17.—Feature 24

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	2	2
Humerus	5	6	Hamate	3	1
Radius	5	3	Metacarpals		
Ulna	4	3	1	5	4
Femur	5	5	2	3	4
Tibia	4	5	3	3	3
Fibula	3	3	4	4	4
Irregular Bones			5	3	3
Clavicle	3	5	Phalanges		
Scapula	4	5	Proximal 1-5	4(34)	
Temporal	5	5	Middle	3(17)	
Maxilla	4	4	Distal 1-5	1(5)	
Mandible	6	4	Foot Bones		
Gladiolus	2		Tarsals		
Manubrium	2		Calcaneus	6	6
Innominate	5	5	Talus	5	5
Patella	4	5	Cuboid	4	5
Rib	3(63)		Navicular	4	3
Vertebrae			Cuneiforms:		
Cervical			1	4	4
1	5		2	3	3
2	5		3	3	3
3-7	3(15)		Metatarsals		
Thoracic	3(33)		1	5	5
Lumbar	5(23)		2	5	5
Sacrum	3		3	5	4
Hand Bones			4	5	4
Carpals			5	3	4
Navicular	4	3	Phalanges		
Lunate	1	3	Proximal		
Triquetral	2	1	1	4(8)	
Pisiform	1(1)		2-5	3(23)	
Greater Multangular	1	1	Middle	1(1)	
Lesser Multangular	1	1	Distal	1(4)	

TABLE A18.—Feature 25

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	3	4
Humerus	6	6	Hamate	3	3
Radius	3	3	Metacarpals		
Ulna	5	5	1	3	4
Femur	4	5	2	4	4
Tibia	5	5	3	4	3
Fibula	1	3	4	5	5
Irregular Bones			5	3	5
Clavicle	5	5	Phalanges		
Scapula	3	4	Proximal 1-5	5(41)	
Temporal	5	4	Middle	2(15)	
Maxilla	4	3	Distal 1-5	2(12)	
Mandible	4	5	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	1		Calcaneus	3	4
Innominate	4	4	Talus	4	5
Patella	3	5	Cuboid	5	5
Rib	2(40)		Navicular	3	3
Vertebrae			Cuneiforms:		
Cervical			1	3	1
1	5		2	3	4
2	5		3	3	4
3-7	4(16)		Metatarsals		
Thoracic	3(35)		1	4	4
Lumbar	5(23)		2	3	2
Sacrum	2		3	2	2
Hand Bones			4	5	5
Carpals			5	5	2
Navicular	3	3	Phalanges		
Lunate	2	2	Proximal		
Triquetral	1	1	1	4(7)	
Pisiform	1(2)		2-5	3(17)	
Greater Multangular	–	2	Middle	1(2)	
Lesser Multangular	–	1	Distal	1(3)	

TABLE A19.—Feature 26, between urn and covering

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	1
Humerus	2	–	Hamate	–	–
Radius	2	1	Metacarpals		
Ulna	1	2	1	1	1
Femur	–	–	2	1	1
Tibia	1	1	3	1	1
Fibula	–	2	4	1	1
Irregular Bones			5	2	1
Clavicle	1	2	Phalanges		
Scapula	1	2	Proximal 1-5	1	
Temporal	–	–	Middle	1(2)	
Maxilla	1	–	Distal 1-5	–	
Mandible	1	1	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	1	–
Innominate	–	–	Talus	3	2
Patella	1	–	Cuboid	–	–
Rib	1(10)		Navicular	1	–
Vertebrae			Cuneiforms:		
Cervical			1	–	–
1	3		2	–	–
2	3		3	–	–
3–7	1(5)		Metatarsals		
Thoracic	1(5)		1	1	–
Lumbar	1(2)		2	1	1
Sacrum	1		3	1	1
Hand Bones			4	1	–
Carpals			5	1	2
Navicular	–	–	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	–	
Pisiform	–	–	2-5	1(2)	
Greater Multangular	–	–	Middle	–	
Lesser Multangular	–	–	Distal	1	

TABLE A20.—Entire feature 26

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	2
Humerus	7	8	Hamate	1	–
Radius	4	4	Metacarpals		
Ulna	4	6	1	2	3
Femur	9	9	2	2	2
Tibia	6	5	3	2	1
Fibula	1 1(1)	3	4	2	2
Irregular Bones			5	1	2
Clavicle	4	7	Phalanges		
Scapula	3	3	Proximal 1-5	2(14)	
Temporal	8	8	Middle	2(12)	
Maxilla	4	4	Distal 1-5	1(9)	
Mandible	6	6	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	1		Calcaneus	1	2
Innominate	3	2	Talus	3	3
Patella	1	1	Cuboid	1	1
Rib	2(32)		Navicular	2	3
Vertebrae			Cuneiforms:		
Cervical			1	2	3
1	4		2	1	1
2	4		3	1	1
3–7	3(15)		Metatarsals		
Thoracic	2(14)		1	1	1
Lumbar	2(8)		2	4	2
Sacrum	2		3	1	2
Hand Bones			4	1	1
Carpals			5	3	3
Navicular	1	–	Phalanges		
Lunate	–	1	Proximal		
Triquetral	1	–	1	1(2)	
Pisiform	–		2-5	2(10)	
Greater Multangular	1	1	Middle	1(5)	
Lesser Multangular	1	–	Distal	1(2)	

TABLE A21.—Feature 27

Bone	*Left*		*Right*
Long Bones			
Humerus	2		2
Radius	1	1(1)	1
Ulna	2		2
Femur	1		2
Tibia	1		1
Fibula	1	1(1)	1
Irregular Bones			
Clavicle	1		1
Scapula	2		2
Temporal	2		3
Maxilla	1		2
Mandible	2		2
Gladiolus		1	
Manubrium		1	
Innominate	1		1
Patella	1		2
Rib		2(41)	
Vertebrae			
Cervical			
1		2	
2		1	
3–7		2(8)	
Thoracic		2(15)	
Lumbar		2(6)	
Sacrum		1	
Hand Bones			
Carpals			
Navicular	1		–
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	1		1
Hamate	1		–
Metacarpals			
1	2		1
2	2		2
3	1		2
4	1		1
5	1		1
Phalanges			
Proximal 1-5		2(12)	
Middle		1(3)	
Distal 1-5		–	
Foot Bones			
Tarsals			
Calcaneus	1		1
Talus	2		2
Cuboid	2		–
Navicular	1		1
Cuneiforms:			
1	1		1
2	1		–
3	–		–
Metatarsals			
1	1		2
2	2		3
3	2		2
4	1		2
5	2		2
Phalanges			
Proximal			
1		1(2)	
2-5		1(4)	
Middle		–	
Distal		1(2)	

TABLE A22.—Feature 30, between urn and covering

Bone	*Left*		*Right*
Long Bones			
Humerus	–		–
Radius	–		1
Ulna	–		1
Femur	–		–
Tibia	1		–
Fibula	–		–
Irregular Bones			
Clavicle	1		–
Scapula	1		1
Temporal	–		–
Maxilla	–		–
Mandible	–		–
Gladiolus		1	
Manubrium		–	
Innominate	–		–
Patella	2		2
Rib		1(14)	
Vertebrae			
Cervical			
1		3	
2		–	
3–7		4	
Thoracic		1(8)	
Lumbar		1(3)	
Sacrum		–	
Hand Bones			
Carpals			
Navicular	–		2
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	1		1
Lesser Multangular	1		–
Capitate	2		2
Hamate	–		2
Metacarpals			
1	–		1
2	1		–
3	1		1
4	1		1
5	1		1
Phalanges			
Proximal 1-5		1(9)	
Middle		1(1)	
Distal 1-5		–	
Foot Bones			
Tarsals			
Calcaneus	1		1
Talus	–		2
Cuboid	3		1
Navicular	1		2
Cuneiforms:			
1	–		–
2	2		–
3	1		–
Metatarsals			
1	–		2
2	–		1
3	1		1
4	1		1
5	1		1
Phalanges			
Proximal			
1		1(2)	
2-5		–	
Middle		–	
Distal		–	

TABLE A23.—Entire feature 30

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	5	5
Humerus	5	5	Hamate	2	5
Radius	5	5	Metacarpals		
Ulna	5	5	1	3	5
Femur	5	5	2	4	3
Tibia	5	5	3	4	4
Fibula	5	4	4	5	3
Irregular Bones			5	4	3
Clavicle	4	4	Phalanges		
Scapula	5	5	Proximal 1-5	5(44)	
Temporal	4	5	Middle	3(17)	
Maxilla	5	5	Distal 1-5	2(12)	
Mandible	5	5	Foot Bones		
Gladiolus	3		Tarsals		
Manubrium	3		Calcaneus	4	5
Innominate	5	4	Talus	5	5
Patella	5	6	Cuboid	5	5
Rib	5(98)		Navicular	5	5
Vertebrae			Cuneiforms:		
Cervical			1	4	5
1	6		2	5	2
2	5		3	4	5
3–7	5(23)		Metatarsals		
Thoracic	4(46)		1	5	4
Lumbar	5(24)		2	4	4
Sacrum	5		3	5	3
Hand Bones			4	3	5
Carpals			5	5	5
Navicular	2	5	Phalanges		
Lunate	2	3	Proximal		
Triquetral	–	4	1	4(7)	
Pisiform	1(2)		2-5	2(13)	
Greater Multangular	4	3	Middle	1(1)	
Lesser Multangular	3	3	Distal	1(3)	

TABLE A24.—Feature 34

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	1
Humerus	1	1	Hamate	–	1
Radius	1	1	Metacarpals		
Ulna	–	1	1	1	–
Femur	1	1	2	1	1
Tibia	1	1	3	1	1
Fibula	1	1	4	1	1
Irregular Bones			5	–	1
Clavicle	1	–	Phalanges		
Scapula	–	1	Proximal 1-5	1(5)	
Temporal	–	–	Middle	1(6)	
Maxilla	–	–	Distal 1-5	1(4)	
Mandible	–	–	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	1	–
Innominate	1	1	Talus	1	–
Patella	–	1	Cuboid	–	–
Rib	1(8)		Navicular	1	1
Vertebrae			Cuneiforms:		
Cervical			1	1	–
1	1		2	1	–
2	1		3	–	–
3–7	1(1)		Metatarsals		
Thoracic	1(6)		1	–	1
Lumbar	1(3)		2	1	1
Sacrum	1		3	1	1
Hand Bones			4	1	1
Carpals			5	1	1
Navicular	–	–	Phalanges		
Lunate	1	–	Proximal		
Triquetral	–	–	1	1(1)	
Pisiform	–		2-5	1(6)	
Greater Multangular	–	–	Middle	–	
Lesser Multangular	–	–	Distal	1(2)	

TABLE A25.—Feature 37A

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	1
Humerus	1	1	Hamate	–	–
Radius	1	1	Metacarpals		
Ulna	1	1	1	1	1
Femur	1	1	2	–	–
Tibia	1	1	3	1	1
Fibula	1	1	4	1	–
Irregular Bones			5	–	–
Clavicle	1	–	Phalanges		
Scapula	1	1	Proximal 1-5	1(2)	
Temporal	1	1	Middle	–	
Maxilla	1	1	Distal 1-5	–	
Mandible	1	1	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	–	–
Innominate	1	1	Talus	1	–
Patella	1	–	Cuboid	–	–
Rib	1(14)		Navicular	–	1
Vertebrae			Cuneiforms:		
Cervical			1	–	–
1	1		2	–	–
2	1		3	–	–
3–7	1(2)		Metatarsals		
Thoracic	1(7)		1	–	–
Lumbar	1(5)		2	–	–
Sacrum	–		3	–	1
Hand Bones			4	–	1
Carpals			5	–	1
Navicular	–	–	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	–	
Pisiform	–		2-5	–	
Greater Multangular	1	–	Middle	–	
Lesser Multangular	–	–	Distal	–	

TABLE A26.—Feature 37D–E

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	1
Humerus	1	3	Hamate	–	–
Radius	–	2	Metacarpals		
Ulna	–	2	1	–	–
Femur	–	1	2	–	1
Tibia	1	1	3	–	1
Fibula	1	1	4	–	–
Irregular Bones			5	–	–
Clavicle	3	2	Phalanges		
Scapula	1	2	Proximal 1-5	1(3)	
Temporal	2	2	Middle	1(1)	
Maxilla	2	2	Distal 1-5	–	
Mandible	3	3	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	–	1
Innominate	1	–	Talus	2	1
Patella	–	1	Cuboid	1	1
Rib	2(25)		Navicular	1	1
Vertebrae			Cuneiforms:		
Cervical			1	1	1
1	–		2	1	–
2	1		3	1	–
3-7	1(4)		Metatarsals		
Thoracic	1(8)		1	1	1
Lumbar	1(2)		2	1	1
Sacrum	–		3	–	–
Hand Bones			4	–	1
Carpals			5	1	1
Navicular	1	–	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	1	1	1(1)	
Pisiform	–		2-5	1(4)	
Greater Multangular	–	–	Middle	–	
Lesser Multangular	–	–	Distal	1(2)	

TABLE A27.—Entire feature 37

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	3
Humerus	3	5	Hamate	1	1
Radius	2	4	Metacarpals		
Ulna	2	4	1	1	2
Femur	2	3	2	–	2
Tibia	3	3	3	1	3
Fibula	3	3	4	1	1
Irregular Bones			5	–	–
Clavicle	5	3	Phalanges		
Scapula	3	4	Proximal 1-5	2(13)	
Temporal	4	4	Middle	1(6)	
Maxilla	3	3	Distal 1-5	1(3)	
Mandible	5	5	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	1		Calcaneus	–	2
Innominate	2	2	Talus	4	2
Patella	2	2	Cuboid	2	1
Rib	3(60)		Navicular	1	3
Vertebrae			Cuneiforms:		
Cervical			1	2	1
1	2		2	2	1
2	2		3	2	1
3-7	2(12)		Metatarsals		
Thoracic	3(27)		1	2	2
Lumbar	3(12)		2	2	1
Sacrum	–		3	–	2
Hand Bones			4	1	3
Carpals			5	2	3
Navicular	2	–	Phalanges		
Lunate	1	1	Proximal		
Triquetral	–	1	1	2(3)	
Pisiform	–		2-5	2(11)	
Greater Multangular	2	1	Middle	1(1)	
Lesser Multangular	1	1	Distal	1(8)	

TABLE A28.—Feature 50

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	1
Humerus	3	3	Hamate	1	1
Radius	2	2	Metacarpals		
Ulna	2	1	1	1	1
Femur	3	5	2	1	1
Tibia	6	4	3	1	1
Fibula	1 1(1)	1	4	1	1
Irregular Bones			5	1	1
Clavicle	1	1	Phalanges		
Scapula	1	1	Proximal 1-5	1(9)	
Temporal	1	1	Middle	1(5)	
Maxilla	1	1	Distal 1-5	1(3)	
Mandible	1	1	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	1		Calcaneus	1	1
Innominate	1	1	Talus	1	1
Patella	1	1	Cuboid	1	1
Rib	3(54)		Navicular	1	1
Vertebrae			Cuneiforms;		
Cervical			1	1	1
1	3		2	1	1
2	2		3	1	1
3-7	2(6)		Metatarsals		
Thoracic	2(15)		1	1	1
Lumbar	1(5)		2	1	1
Sacrum	1		3	1	1
Hand Bones			4	1	1
Carpals			5	1	1
Navicular	1	1	Phalanges		
Lunate	1	1	Proximal		
Triquetral	–	–	1	1(2)	
Pisiform	–		2-5	2(9)	
Greater Multangular	1	1	Middle	1(1)	
Lesser Multangular	–	1	Distal	1(2)	

TABLE A29.—Feature 51

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	2	2
Humerus	2	2	Hamate	2	1
Radius	2	2	Metacarpals		
Ulna	2	2	1	2	2
Femur	2	2	2	2	2
Tibia	2	2	3	2	2
Fibula	2	1	4	1	2
Irregular Bones			5	1	1
Clavicle	2	2	Phalanges		
Scapula	2	2	Proximal 1-5	2(20)	
Temporal	2	2	Middle	2(16)	
Maxilla	2	2	Distal 1-5	1(7)	
Mandible	2	2	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	–		Calcaneus	2	2
Innominate	2	2	Talus	2	2
Patella	2	1	Cuboid	2	2
Rib	2(48)		Navicular	2	2
Vertebrae			Cuneiforms:		
Cervical			1	2	2
1	2		2	2	2
2	2		3	2	2
3-7	2(10)		Metatarsals		
Thoracic	2(18)		1	2	2
Lumbar	2(10)		2	2	2
Sacrum	1		3	2	2
Hand Bones			4	2	2
Carpals			5	2	2
Navicular	2	2	Phalanges		
Lunate	1	1	Proximal		
Triquetral	–	2	1	3(6)	
Pisiform	–		2-5	2(16)	
Greater Multangular	2	2	Middle	1(3)	
Lesser Multangular	1	–	Distal	1(2)	

TABLE A30.—Feature 52

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	1
Humerus	1	2	Hamate	–	1
Radius	2	1	Metacarpals		
Ulna	2	1	1	1	1
Femur	3	3	2	2	1
Tibia	3	3	3	1	1
Fibula	1	1	4	–	–
Irregular Bones			5	1	2
Clavicle	3	3	Phalanges		
Scapula	2	2	Proximal 1-5	1(7)	
Temporal	3	3	Middle	1(2)	
Maxilla	2	2	Distal 1-5	1(3)	
Mandible	1	2	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	1		Calcaneus	3	3
Innominate	2	2	Talus	3	2
Patella	1	1	Cuboid	2	1
Rib	2(36)		Navicular	2	2
Vertebrae			Cuneiforms:		
Cervical			1	1	1
1	–		2	1	1
2	1		3	1	1
3-7	1(3)		Metatarsals		
Thoracic	1(9)		1	1	–
Lumbar	2(7)		2	–	3
Sacrum	1		3	–	2
Hand Bones			4	1	2
Carpals			5	2	1
Navicular	2	2	Phalanges		
Lunate	–	2	Proximal		
Triquetral	–	–	1	2(3)	
Pisiform	1(1)		2-5	1(6)	
Greater Multangular	–	1	Middle	1(2)	
Lesser Multangular	–	1	Distal	1(1)	

TABLE A31.—Feature 53

Bone	*Left*		*Right*
Long Bones			
Humerus	3		6
Radius	3		6
Ulna	6		6
Femur	3		4
Tibia	2		4
Fibula	1	1(2)	3
Irregular Bones			
Clavicle	5		5
Scapula	4		6
Temporal	2		3
Maxilla	3		4
Mandible	7		7
Gladiolus		1	
Manubrium		1	
Innominate	5		5
Patella	4		4
Rib		2(44)	
Vertebrae			
Cervical			
1		4	
2		4	
3-7		3(13)	
Thoracic		2(24)	
Lumbar		5(22)	
Sacrum		3	
Hand Bones			
Carpals			
Navicular	–		–
Lunate	–		–
Triquetral	1		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	1		–
Capitate	1		1
Hamate	–		1
Metacarpals			
1	2		2
2	2		2
3	4		3
4	1		2
5	3		3
Phalanges			
Proximal 1-5		2(17)	
Middle		1(2)	
Distal 1-5		1(2)	
Foot Bones			
Tarsals			
Calcaneus	5		5
Talus	5		4
Cuboid	–		2
Navicular	2		1
Cuneiforms:			
1	2		1
2	–		1
3	1		1
Metatarsals			
1	2		3
2	3		3
3	2		3
4	3		3
5	4		3
Phalanges			
Proximal			
1		2(4)	
2-5		2(10)	
Middle		–	
Distal		1(1)	

TABLE A32.—Feature 56, within the covering

Bone	*Left*		*Right*
Long Bones			
Humerus	–		–
Radius	–		–
Ulna	1		1
Femur	–		–
Tibia	1		–
Fibula	–		–
Irregular Bones			
Clavicle	–		1
Scapula	1		–
Temporal	–		1
Maxilla	–		1
Mandible	1		–
Gladiolus		1	
Manubrium		–	
Innominate	1		–
Patella	–		–
Rib		1(3)	
Vertebrae			
Cervical			
1		1	
2		–	
3-7		1(2)	
Thoracic		1(3)	
Lumbar		1(3)	
Sacrum		–	
Hand Bones			
Carpals			
Navicular	–		–
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	–		–
Hamate	–		1
Metacarpals			
1	–		1
2	1		–
3	–		–
4	–		–
5	–		–
Phalanges			
Proximal 1-5		1(1)	
Middle		–	
Distal 1-5		–	
Foot Bones			
Tarsals			
Calcaneus	–		–
Talus	–		2
Cuboid	–		–
Navicular	1		–
Cuneiforms:			
1	1		2
2	–		1
3	–		–
Metatarsals			
1	–		–
2	–		–
3	–		–
4	–		–
5	1		–
Phalanges			
Proximal			
1		–	
2-5		–	
Middle		–	
Distal		–	

TABLE A33.—Entire feature 56

Bone	*Left*		*Right*
Long Bones			
Humerus	9		8
Radius	4		8
Ulna	7		5
Femur	7		7
Tibia	7		6
Fibula	3	3(5)	3
Irregular Bones			
Clavicle	5		5
Scapula	5		6
Temporal	10		8
Maxilla	10		10
Mandible	8		8
Gladiolus		4	
Manubrium		1	
Innominate	4		7
Patella	6		7
Rib		3(63)	
Vertebrae			
Cervical			
1		7	
2		6	
3-7		8(39)	
Thoracic		5(50)	
Lumbar		3(13)	
Sacrum		3	
Hand Bones			
Carpals			
Navicular	4		4
Lunate	2		2
Triquetral	1		1
Pisiform		1(2)	
Greater Multangular	2		2
Lesser Multangular	2		3
Capitate	3		3
Hamate	3		4
Metacarpals			
1	3		6
2	6		6
3	7		7
4	4		4
5	3		3
Phalanges			
Proximal 1-5		4(36)	
Middle		3(22)	
Distal 1-5		1(9)	
Foot Bones			
Tarsals			
Calcaneus	5		5
Talus	5		8
Cuboid	2		6
Navicular	5		5
Cuneiforms:			
1	5		5
2	3		4
3	2		5
Metatarsals			
1	4		7
2	7		4
3	5		5
4	5		6
5	4		5
Phalanges			
Proximal			
1		4(9)	
2-5		3(22)	
Middle		–	
Distal		1(6)	

Table A34.—Feature 58, near surface

Bone	*Left*		*Right*
Long Bones			
Humerus	2		1
Radius	1		1
Ulna	–		1
Femur	1		1
Tibia	–		–
Fibula	1		–
Irregular Bones			
Clavicle	–		–
Scapula	1		–
Temporal	–		–
Maxilla	–		–
Mandible	1		–
Gladiolus		–	
Manubrium		–	
Innominate	1		1
Patella	–		–
Rib		1(1)	
Vertebrae			
Cervical			
1		1	
2		1	
3-7		–	
Thoracic		1(1)	
Lumbar		1(2)	
Sacrum		1	
Hand Bones			
Carpals			
Navicular	–		–
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	–		–
Hamate	–		–
Metacarpals			
1	–		–
2	–		–
3	–		–
4	–		–
5	–		–
Phalanges			
Proximal 1-5		1(1)	
Middle		–	
Distal 1-5		–	
Foot Bones			
Tarsals			
Calcaneus	–		–
Talus	–		–
Cuboid	–		–
Navicular	–		–
Cuneiforms:			
1	–		–
2	–		–
3	–		1
Metatarsals			
1	–		–
2	–		1
3	–		–
4	–		–
5	–		1
Phalanges			
Proximal			
1		–	
2-5		1(1)	
Middle		–	
Distal		–	

TABLE A35.—Feature 58, within upper urn

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	–
Humerus	2	2	Hamate	–	–
Radius	3	3	Metacarpals		
Ulna	2	4	1	–	–
Femur	3	3	2	1	–
Tibia	3	3	3	–	–
Fibula	1 2(3)	2	4	1	–
Irregular Bones			5	–	–
Clavicle	1	4	Phalanges		
Scapula	1	2	Proximal 1-5	1(1)	
Temporal	3	2	Middle	–	
Maxilla	2	2	Distal 1-5	–	
Mandible	1	4	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	–		Calcaneus	–	–
Innominate	2	1	Talus	2	–
Patella	–	1	Cuboid	1	2
Rib	1(12)		Navicular	2	2
Vertebrae			Cuneiforms:		
Cervical			1	–	–
1	–		2	–	–
2	2		3	–	–
3-7	1(4)		Metatarsals		
Thoracic	2(15)		1	–	1
Lumbar	1(4)		2	1	2
Sacrum	1		3	–	–
Hand Bones			4	1	–
Carpals			5	1	1
Navicular	1	–	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	1(1)	
Pisiform	–		2-5	1(1)	
Greater Multangular	–	–	Middle	–	
Lesser Multangular	1	–	Distal	–	

Table A36.—Feature 58, within lower urn

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	2	1
Humerus	1	1	Hamate	1	1
Radius	–	1	Metacarpals		
Ulna	1	–	1	2	3
Femur	1	2	2	1	2
Tibia	2	2	3	1	1
Fibula	– 1(1)	–	4	1	–
Irregular Bones			5	–	1
Clavicle	2	1	Phalanges		
Scapula	3	2	Proximal 1-5	1(10)	
Temporal	2	2	Middle	1(4)	
Maxilla	–	–	Distal 1-5	1(2)	
Mandible	–	–	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	1		Calcaneus	1	–
Innominate	2		Talus	1	1
Patella	–	–	Cuboid	–	2
Rib	3(59)	1	Navicular	2	3
Vertebrae			Cuneiforms:		
Cervical			1	2	2
1	2		2	2	1
2	2		3	3	1
3-7	2(8)		Metatarsals		
Thoracic	2(15)		1	1	1
Lumbar	2(6)		2	–	1
Sacrum	2		3	–	1
Hand Bones			4	–	–
Carpals			5	1	–
Navicular	–	–	Phalanges		
Lunate	1	–	Proximal		
Triquetral	–	–	1	1(2)	
Pisiform	–		2-5	1(5)	
Greater Multangular	1	–	Middle	1(1)	
Lesser Multangular	1	–	Distal	1(1)	

TABLE A37.—Entire feature 58

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	2	–
Humerus	5	4	Hamate	1	1
Radius	4	5	Metacarpals		
Ulna	3	5	1	2	3
Femur	5	5	2	2	2
Tibia	5	5	3	1	1
Fibula	2 2(4)	2	4	2	–
Irregular Bones			5	–	1
Clavicle	3	5	Phalanges		
Scapula	5	4	Proximal 1-5	2(12)	
Temporal	5	4	Middle	1(4)	
Maxilla	2	2	Distal 1-5	1(2)	
Mandible	2	4	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	1		Calcaneus	1	–
Innominate	5	2	Talus	3	1
Patella	–	2	Cuboid	1	4
Rib	3(72)		Navicular	4	5
Vertebrae			Cuneiforms:		
Cervical			1	2	2
1	3		2	2	1
2	5		3	3	2
3-7	3(12)		Metatarsals		
Thoracic	3(31)		1	1	2
Lumbar	3(12)		2	1	4
Sacrum	4		3	–	1
Hand Bones			4	1	–
Carpals			5	2	2
Navicular	1	–	Phalanges		
Lunate	1	–	Proximal		
Triquetral	–	–	1	2(3)	
Pisiform	–		2-5	1(7)	
Greater Multangular	1	–	Middle	1(1)	
Lesser Multangular	2	–	Distal	1(1)	

TABLE A38.—Feature 59

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	1
Humerus	1	1	Hamate	1	1
Radius	1	1	Metacarpals		
Ulna	1	1	1	1	1
Femur	1	1	2	1	1
Tibia	1	1	3	1	1
Fibula	1	1	4	1	1
Irregular Bones			5	1	1
Clavicle	1	1	Phalanges		
Scapula	1	1	Proximal 1-5	1(8)	
Temporal	1	1	Middle	1(4)	
Maxilla	1	1	Distal 1-5	1(3)	
Mandible	1	1	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	1		Calcaneus	1	1
Innominate	1	1	Talus	1	1
Patella	1	1	Cuboid	1	1
Rib	1(24)		Navicular	1	1
Vertebrae			Cuneiforms:		
Cervical			1	1	1
1	1		2	1	1
2	1		3	1	1
3-7	1(5)		Metatarsals		
Thoracic	1(12)		1	1	1
Lumbar	(6)		2	1	1
Sacrum	(1)		3	1	1
Hand Bones			4	1	1
Carpals			5	1	1
Navicular	1	1	Phalanges		
Lunate	1	–	Proximal		
Triquetral	–	1	1	1(2)	
Pisiform	–	–	2-5	1(4)	
Greater Multangular	1	–	Middle	1(1)	
Lesser Multangular	–	–	Distal	1(1)	

TABLE A39.—Feature 60, upper layer

Bone	*Left*		*Right*
Long Bones			
Humerus	4		2
Radius	3		3
Ulna	6		4
Femur	7		8
Tibia	6		6
Fibula	1	1(2)	1
Irregular Bones			
Clavicle	1		5
Scapula	2		2
Temporal	6		6
Maxilla	3		4
Mandible	5		6
Gladiolus		1	
Manubrium		–	
Innominate	6		5
Patella	–		2
Rib		2(26)	
Vertebrae			
Cervical			
1		–	
2		5	
3-7		3(12)	
Thoracic		3(32)	
Lumbar		3(12)	
Sacrum		–	
Hand Bones			
Carpals			
Navicular	–		–
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	–		–
Hamate	–		–
Metacarpals			
1	1		–
2	2		1
3	1		4
4	–		–
5	–		–
Phalanges			
Proximal 1-5		1(7)	
Middle		–	
Distal 1-5		–	
Foot Bones			
Tarsals			
Calcaneus	2		6
Talus	3		2
Cuboid	–		1
Navicular	2		2
Cuneiforms:			
1	–		3
2	1		–
3	–		–
Metatarsals			
1	4		2
2	2		1
3	2		–
4	1		2
5	1		1
Phalanges			
Proximal			
1		1(1)	
2-5		1(1)	
Middle		–	
Distal		–	

TABLE A40.—Feature 60, middle layer

Bone	*Left*		*Right*
Long Bones			
Humerus	5		5
Radius	5		5
Ulna	4		3
Femur	–		2
Tibia	3		2
Fibula	2	1(2)	1
Irregular Bones			
Clavicle	6		3
Scapula	3		2
Temporal	3		4
Maxilla	2		3
Mandible	2		–
Gladiolus		1	
Manubrium		1	
Innominate	3		2
Patella	2		1
Rib		2(38)	
Vertebrae			
Cervical			
1		3	
2		3	
3-7		4(17)	
Thoracic		2(18)	
Lumbar		3(14)	
Sacrum		2	
Hand Bones			
Carpals			
Navicular	–		–
Lunate	–		–
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	1		–
Hamate	–		–
Metacarpals			
1	–		2
2	1		1
3	1		1
4	–		2
5	–		3
Phalanges			
Proximal 1-5		1(6)	
Middle		–	
Distal 1-5		1(1)	
Foot Bones			
Tarsals			
Calcaneus	4		2
Talus	2		5
Cuboid	3		2
Navicular	1		–
Cuneiforms:			
1	–		1
2	1		1
3	1		1
Metatarsals			
1	3		1
2	–		2
3	1		2
4	2		1
5	2		1
Phalanges			
Proximal			
1		–	
2-5		1(1)	
Middle		–	
Distal		–	

TABLE A41.—Feature 60, lower layer

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	1
Humerus	1	2	Hamate	1	–
Radius	2	2	Metacarpals		
Ulna	2	1	1	1	–
Femur	2	2	2	2	2
Tibia	2	2	3	2	–
Fibula	1 1(1)	1	4	1	1
Irregular Bones			5	1	2
Clavicle	1	1	Phalanges		
Scapula	2	1	Proximal 1-5	1(10)	
Temporal	1	2	Middle	1(3)	
Maxilla	1	1	Distal 1-5	1(1)	
Mandible	2	2	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	2	1
Innominate	–	1	Talus	2	2
Patella	2	1	Cuboid	1	1
Rib	1(13)		Navicular	2	–
Vertebrae			Cuneiforms:		
Cervical			1	1	1
1	2		2	1	1
2	1		3	–	–
3-7	1(5)		Metatarsals		
Thoracic	1(12)		1	1	1
Lumbar	1(3)		2	2	–
Sacrum	1		3	–	2
Hand Bones			4	–	1
Carpals			5	1	1
Navicular	–	1	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	1(2)	
Pisiform	–		2-5	–	
Greater Multangular	1	1	Middle	1(8)	
Lesser Multangular	–	–	Distal	–	

TABLE A42.—Entire feature 60

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	2	1
Humerus	10	9	Hamate	1	–
Radius	10	10	Metacarpals		
Ulna	12	8	1	2	2
Femur	9	12	2	5	4
Tibia	11	10	3	4	5
Fibula	4 2(3)	3	4	1	3
Irregular Bones			5	1	5
Clavicle	8	9	Phalanges		
Scapula	7	5	Proximal 1-5	3(23)	
Temporal	10	12	Middle	1(3)	
Maxilla	6	8	Distal 1-5	1(2)	
Mandible	9	8	Foot Bones		
Gladiolus	2		Tarsals		
Manubrium	1		Calcaneus	8	9
Innominate	9	8	Talus	7	9
Patella	4	4	Cuboid	4	4
Rib	3(67)		Navicular	5	2
Vertebrae			Cuneiforms:		
Cervical			1	1	5
1	5		2	3	2
2	9		3	1	1
3-7	7(34)		Metatarsals		
Thoracic	6(62)		1	8	4
Lumbar	6(29)		2	4	3
Sacrum	2		3	3	4
Hand Bones			4	3	4
Carpals			5	4	3
Navicular	–	1	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	2(3)	
Pisiform	–		2-5	1(2)	
Greater Multangular	1	1	Middle	1(8)	
Lesser Multangular	–	–	Distal	–	

TABLE A43.—Entire feature 61

Bone	Left		Right
Long Bones			
Humerus	9		8
Radius	6		6
Ulna	10		7
Femur	8		9
Tibia	8	1(2)	8
Fibula	10	3(6)	11
Irregular Bones			
Clavicle	7		7
Scapula	6		7
Temporal	9		8
Maxilla	6		7
Mandible	8	1	4
Gladiolus		2	
Manubrium		4	
Innominate	3		4
Patella	5		5
Rib		6(124)	
Vertebrae			
Cervical			
1		8	
2		13	
3-7		8(38)	
Thoracic		7(76)	
Lumbar		5(23)	
Sacrum		3	
Hand Bones			
Carpals			
Navicular	4		5
Lunate	6		6
Triquetral	5		1
Pisiform		2(3)	
Greater Multangular	4		7
Lesser Multangular	3		1
Capitate	2		6
Hamate	7		8
Metacarpals			
1	7		7
2	8		8
3	7		7
4	10		6
5	2		4
Phalanges			
Proximal 1-5		8(75)	
Middle		7(51)	
Distal 1-5		2(16)	
Foot Bones			
Tarsals			
Calcaneus	8		6
Talus	8		8
Cuboid	4		6
Navicular	8		5
Cuneiforms:			
1	6		4
2	5		6
3	9		4
Metatarsals			
1	10		5
2	5		6
3	9		6
4	10		7
5	7		12
Phalanges			
Proximal			
1		8(16)	
2-5		5(40)	
Middle		1(2)	
Distal		1(7)	

TABLE A44.—Feature 61, within covering

Bone	Left		Right
Long Bones			
Humerus	1		2
Radius	1		–
Ulna	1		–
Femur	1		–
Tibia	1		1
Fibula	–		–
Irregular Bones			
Clavicle	–		2
Scapula	1		1
Temporal	–		–
Maxilla	–		1
Mandible	2		–
Gladiolus		–	
Manubrium		–	
Innominate	1		1
Patella	–		–
Rib		1(3)	
Vertebrae			
Cervical			
1		–	
2		1	
3-7		1(2)	
Thoracic		1(2)	
Lumbar		1(1)	
Sacrum		–	
Hand Bones			
Carpals			
Navicular	–		–
Lunate	–		1
Triquetral	–		–
Pisiform		–	
Greater Multangular	–		–
Lesser Multangular	–		–
Capitate	–		1
Hamate	–		–
Metacarpals			
1	1		1
2	–		–
3	–		–
4	1		–
5	–		1
Phalanges			
Proximal 1-5		1(4)	
Middle		1(3)	
Distal 1-5		1(1)	
Foot Bones			
Tarsals			
Calcaneus	–		–
Talus	–		1
Cuboid	–		–
Navicular	1		–
Cuneiforms:			
1	–		–
2	–		–
3	–		1
Metatarsals			
1	1		–
2	1		–
3	–		–
4	–		–
5	–		1
Phalanges			
Proximal			
1		1(1)	
2-5		1(1)	
Middle		1(1)	
Distal		–	

TABLE A45.—Feature 62

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	–
Humerus	3	4	Hamate	–	–
Radius	2	1	Metacarpals		
Ulna	2	1	1	–	–
Femur	5	6	2	–	–
Tibia	3	4	3	–	–
Fibula	–	1	4	–	–
Irregular Bones			5	–	–
Clavicle	–	–	Phalanges		
Scapula	1	1	Proximal 1-5	–	
Temporal	1	2	Middle	–	
Maxilla	2	1	Distal 1-5	–	
Mandible	1	–	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	–	–
Innominate	3	1	Talus	–	–
Patella	–	–	Cuboid	–	–
Rib	–		Navicular	–	–
Vertebrae			Cuneiforms:		
Cervical			1	–	–
1	–		2	–	–
2	–		3	–	–
3-7	1(1)		Metatarsals		
Thoracic	–		1	–	–
Lumbar	–		2	–	–
Sacrum	–		3	–	–
Hand Bones			4	–	–
Carpals			5	–	–
Navicular	–	–	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	–	
Pisiform	–		2-5	–	
Greater Multangular	–	–	Middle	–	
Lesser Multangular	–	–	Distal	–	

TABLE A46.—Feature 69

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	1	2
Humerus	2	1	Hamate	–	1
Radius	2	2	Metacarpals		
Ulna	2	2	1	1	1
Femur	2	2	2	1	2
Tibia	2	2	3	1	1
Fibula	2	2	4	1	1
Irregular Bones			5	1	1
Clavicle	2	2	Phalanges		
Scapula	2	2	Proximal 1-5	2(16)	
Temporal	2	2	Middle	1(5)	
Maxilla	–	1	Distal 1-5	1(2)	
Mandible	2	2	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	2		Calcaneus	1	1
Innominate	2	2	Talus	1	1
Patella	2	–	Cuboid	1	1
Rib	2(32)		Navicular	1	1
Vertebrae			Cuneiforms:		
Cervical			1	1	1
1	1		2	1	1
2	1		3	1	1
3-7	2(7)		Metatarsals		
Thoracic	2(14)		1	2	2
Lumbar	2(7)		2	–	2
Sacrum	1		3	–	–
Hand Bones			4	–	1
Carpals			5	2	2
Navicular	1	1	Phalanges		
Lunate	–	1	Proximal		
Triquetral	1	2	1	1(2)	
Pisiform	–		2-5	1(5)	
Greater Multangular	1	1	Middle	–	
Lesser Multangular	–	–	Distal	1(1)	

TABLE A47.—Feature 75

Bone	Left	Right	Bone	Left	Right
Long Bones			Capitate	1	1
Humerus	1	1	Hamate	–	1
Radius	1	1	Metacarpals		
Ulna	1	1	1	–	1
Femur	1	1	2	1	–
Tibia	1	1	3	1	1
Fibula	1	1	4	1	1
Irregular Bones			5	1	1
Clavicle	1	1	Phalanges		
Scapula	1	1	Proximal 1-5	1(4)	
Temporal	1	1	Middle	1(3)	
Maxilla	1	–	Distal 1-5	1(1)	
Mandible	1	1	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	1	1
Innominate	–	1	Talus	1	1
Patella	1	1	Cuboid	1	1
Rib	1(13)		Navicular	1	1
Vertebrae			Cuneiforms:		
Cervical			1	–	1
1	1		2	1	1
2	1		3	1	–
3-7	1(2)		Metatarsals		
Thoracic	1(1)		1	1	1
Lumbar	1(1)		2	–	–
Sacrum	–		3	1	1
Hand Bones			4	1	–
Carpals			5	1	1
Navicular	–	–	Phalanges		
Lunate	1	–	Proximal		
Triquetral	–	–	1	1(2)	
Pisiform	–		2-5	1(6)	
Greater Multangular	–	–	Middle	1(1)	
Lesser Multangular	–	–	Distal	–	

TABLE A48.—Feature 76

Bone	Left	Right	Bone	Left	Right
Long Bones			Capitate	–	–
Humerus	1	1	Hamate	1	–
Radius	2	–	Metacarpals		
Ulna	–	1	1	–	–
Femur	1	2	2	–	–
Tibia	2	2	3	–	–
Fibula	1	–	4	1	–
Irregular Bones			5	1	–
Clavicle	–	1	Phalanges		
Scapula	–	1	Proximal 1-5	1(6)	
Temporal	–	1	Middle	1	
Maxilla	–	1	Distal 1-5	–	
Mandible	1	1	Foot Bones		
Gladiolus	–		Tarsals		
Manubrium	–		Calcaneus	1	1
Innominate	–	–	Talus	–	2
Patella	–	–	Cuboid	–	–
Rib	1(15)		Navicular	1	1
Vertebrae			Cuneiforms:		
Cervical			1	–	–
1	–		2	–	–
2	–		3	–	–
3-7	1(2)		Metatarsals		
Thoracic	2(16)		1	–	–
Lumbar	1(2)		2	–	1
Sacrum	–		3	–	–
Hand Bones			4	–	1
Carpals			5	–	–
Navicular	–	–	Phalanges		
Lunate	–	–	Proximal		
Triquetral	–	–	1	–	
Pisiform	–		2-5	1(3)	
Greater Multangular	1	–	Middle	–	
Lesser Multangular	–	–	Distal	–	

TABLE A49.—Feature 77

Bone	*Left*	*Right*	*Bone*	*Left*	*Right*
Long Bones			Capitate	–	–
Humerus	–	–	Hamate	–	–
Radius	–	–	Metacarpals		
Ulna	–	–	1	2	2
Femur	1	2	2	1	–
Tibia	1	1	3	–	1
Fibula	–	–	4	–	–
Irregular Bones			5	1	1
Clavicle	–	1	Phalanges		
Scapula	–	–	Proximal 1-5	1(7)	
Temporal	–	–	Middle	1(2)	
Maxilla	–	–	Distal 1-5	1(2)	
Mandible	–	–	Foot Bones		
Gladiolus	1		Tarsals		
Manubrium	1		Calcaneus	–	–
Innominate	–	1	Talus	1	1
Patella	–	–	Cuboid	1	1
Rib	1(14)		Navicular	–	–
Vertebrae			Cuneiforms:		
Cervical			1	1	–
1	–		2	1	–
2	–		3	–	2
3-7	1(5)		Metatarsals		
Thoracic	1(4)		1	3	1
Lumbar	1(1)		2	–	3
Sacrum	–		3	1	1
Hand Bones			4	1	1
Carpals			5	1	–
Navicular	1	1	Phalanges		
Lunate	–	–	Proximal		
Triquetral	1	–	1	1(1)	
Pisiform	–		2-5	1(5)	
Greater Multangular	–	–	Middle	–	
Lesser Multangular	–	–	Distal	1(2)	

TABLE A50.—All urn features

Bone	*Left*		*Right*	*Bone*	*Left*	*Right*
Long Bones				Capitate	51	54
Humerus	133		147	Hamate	43	52
Radius	102		116	Metacarpals		
Ulna	128	1	117	1	73	84
Femur	142	3	145	2	87	83
Tibia	123	3	124	3	85	82
Fibula	71	25	81	4	69	59
Irregular Bones				5	53	59
Clavicle	102		110	Phalanges		
Scapula	103		111	Proximal 1-5	70	
Temporal	141		146	Middle	44	
Maxilla	99	5	100	Distal 1-5	17	
Mandible	131	9	128	Foot Bones		
Gladiolus		37		Tarsals		
Manubrium		43		Calcaneus	104	100
Innominate	96		97	Talus	117	121
Patella	84	58	92	Cuboid	74	77
Rib				Navicular	93	86
Vertebrae				Cuneiforms:		
Cervical				1	73	79
1		96		2	61	50
2		110		3	61	62
3-7		93		Metatarsals		
Thoracic		72		1	103	93
Lumbar		88		2	82	90
Sacrum		58		3	80	75
Hand Bones				4	88	101
Carpals				5	89	87
Navicular	56		49	Phalanges		
Lunate	34		34	Proximal		
Triquetral	24		23	1	70	
Pisiform		10		2-5	49	
Greater Multangular	31		34	Middle	7	
Lesser Multangular	27		19	Distal	7	

TABLE A51.—Feature 2

Bone	*Left*	*Right*
Humerus	3	4
Radius	1	
Ulna	3	3
Femur	4	5
Tibia	1	4
Fibula		
Clavicle	–	
Scapula	2	1
Temporal	–	–
Maxilla	3	1
Mandible	3	2
Rib	1(10)	
Vertebra	1(8)	
Sternum	–	
Ilium	3	3
Ischium	1	1
Pubis	1	–
Patella		–
Calcaneus	–	
Talus	–	
Carpals and tarsals	–	

TABLE A52.—Feature 4

Bone	*Left*	*Right*
Humerus	2	1
Radius	1	–
Ulna	–	
Femur	– 1(1)	1
Tibia	–	
Fibula	–	–
Clavicle	1	1
Scapula	–	–
Temporal	1	1
Maxilla	–	–
Mandible	–	–
Rib	1(1)	
Vertebra	1(15)	
Sternum	–	
Ilium	1	–
Ischium	–	1
Pubis	–	1
Patella		–
Calcaneus	1	–
Talus	–	–
Carpals and tarsals	–	

TABLE A53.—Feature 5

Bone	*Left*	*Right*
Humerus	2	2
Radius	2	2
Ulna	2	2
Femur	2	2
Tibia	2	2
Fibula	2	2
Clavicle	1	1
Scapula	2	1
Temporal	2	2
Maxilla	2	2
Mandible	2	2
Rib	1(6)	
Vertebra	2(36)	
Sternum		
Ilium	2	2
Ischium	1	1
Pubis	–	–
Patella	–	
Calcaneus	–	
Talus	–	–
Carpals and tarsals	1(10)	

TABLE A54.—Feature 6

Bone	*Left*	*Right*
Humerus	–	1
Radius	1	
Ulna	1	
Femur	1	
Tibia	–	–
Fibula	–	–
Clavicle	–	–
Scapula		–
Temporal	4	–
Maxilla		–
Mandible		
Rib	–	
Vertebra	1(1)	
Sternum	–	
Ilium	–	–
Ischium	–	–
Pubis	–	–
Patella	–	–
Calcaneus		–
Talus		
Carpals and tarsals	–	

TABLE A55.—Feature 7

Bone	*Left*	*Right*
Humerus	4	3
Radius	3	1
Ulna	1	1
Femur	4	5
Tibia	3	3
Fibula	1(1)	–
Clavicle	2	–
Scapula	2	2
Temporal	3	3
Maxilla	2	3
Mandible	4	3
Rib		
Vertebra	2(41)	
Sternum	3	
Ilium	2	2
Ischium	1	2
Pubis	1	4
Patella	–	
Calcaneus	2	1
Talus	–	
Carpals and tarsals	1(21)	

TABLE A56.—Feature 8

Bone	*Left*	*Right*
Humerus	4	4
Radius	1	2
Ulna	1	4
Femur	3	5
Tibia	2	1
Fibula	– 1(2)	
Clavicle	2	1
Scapula	1	4
Temporal	4	6
Maxilla	1	2
Mandible	5	3
Rib	–	
Vertebra	2(28)	
Sternum	1	
Ilium	2	4
Ischium	1	1
Pubis		2
Patella		–
Calcaneus	1	1
Talus	–	
Carpals and tarsals	–	

TABLE A57.—Feature 10

Bone	*Left*	*Right*
Humerus	2	2
Radius	2	1
Ulna	2	2
Femur	2	2
Tibia	2	2
Fibula	2	2
Clavicle	1 1(1)	1
Scapula	2	2
Temporal	2	2
Maxilla	2	1
Mandible	2	1
Rib	1(11)	
Vertebra	2(28)	
Sternum	–	
Ilium	2	2
Ischium	–	–
Pubis	1	2
Patella	–	–
Calcaneus	1	1
Talus	1	1
Carpals and tarsals	1(6)	

TABLE A58.—Feature 11

Bone	*Left*	*Right*
Humerus	1	
Radius	–	
Ulna	–	–
Femur	–	
Tibia	1	
Fibula	–	
Clavicle	–	1
Scapula	–	
Temporal	–	
Maxilla	–	
Mandible	–	
Rib		
Vertebra	1(1)	
Sternum	–	
Ilium	–	
Ischium	–	
Pubis	–	
Patella	–	
Calcaneus	–	
Talus	–	–
Carpals and tarsals		

TABLE A59.—Feature 14

Bone	*Left*	*Right*
Humerus	1	2
Radius		1
Ulna	2	
Femur	3 1(1)	2
Tibia	2 1(1)	1
Fibula	– 1(1)	
Clavicle	2	2
Scapula	1	1
Temporal	1	3
Maxilla	1	–
Mandible	1	1
Rib	1(1)	
Vertebra	1(16)	
Sternum	1(3)	
Ilium	1	2
Ischium	–	–
Pubis	–	–
Patella		–
Calcaneus		–
Talus		–
Carpals and tarsals	1(6)	

TABLE A60.—Feature 15

Bone	*Left*	*Right*
Humerus	2	
Radius		
Ulna		2
Femur		2
Tibia		2
Fibula	–	–
Clavicle	–	–
Scapula	–	–
Temporal	1	2
Maxilla	–	–
Mandible	1	1
Rib	–	
Vertebra	–	
Sternum	–	
Ilium	–	–
Ischium	–	–
Pubis	–	1
Patella	–	–
Calcaneus	–	–
Talus	–	–
Carpals and tarsals	–	

TABLE A61.—Feature 16

Bone	*Left*	*Right*
Humerus	1	2
Radius	–	2
Ulna	–	1
Femur	2	2
Tibia	1	–
Fibula	1	1
Clavicle	1	1
Scapula	2	1
Temporal	–	–
Maxilla	1	1
Mandible	1	1
Rib	1(7)	
Vertebra	1(22)	
Sternum	1	
Ilium	1	1
Ischium	2	1
Pubis	1	2
Patella	–	
Calcaneus	1	1
Talus	–	1
Carpals and tarsals	1(12)	

TABLE A62.—Feature 17

Bone	*Left*	*Right*
Humerus	4	2
Radius	2	1
Ulna	4	3
Femur	4	5
Tibia	4	4
Fibula	3(5)	–
Clavicle	–	2
Scapula	3	1
Temporal	7	6
Maxilla	1	3
Mandible	4	3
Rib	2(27)	
Vertebra	2(38)	
Sternum	–	
Ilium	1	3
Ischium	1	2
Pubis	–	1
Patella	–	–
Calcaneus	1	–
Talus	1	–
Carpals and tarsals	1(28)	

TABLE A63.—Feature 18

Bone	*Left*		*Right*
Humerus	3		3
Radius		3(5)	
Ulna	4		1
Femur	2	3(6)	3
Tibia	3	2(4)	1
Fibula	–	1(1)	–
Clavicle	1		1
Scapula	–		1
Temporal	5		6
Maxilla	–		2
Mandible	2		2
Rib		1(14)	
Vertebra		1(18)	
Sternum		–	
Ilium	1		2
Ischium	1		–
Pubis	1		1
Patella			–
Calcaneus			
Talus			
Carpals and tarsals		1(7)	

TABLE A64.—Feature 20

Bone	*Left*		*Right*
Humerus	1		1
Radius	1		1
Ulna	1		1
Femur	1		1
Tibia	1		1
Fibula	1		1
Clavicle	1		1
Scapula	1		
Temporal	1		1
Maxilla	1		1
Mandible	1		1
Rib		1(24)	
Vertebra		1(25)	
Sternum		1	
Ilium	1		1
Ischium	1		1
Pubis	1		1
Patella			–
Calcaneus	1		–
Talus		1(1)	–
Carpals and tarsals		1(15)	

TABLE A65.—Feature 21

Bone	*Left*		*Right*
Humerus	6		6
Radius	4		2
Ulna	5		3
Femur	7		7
Tibia	3		3
Fibula		1(1)	–
Clavicle	2		3
Scapula	6		5
Temporal	10		9
Maxilla	6		5
Mandible	11		11
Rib		2(31)	
Vertebra		3(75)	
Sternum		2	
Ilium	2		5
Ischium	4		2
Pubis	2		2
Patella	–		–
Calcaneus	1		–
Talus	1		–
Carpals and tarsals		1(18)	

TABLE A66.—Feature 22

Bone	*Left*		*Right*
Humerus	10		6
Radius	1		5
Ulna	4		7
Femur	8		10
Tibia	6		5
Fibula	–	2(3)	–
Clavicle	–		–
Scapula	–		2
Temporal	12		12
Maxilla	2		2
Mandible	5		5
Rib		1(14)	
Vertebra		1(20)	
Sternum		–	
Ilium	6		2
Ischium	3		1
Pubis	–		3
Patella	–		
Calcaneus	–		
Talus	–		
Carpals and tarsals		1(1)	

TABLE A67.—Feature 23

Bone	*Left*		*Right*
Humerus	4		4
Radius	2		3
Ulna	3		3
Femur	3		3
Tibia	3		3
Fibula	–	2(4)	–
Clavicle	2		3
Scapula	2		3
Temporal	2		2
Maxilla	3		2
Mandible	3		4
Rib		1(13)	
Vertebra		3(64)	
Sternum		1	
Ilium	3		4
Ischium	3		2
Pubis	1		4
Patella	1		
Calcaneus	2		2
Talus	1		3
Carpals and tarsals		1(39)	

TABLE A68.—Feature 24

Bone	*Left*		*Right*
Humerus	8		7
Radius	6		3
Ulna	4		5
Femur	6		7
Tibia	5		6
Fibula	–	5(9)	
Clavicle	5		4
Scapula	7		6
Temporal	7		7
Maxilla	3		4
Mandible	5		5
Rib		4(76)	
Vertebra		4(82)	
Sternum			
Ilium	5		7
Ischium	4		4
Pubis	2		3
Patella			–
Calcaneus			–
Talus	–		–
Carpals and tarsals		1(10)	

TABLE A69.—Feature 25

Bone	*Left*	*Right*
Humerus	9	10
Radius	3	5
Ulna	5	6
Femur	13	13
Tibia	6	6
Fibula	–	3(7) –
Clavicle	4	4
Scapula	5	6
Temporal	11	13
Maxilla	5	4
Mandible	8	9
Rib	1(15)	
Vertebra	2(47)	
Sternum	1	
Ilium	8	7
Ischium	3	3
Pubis	2	2
Patella		
Calcaneus	3	2
Talus	1	
Carpals and tarsals	1(47)	

TABLE A70.—Feature 26

Bone	*Left*	*Right*
Humerus	1	–
Radius	2	2
Ulna	1	–
Femur	2	2
Tibia		–
Fibula	–	
Clavicle	–	
Scapula	2	
Temporal	3	3
Maxilla	–	
Mandible	2	2
Rib	1(9)	
Vertebra	–	
Sternum	–	
Ilium	1	1
Ischium	–	–
Pubis	–	–
Patella	–	–
Calcaneus	–	–
Talus	–	–
Carpals and tarsals	1(1)	

TABLE A71.—Feature 27

Bone	*Left*	*Right*
Humerus	3	3
Radius	–	1
Ulna	3	2
Femur	4	3
Tibia	2	3
Fibula	1(1)	–
Clavicle	–	–
Scapula	1	1
Temporal	3	3
Maxilla	–	
Mandible	2	
Rib	2(27)	
Vertebra	1(14)	
Sternum	–	
Ilium	1	1
Ischium	–	1
Pubis	–	1
Patella	–	–
Calcaneus	–	–
Talus	–	–
Carpals and tarsals	1(7)	

TABLE A72.—Feature 30, between urn and covering

Bone	*Left*	*Right*
Humerus		–
Radius	1	1
Ulna	1	–
Femur		1
Tibia		1
Fibula	1(1)	–
Clavicle	–	–
Scapula	–	–
Temporal	–	–
Maxilla	–	–
Mandible	–	–
Rib	1(1)	
Vertebra	1(8)	
Sternum	–	
Ilium	–	–
Ischium	–	–
Pubis	–	–
Patella	–	–
Calcaneus	–	1
Talus		
Carpals and tarsals	1(11)	

TABLE A73.—Entire feature 30

Bone	*Left*	*Right*
Humerus	6	4
Radius	4	3
Ulna	5	6
Femur	4 1(1)	5
Tibia	5	4
Fibula	7	8
Clavicle	4	4
Scapula	5	3
Temporal	7	4
Maxilla	5	4
Mandible	3	5
Rib	2(36)	
Vertebra	3(57)	
Sternum	2	
Ilium	4	3
Ischium	3	3
Pubis	2	3
Patella	–	1
Calcaneus	1	2
Talus	– 1(1)	–
Carpals and tarsals	1(54)	

TABLE A74.—Feature 34

Bone	*Left*	*Right*
Humerus	–	
Radius	1	
Ulna	–	–
Femur	1	1
Tibia	1	
Fibula	1	
Clavicle	–	–
Scapula	–	–
Temporal	1	–
Maxilla	–	–
Mandible	1	–
Rib	1(2)	
Vertebra	1(3)	
Sternum	–	
Ilium	1	1
Ischium	–	–
Pubis	–	–
Patella	–	
Calcaneus	–	–
Talus		–
Carpals and tarsals	–	

TABLE A75.—Feature 35

Bone	*Left*		*Right*
Humerus	2		2
Radius	2		2
Ulna	2		2
Femur	2		2
Tibia	2		2
Fibula	1	1(1)	1
Clavicle	2		1
Scapula	2		2
Temporal	2		1
Maxilla	1		1
Mandible	1		2
Rib		2(25)	
Vertebra		2(38)	
Sternum		–	
Ilium	2		2
Ischium	2		2
Pubis	–		–
Patella	–		–
Calcaneus	–		–
Talus			–
Carpals and tarsals		1(7)	

TABLE A76.—Feature 36

Bone	*Left*		*Right*
Humerus	3		3
Radius	1		2
Ulna	1		3
Femur	3		2
Tibia	2		3
Fibula	1	1(2)	1
Clavicle	1		1
Scapula	2		2
Temporal	2		2
Maxilla	–		
Mandible	1		1
Rib		2(42)	
Vertebra		2(31)	
Sternum		–	
Ilium	2		3
Ischium	3		1
Pubis	2		2
Patella	1		1
Calcaneus	1		1
Talus	1		1
Carpals and tarsals		1(43)	

TABLE A77.—Feature 37B

Bone	*Left*		*Right*
Humerus	–	1(1)	–
Radius	–	1(1)	–
Ulna		1(1)	–
Femur	1		1
Tibia	1		1
Fibula	1		1
Clavicle			1
Scapula			–
Temporal	2		1
Maxilla	–		–
Mandible	1		1
Rib		1(15)	
Vertebra		1(6)	
Sternum		–	
Ilium	–		–
Ischium	–		–
Pubis	–		–
Patella	–		–
Calcaneus	–		–
Talus	–		–
Carpals and tarsals		1(10)	

TABLE A78.—Feature 37C

Bone	*Left*		*Right*
Humerus	–		1
Radius	–		1
Ulna	1		
Femur	–		1
Tibia	–		1
Fibula	–		
Clavicle	–		
Scapula	–		
Temporal	1		1
Maxilla			–
Mandible			–
Rib		1(5)	
Vertebra		1(4)	
Sternum		–	
Ilium	–		–
Ischium	–		–
Pubis	–		–
Patella	–		–
Calcaneus	–		–
Talus	–		
Carpals and tarsals		–	

TABLE A79.—Feature 37D–E

Bone	*Left*		*Right*
Humerus	2		1
Radius	–		–
Ulna	–		3
Femur	2		3
Tibia	–		1
Fibula			–
Clavicle	1		–
Scapula	–		–
Temporal	–		2
Maxilla	–		–
Mandible	–		–
Rib		1(3)	
Vertebra		1(1)	
Sternum		–	
Ilium	–		
Ischium	–		
Pubis	–		
Patella	–		–
Calcaneus	–		
Talus	–		
Carpals and tarsals		–	

TABLE A80.—Entire feature 37

Bone	*Left*		*Right*
Humerus	2	1(1)	2
Radius	–	1(1)	1
Ulna	1	1(1)	3
Femur	3		5
Tibia	1		3
Fibula	1		1
Clavicle	1		1
Scapula	–		
Temporal	3		4
Maxilla			–
Mandible	1		1
Rib		1(23)	
Vertebra		1(11)	
Sternum		–	
Ilium	–		
Ischium	–		–
Pubis	–		–
Patella	–		
Calcaneus	–		
Talus	–		
Carpals and tarsals		1(10)	

TABLE A81.—Feature 48

Bone	*Left*		*Right*
Humerus	2		2
Radius	1		1
Ulna	1		1
Femur	2		2
Tibia	1	1(2)	1
Fibula			
Clavicle	1		
Scapula	2		1
Temporal	2		2
Maxilla	–		
Mandible	1		1
Rib		1(10)	
Vertebra		1(17)	
Sternum			
Ilium	1		2
Ischium	–		2
Pubis	–		1
Patella			
Calcaneus	–		
Talus	–		
Carpals and tarsals		1(5)	

TABLE A82.—Feature 50

Bone	*Left*		*Right*
Humerus	4		4
Radius	3		3
Ulna	2		4
Femur	5		4
Tibia	4		4
Fibula	–	4(8)	
Clavicle	3		4
Scapula	3		3
Temporal	5		4
Maxilla	3		4
Mandible	4		4
Rib		3(56)	
Vertebra		4(81)	
Sternum		–	
Ilium	5		3
Ischium	3		3
Pubis	3		4
Patella	–		–
Calcaneus	2		2
Talus	2		1
Carpals and tarsals		1(33)	

TABLE A83.—Feature 51

Bone	*Left*		*Right*
Humerus	3		2
Radius	2		2
Ulna	2		2
Femur	3		3
Tibia	3		2
Fibula		3(6)	
Clavicle	1		2
Scapula	3		1
Temporal	3		3
Maxilla	3		3
Mandible	3		3
Rib		3(56)	
Vertebra		2(35)	
Sternum		2	
Ilium	3		3
Ischium	–		–
Pubis	–		–
Patella	2		–
Calcaneus	–		–
Talus	–		
Carpals and tarsals		1(43)	

TABLE A84.—Feature 52

Bone	*Left*		*Right*
Humerus	2		3
Radius	2		2
Ulna	2		2
Femur	1		2
Tibia	2		2
Fibula	1		1
Clavicle	1		–
Scapula	1		–
Temporal	2		3
Maxilla	1		1
Mandible	1		2
Rib		1(4)	
Vertebra		1(24)	
Sternum		1	
Ilium	1		2
Ischium	–		–
Pubis	–		–
Patella	–		–
Calcaneus	–		–
Talus	–		–
Carpals and tarsals		1(29)	

TABLE A85.—Feature 53

Bone	*Left*		*Right*
Humerus	3		3
Radius	–		–
Ulna	1		2
Femur	3		5
Tibia	5		2
Fibula	1	2(3)	1
Clavicle	2		–
Scapula	–		1
Temporal	3		5
Maxilla	1		–
Mandible	2		2
Rib		1(10)	
Vertebra		2(30)	
Sternum		1	
Ilium	3		2
Ischium	–		–
Pubis	–		–
Patella			–
Calcaneus			–
Talus			–
Carpals and tarsals		1(8)	

TABLE A86.—Feature 56

Bone	*Left*		*Right*
Humerus	4		3
Radius	2		2
Ulna	2		1
Femur	3		4
Tibia	3		3
Fibula	–	2(3)	–
Clavicle	2		1
Scapula	1		–
Temporal	5		4
Maxilla	5		2
Mandible	4		4
Rib		2(28)	
Vertebra		2(28)	
Sternum		–	
Ilium	1		–
Ischium	1		–
Pubis	–		–
Patella	–		–
Calcaneus	–		–
Talus	–		
Carpals and tarsals		1(6)	

TABLE A87.—Feature 57, articulated infant

Bone	*Left*	*Right*
Humerus	1	–
Radius	–	–
Ulna	–	–
Femur	1	1
Tibia	1	1
Fibula	–	
Clavicle	1	1
Scapula	–	
Temporal	1	1
Maxilla	1	1
Mandible	1	1
Rib	1(9)	
Vertebra	1(14)	
Sternum	–	
Ilium	1	1
Ischium	–	–
Pubis	–	–
Patella	–	–
Calcaneus	–	–
Talus	–	–
Carpals and tarsals	–	

TABLE A88.—Feature 58, near surface

Bone	*Left*	*Right*
Humerus	–	–
Radius	–	–
Ulna	–	–
Femur	1	–
Tibia	–	
Fibula	–	–
Clavicle	–	–
Scapula	–	–
Temporal	–	
Maxilla	–	
Mandible	–	
Rib	1(1)	
Vertebra	–	
Sternum	–	
Ilium	–	
Ischium	–	
Pubis	–	
Patella	–	–
Calcaneus	–	
Talus	–	
Carpals and tarsals	–	

TABLE A89.—Feature 58, within upper urn

Bone	*Left*	*Right*
Humerus		1
Radius		–
Ulna	–	–
Femur	–	2
Tibia	1	1
Fibula	– 1(1)	–
Clavicle	– 1(1)	–
Scapula	–	–
Temporal	–	1
Maxilla	–	–
Mandible		–
Rib	–	
Vertebra	1(3)	
Sternum	–	
Ilium	2	–
Ischium	–	–
Pubis	–	–
Patella	–	–
Calcaneus	–	–
Talus	–	–
Carpals and tarsals	–	

TABLE A90.—Feature 58, within lower urn

Bone	*Left*	*Right*
Humerus	3	3
Radius	3	2
Ulna	2	1
Femur	3	3
Tibia	2	2
Fibula	– 2(4)	–
Clavicle	3	2
Scapula	2	1
Temporal	1	1
Maxilla	–	1
Mandible	1	1
Rib	1(21)	
Vertebra	2(47)	
Sternum	2	
Ilium	–	2
Ischium	2	3
Pubis	2	2
Patella		–
Calcaneus	1	1
Talus	1	1
Carpals and tarsals	1(42)	

TABLE A91.—Entire feature 58

Bone	*Left*	*Right*
Humerus	3	3
Radius	3	2
Ulna	2	1
Femur	3	3
Tibia	3	3
Fibula	– 2(4)	
Clavicle	3 1(1)	2
Scapula	2	1
Temporal	1	2
Maxilla		1
Mandible	1	1
Rib	1(22)	
Vertebra	2(50)	
Sternum	2	
Ilium	2	2
Ischium	2	3
Pubis	2	2
Patella		–
Calcaneus	1	1
Talus	1	1
Carpals and tarsals	1(42)	

TABLE A92.—Feature 60, upper layer

Bone	*Left*	*Right*
Humerus	1	2
Radius	1	1
Ulna		2
Femur	5	4
Tibia	2	–
Fibula	–	–
Clavicle	1	–
Scapula	–	2
Temporal	5	5
Maxilla	1	1
Mandible	1	2
Rib	1(9)	
Vertebra	1(9)	
Sternum	–	
Ilium	1	–
Ischium	–	–
Pubis	–	–
Patella	–	–
Calcaneus	–	–
Talus	–	–
Carpals and tarsals		

TABLE A93.—Feature 60, middle layer

Bone	*Left*	*Right*
Humerus	2	1
Radius	–	–
Ulna	1	1
Femur	4	6
Tibia	3	4
Fibula	– 1(1)	–
Clavicle	–	–
Scapula	–	–
Temporal	1	5
Maxilla	1	1
Mandible	4	2
Rib	1(3)	
Vertebra	1(16)	
Sternum	–	
Ilium	1	3
Ischium	–	
Pubis	–	
Patella	–	–
Calcaneus	–	
Talus	–	
Carpals and tarsals	1(2)	

TABLE A94.—Feature 60, lower layer

Bone	*Left*	*Right*
Humerus	1	2
Radius	1	1
Ulna	2	1
Femur	1	3
Tibia		2
Fibula	2(4)	–
Clavicle	1	
Scapula	4	1
Temporal	3	3
Maxilla		2
Mandible	1	2
Rib	1(18)	
Vertebra	1(2)	
Sternum		
Ilium	2	1
Ischium	1	
Pubis	–	
Patella	–	
Calcaneus	–	–
Talus	–	–
Carpals and tarsals	1(1)	

TABLE A95.—Entire feature 60

Bone	*Left*	*Right*
Humerus	4	5
Radius	2	2
Ulna	3	4
Femur	10	13
Tibia	5	6
Fibula	– 3(5)	–
Clavicle	2	–
Scapula	4	3
Temporal	9	13
Maxilla	2	4
Mandible	6	6
Rib	1(21)	
Vertebra	2(26)	
Sternum	–	
Ilium	4	4
Ischium	1	–
Pubis		–
Patella	–	–
Calcaneus		–
Talus		–
Carpals and tarsals	1(3)	

TABLE A96.—Feature 61

Bone	*Left*	*Right*
Humerus	8	5
Radius	4	2
Ulna	4	5
Femur	8	10
Tibia	5	5
Fibula	– 2(3)	–
Clavicle	4	3
Scapula	6	6
Temporal	6	6
Maxilla	1	3
Mandible	3	7
Rib	2(38)	
Vertebra	2(34)	
Sternum	–	
Ilium	4	2
Ischium	3	3
Pubis	1	1
Patella	–	–
Calcaneus	–	–
Talus	–	–
Carpals and tarsals	1(8)	

TABLE A97.—Feature 62

Bone	*Left*	*Right*
Humerus	1	1
Radius	–	1
Ulna	–	–
Femur	1	1
Tibia	1	1
Fibula	1	1
Clavicle	1	1
Scapula	1	1
Temporal	1	1
Maxilla	1	1
Mandible	1	1
Rib	1(19)	
Vertebra	1(23)	
Sternum	1	
Ilium	1	1
Ischium		–
Pubis		–
Patella		–
Calcaneus		–
Talus	–	
Carpals and tarsals	1(11)	

TABLE A98.—Feature 69

Bone	*Left*	*Right*
Humerus	1	1
Radius	1	
Ulna	–	
Femur	2	3
Tibia	1	2
Fibula	– 1(2)	
Clavicle	–	1
Scapula	–	
Temporal	3	3
Maxilla	2	2
Mandible	3	2
Rib	1(3)	
Vertebra	1(1)	
Sternum	2	
Ilium	–	–
Ischium	–	–
Pubis	–	–
Patella	–	–
Calcaneus	–	–
Talus	–	–
Carpals and tarsals	–	

TABLE A99.—Feature 75

Bone	*Left*		*Right*
Humerus	–		1
Radius	1		–
Ulna	1		1
Femur	1		2
Tibia	–		–
Fibula	–	1(2)	–
Clavicle	–		1
Scapula	–		1
Temporal	–		2
Maxilla	–		–
Mandible	–		–
Rib		1(8)	
Vertebra		1(5)	
Sternum			
Ilium	–		–
Ischium	–		–
Pubis	–		1
Patella			–
Calcaneus			–
Talus			–
Carpals and tarsals		1(6)	

TABLE A100.—Feature 76

Bone	*Left*		*Right*
Humerus	1		1
Radius	1		1
Ulna	1		1
Femur	1		1
Tibia	–		–
Fibula			1
Clavicle			–
Scapula			–
Temporal	–		–
Maxilla	–		–
Mandible	1		1
Rib		1(9)	
Vertebra		1(9)	
Sternum		–	
Ilium	–		
Ischium	–		
Pubis	–		
Patella	–		
Calcaneus	–		
Talus	–		–
Carpals and tarsals		1(5)	

TABLE A101.—Feature 77

Bone	*Left*		*Right*
Humerus			
Radius	1		1
Ulna			1
Femur	1		1
Tibia	2		2
Fibula		1(2)	–
Clavicle			–
Scapula	–		–
Temporal	1		–
Maxilla			
Mandible	1		1
Rib		1(9)	
Vertebra		1(10)	
Sternum		–	
Ilium	–		–
Ischium	1		2
Pubis	–		–
Patella	–		–
Calcaneus	–		–
Talus	–		–
Carpals and tarsals		–	

TABLE A102.—All urn features

Bone	*Left*		*Right*
Humerus	111		98
Radius	57	3	53
Ulna	71		76
Femur	122	5	140
Tibia	88	3	85
Fibula	10	41	9
Clavicle	50	1	47
Scapula	65		59
Temporal	128		133
Maxilla	58		59
Mandible	95	1	95
Rib		27	
Vertebra		41	
Sternum		21	
Ilium	73		73
Ischium	41		38
Pubis	22		42
Patella	3		1
Calcaneus	18		14
Talus	9	1	7
Carpals and tarsals		5	

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